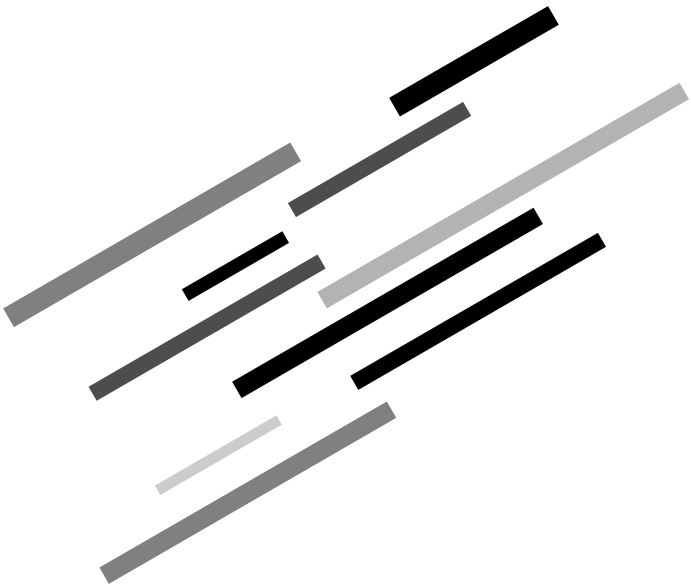
CS400/300

COLOR IMAGE SCANNER

USER'S MANUAL

MANUAL NO. CS400-UM-152



GRAPHTEC

TO ENSURE SAFE AND CORRECT USE

- To ensure safe and correct use of your Image Scanner, read this Manual thoroughly before use.
- After having read this Manual, keep it in a handy location for quick reference as needed.
- Do not permit small children to touch the Image Scanner.
- The following describes important points for safe operation. Please be sure to observe them strictly.

■ Conventions Used in This Manual

To promote safe and accurate use of the Image Scanner as well as to prevent human injury and property damage, safety precautions provided in this manual are ranked into the three categories described below. Be sure you understand the difference between each of the categories.

⚠DANGER : This category provides information that, if ignored, is highly likely to cause fatal or serious injury to the operator.

⚠WARNING : This category provides information that, if ignored, is likely to cause fatal or serious injury to the operator.

⚠CAUTION : This category provides information that, if ignored, could cause injury to the operator or physical damage to the Image Scanner.

■ Description of Safety Symbols

The ⚠ symbol indicates information that requires careful attention (which includes warnings). The point requiring attention is described by an illustration or text within or next to the ⚠ symbol.

The ⃠ symbol indicates action that is prohibited. Such prohibited action is described by an illustration or text within or next to the ⃠ symbol.

The ❗ symbol indicates imperative action (that must be performed). Such imperative action is described by an illustration or text within or next to the ❗ symbol.

Safety Precautions

⚠ WARNING

Do not disassemble, repair, or remodel this scanner.

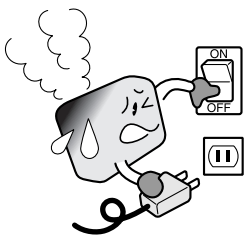
- Such action may cause a fire hazard or electrical shock.
- Such action could impair the scanner's performance and cause it to malfunction or break down.

No disassembly

If the scanner generates smoke, is abnormally hot, emits a strange odor, or otherwise functions abnormally, do not continue using it. Turn off its power and unplug its power cord from the electrical socket.

- Use of the scanner in such status may result in a fire hazard or electrical shock.
- Request repair by contacting your sales representative or nearest Graphtec vendor.
- Never try to perform repair yourself. Repair work by inexperienced personnel is extremely dangerous.

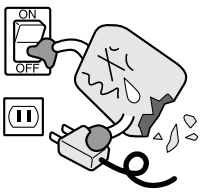
Unplug the power cord from the socket



If the scanner is damaged from being dropped or other impact, turn off its power and unplug its power cord from the electrical socket.

- Use of the scanner in such status may result in a fire hazard or electrical shock.
- Request repair by contacting your sales representative or nearest Graphtec vendor.
- Never try to perform repair yourself. Repair work by inexperienced personnel is extremely dangerous.

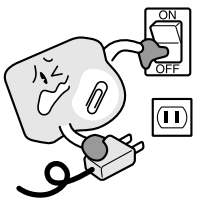
Unplug the power cord from the socket



If water or foreign matter enters the scanner, turn off its power and unplug its power cord from the electrical socket.

- Use of the scanner in such status may result in a fire hazard or electrical shock.
- Request repair by contacting your sales representative or nearest Graphtec vendor.
- Never try to perform repair yourself. Repair work by inexperienced personnel is extremely dangerous.

Unplug the power cord from the socket

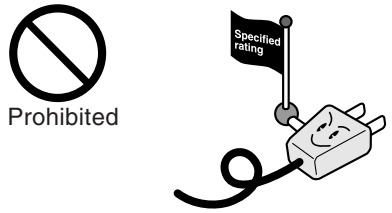


Safety Precautions (Continued)

⚠ WARNING

Do not connect the scanner to a non-rated power supply.

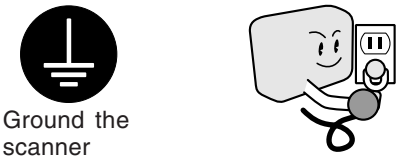
- Use of a different supply voltage may result in a fire hazard or electrical shock.



⚠ CAUTION

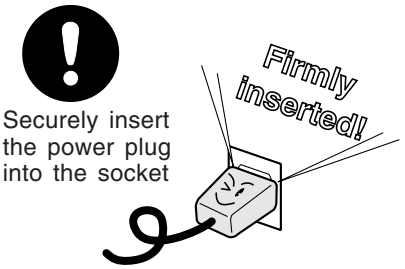
Be sure to ground the earth terminal.

- Unless the scanner is grounded, the operator could suffer an electrical shock in case of current leakage.



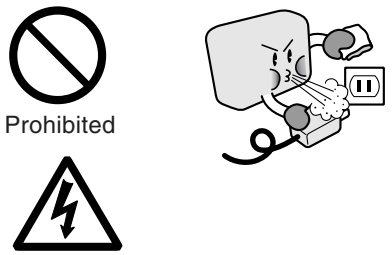
Insert the scanner's power plug securely into the electrical socket.

- After first connecting the power cord's female plug to the scanner, connect its male plug to the electrical socket.
- Using the scanner with its power plug incompletely inserted into the electrical socket could cause a fire hazard or electrical shock.



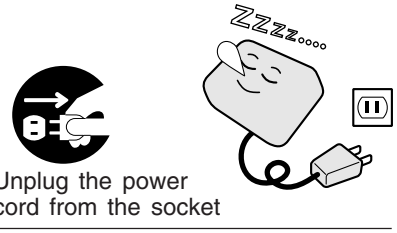
Do not allow dust or metallic matter to adhere to the power cord's plug.

- If the power cord's plugs become dirty, thoroughly wipe them clean.
- The use of a dirty power cord plug could result in a fire hazard or electrical shock.



When the scanner will not be used for an extended period, unplug its power cord from the electrical socket.

- Leaving the scanner connected to a power supply increases its risk of short-circuiting and overheating.



Safety Precautions (Continued)

⚠ CAUTION

Be careful not to damage the power cord or the interface cable and never use a damaged cord or cable.

- Do not use unnecessary force to bend, pull, twist, or bind the cord and cable, place a heavy object on them, nor remodel them. Such actions could result in scratches or damage to the cord or cable.
- Use of a damaged power cord or interface cable may result in electrical shock or a fire hazard.
- Replace the damaged cord or cable with a new one.

Never damage or use when damaged

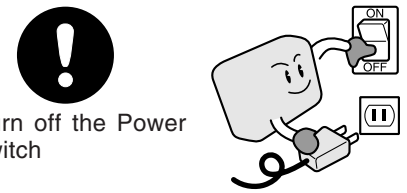
When disconnecting the power cord or the interface cable, do not pull on the cord/cable.

- Such action will damage the cord/cable, resulting in a fire hazard or electrical shock. Be sure to hold the power cord's plug or the interface cable's connector.

Pulling prohibited

Before disconnecting or reconnecting the power cord, be sure to turn off the scanner.

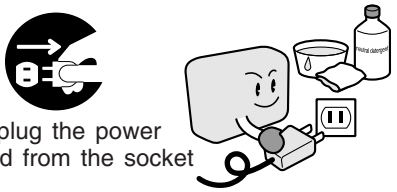
- Failure to do so may damage the scanner's performance and cause it to malfunction or break down.
- Failure to do so may result in electrical shock.



Turn off the Power switch

Before cleaning the scanner, be sure to unplug its power cord from the electrical socket.

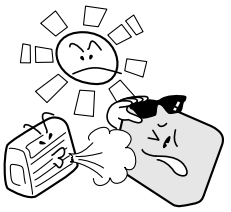
- Failure to do so may result in electrical shock.



Unplug the power cord from the socket

Do not install, use, or store the scanner in a location exposed to direct sunlight and/or the direct draft of an air conditioner or heater.

- Such location may impair the scanner's performance due to deformation or other damage and cause the scanner to malfunction or break down.



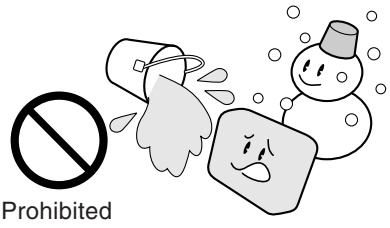
Prohibited

Safety Precautions (Continued)

⚠ CAUTION

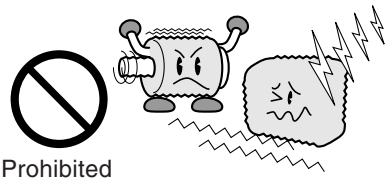
Do not install, use, or store the scanner in a location that does not meet the specified temperature and humidity ranges.

- Such location may impair the scanner's performance and cause the scanner to malfunction or break down.



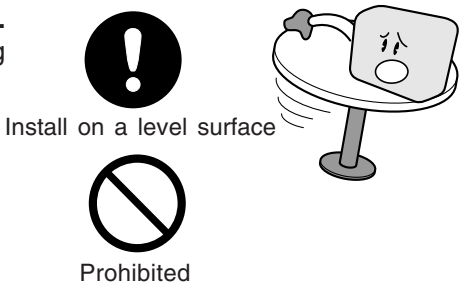
Do not install, use, or store the scanner in a location subject to excessive mechanical vibration or electrical noise.

- Such location may impair the scanner's performance and cause the scanner to malfunction or break down.



Do not install the scanner on an unstable surface.

- The scanner could break due to impact from falling from the surface or cause injury to the operator.

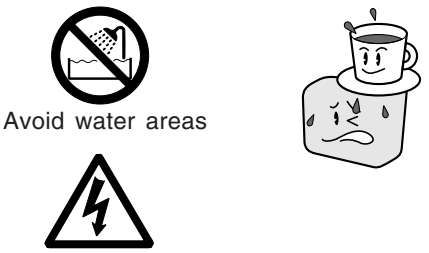


While the scanner is operating (reading or ejecting a document), keep hands, clothing, and other objects away from the document.

- Injury could result from an object getting tangled in the scanner's rollers.

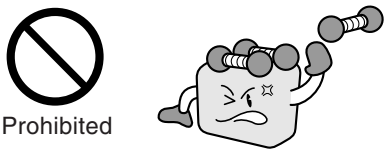
Do not place any receptacle containing water or other fluid on top of the scanner.

- Fluid falling inside the scanner may cause a fire hazard or electrical shock due to a short circuit or overheating.



Do not place heavy objects on the scanner.

- Such action may impair the scanner's performance due to deformation or other damage, and cause the scanner to malfunction or break down.

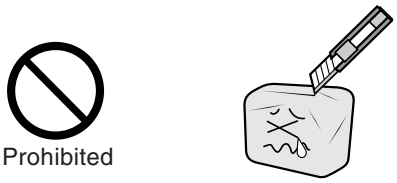


Safety Precautions (Continued)

⚠ CAUTION

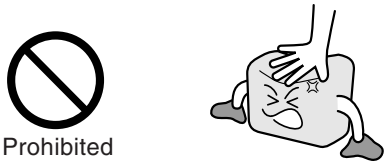
Do not use sharp, pointed articles on the scanner.

- Such action may impair the scanner's performance and cause the scanner to malfunction or break down.



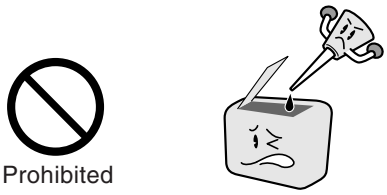
Do not exert pressure on the scanner.

- Such action may impair the scanner's performance and cause the scanner to malfunction or break down.
- Such action could cause injury to the operator.



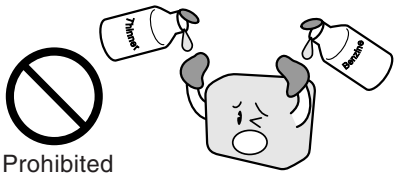
Do not attempt to lubricate the scanner's mechanisms.

- Such action may impair the scanner's performance and cause the scanner to malfunction or break down.
- Such action may cause a fire hazard or electrical shock due to a short circuit or overheating.



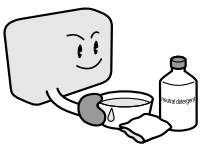
Do not clean the scanner using a volatile solvent such as thinner or benzine.

- Such action may impair the scanner's performance and cause the scanner to malfunction or break down.



Clean off the scanner's soiled areas using a soft cloth that has been moistened with water or a neutral detergent (diluted with water) and then firmly wrung out, then wipe the scanner using a dry cloth.

For more details, see Chapter 5, "Daily Maintenance."



INTRODUCTION

Thank you for purchasing the CS400/300 Image Scanner. The CS400/300 is capable of accurately performing high-speed scanning of documents ranging in size from ISO A4 to ANSI E.
This User's Manual describes how to operate the CS400/300, and also includes usage precautions. Read the manual thoroughly prior to use in order to ensure full understanding of the product's features, and to ensure effective use. Keep the manual in a safe place where it can be accessed easily whenever necessary.

Items in this manual marked ⚠ are precautions to ensure safe use. Please be sure to observe them strictly.

Notes Regarding This Manual

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- The specifications and other information in this manual are subject to change without notice.
- While every effort has been made to provide complete and accurate information, please contact your sales representative or nearest Graphtec vendor if you find any unclear or mistaken information or have other comments or suggestions.
- Notwithstanding the stipulation in the preceding paragraph, Graphtec Corporation assumes no liability for damages resulting from either the use of the information contained herein or from use of the product.
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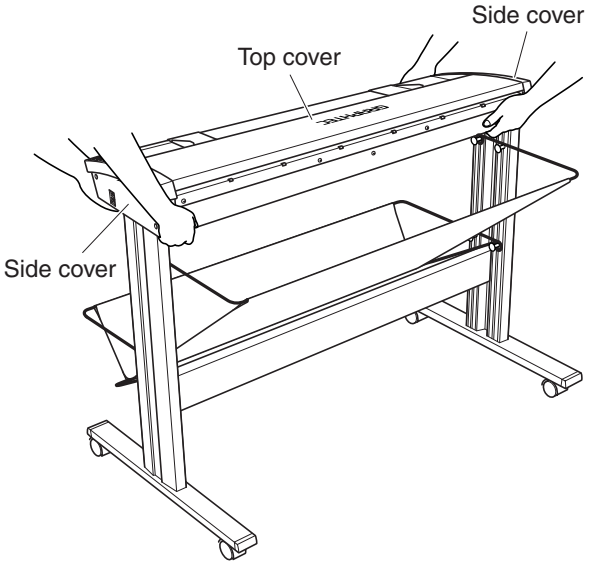
Trademarks

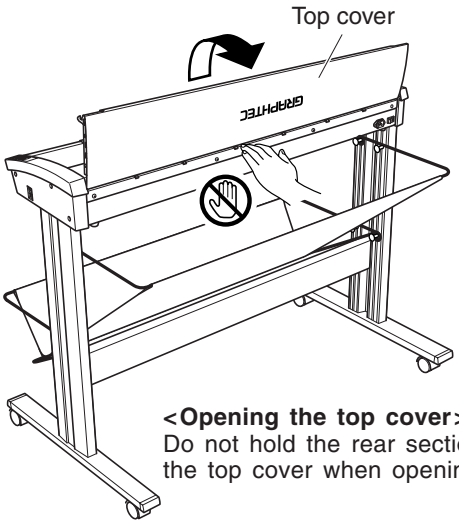
Windows is a U.S. registered trademark of Microsoft Corp. Other product names mentioned herein are trademarks or registered trademarks of their respective owners.

Usage precautions

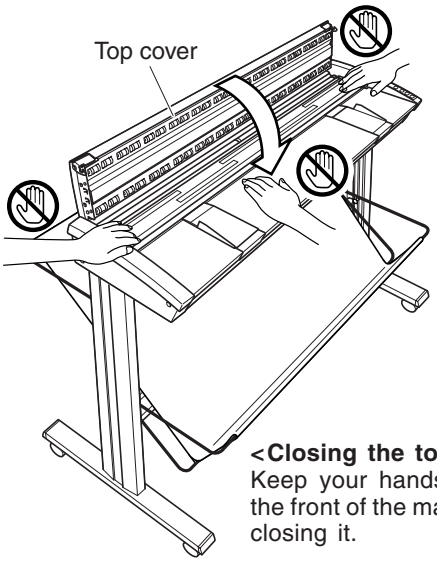
Do not lift or move the unit by holding the top cover, as doing so may damage the unit. Always lift the unit by holding the underside.



Take care to prevent your fingers from being caught in the gap between the top cover and the scanner unit when opening and closing the top cover.



<Opening the top cover>
Do not hold the rear section of the top cover when opening it.



<Closing the top cover>
Keep your hands away from the front of the main unit when closing it.

Always ensure that you open the top cover and remove the cushion material before using the product. (Refer to Section 5.1, “Opening and Closing the Top Cover”.)

Scanner Warm-up

A warm-up period is not usually required for the CS400/300. However, if you plan to scan a color document (in particular a document with many light colors), we recommend that you allow the CS400/300 to warm up for 10 minutes before scanning the document.

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1. OVERVIEW

1.1 Features

- **600-dpi optical resolution for high-precision image scanning**

  Scanning with an optical resolution of 600 dpi allows even complex and difficult-to-scan documents, such as CAD drawings, electronic files, and mapping data to be scanned rapidly and with high precision. Scanning Master 21+ (scanner software included as a standard accessory) can be used to adjust the resolution in five levels (50 dpi to 800 dpi, in 1-dpi increments) to suit the scanned document.

- **Compatible document widths range from 210 mm to 1016 mm**

  Compatible with document sizes from ISO A4 up to ANSI E

- **Capable of color and grayscale scanning**

  Capable of scanning in color (24-bit color*, 8-bit color) or grayscale (256 shades)
  * CS400 only

- **Capable of reading long-axis data**

  Scanning of long-axis images is supported.

- **Compact and lightweight design**

  A compact design was achieved by using a document travel system that employs contact image sensors in the sensor unit (five rows arranged in a zigzag pattern).

- **Image-processing functions**

  Use of the scanning software provided lets you set image-processing functions for the scanning of a document.

- **Interface**

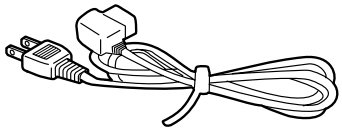
  USB 2.0, IEEE 1394

1.2 Unpacking the Scanner

After unpacking the Image Scanner, check its outer casing and check that the standard accessories listed below are all present. If you detect a surface flaw or a missing accessory, please promptly contact your sales representative or nearest Graphtec vendor.

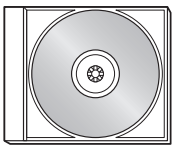
Standard Accessories

Power cable 1



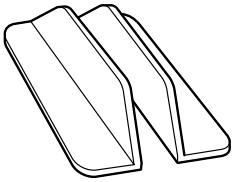
User's Manual 1

Software CD-ROM 1

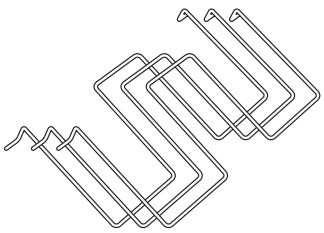


• Scanning Master 21+

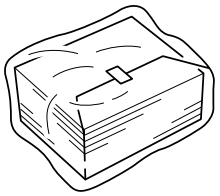
Document guides (CS300 only) 2



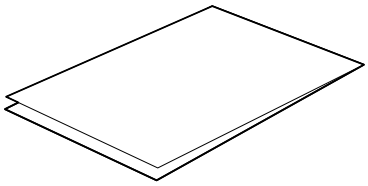
Document support wires 3



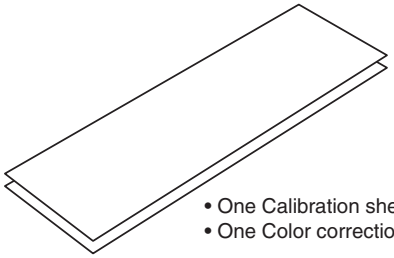
Cleaning paper 1 pack



Carrier sheet IS0907 1



Calibration/Color correction sheets 1 set



• One Calibration sheet
• One Color correction sheet

2. PREPARATION

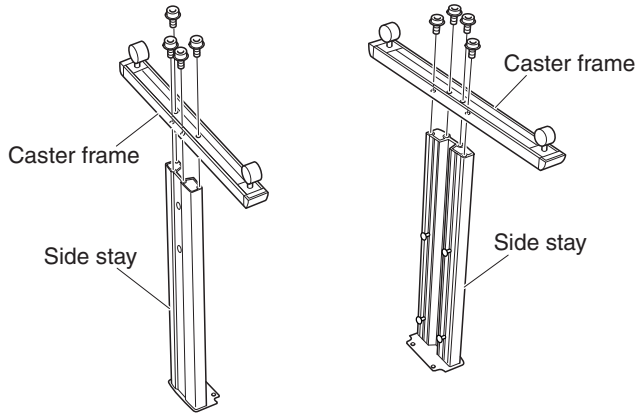
2.1 Assembling the Scanner

CAUTION

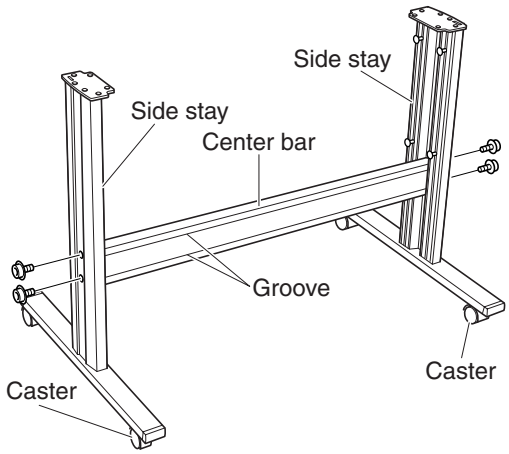
Two persons are required for the assembly operation.

Assemble the stand before mounting the scanner unit.

(1) Assemble the caster frame and the side stay using the four screws provided. (It is not necessary to distinguish between the left side and the right side stay because both stays have the same shape.)



(2) Attach the center bar to the side stays temporarily using the four screws provided.



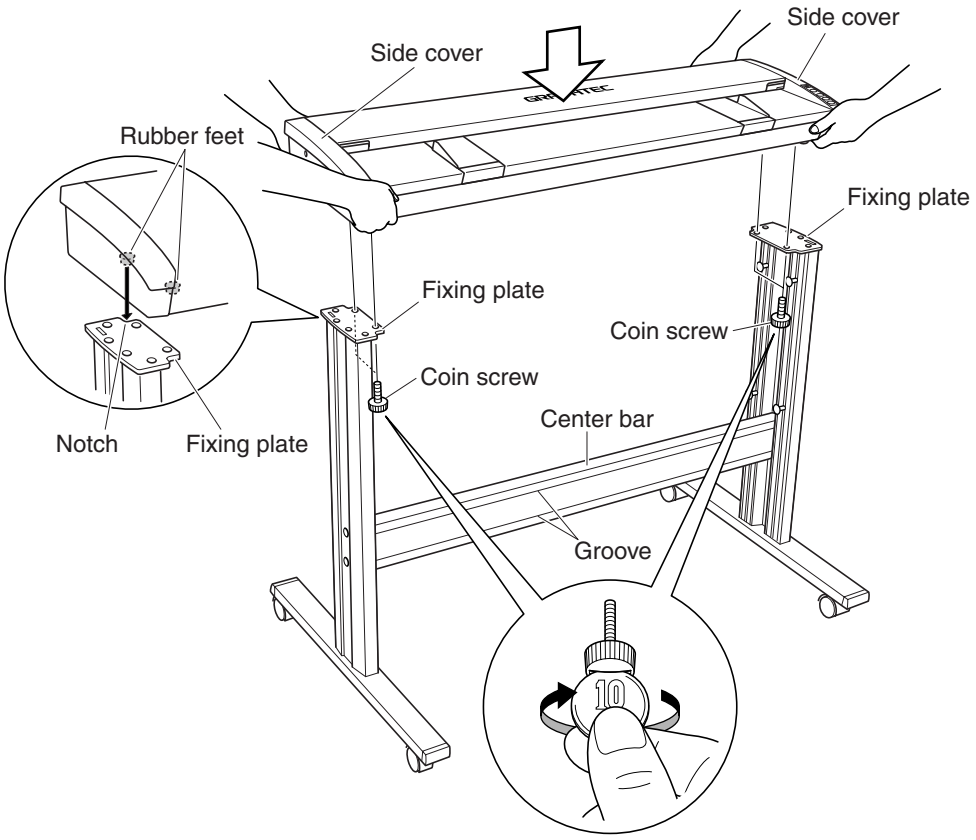
TIP

Attach the center bar loosely. Tighten the bolts securely after the scanner unit has been mounted on the stand.

(3) Hold the scanner unit by the side covers on both sides as you adjust its position until the rubber feet on the underside of the scanner unit are aligned with the notches in the fixing plate of the scanner stand. Place the scanner unit on the stand, and secure it in place using the four coin screws provided.

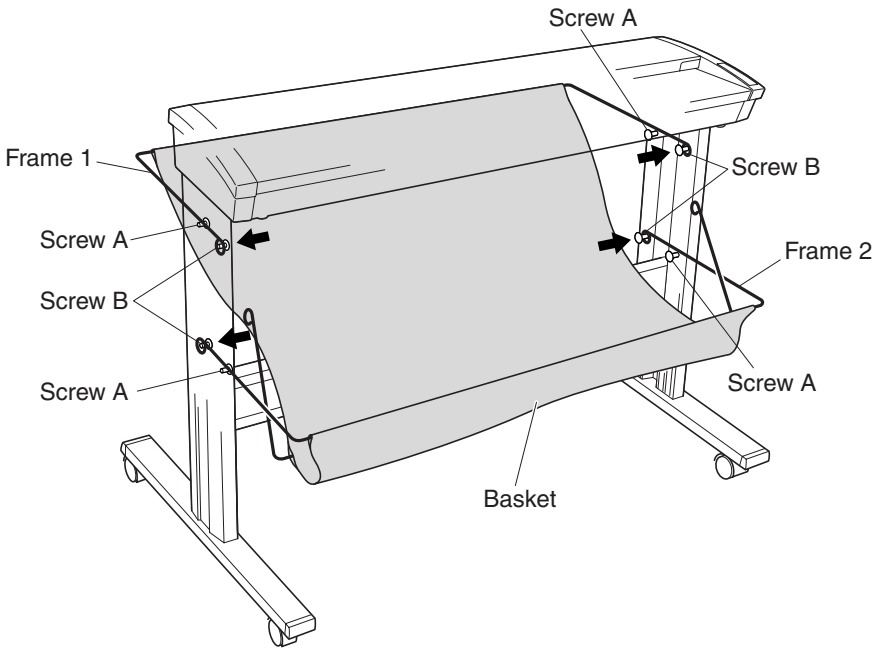
⚠ CAUTION

Holding the scanner by the rear part of the top cover may cause damage to the scanner or to the persons doing the installation. Always hold the scanner by the underside.

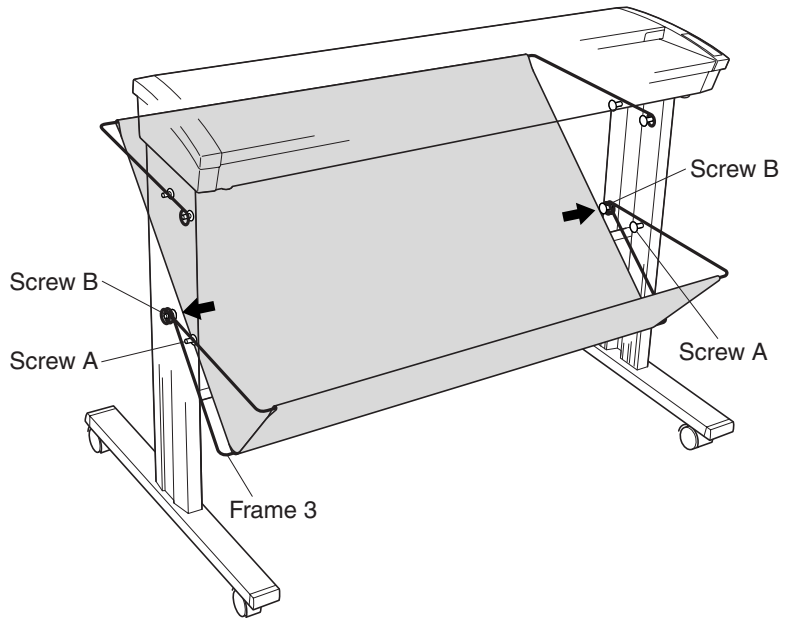


(4) Secure the side stays in place by tightening up the four center bar fixing screws (see (2) above).

(5) Attach the basket to the stand
Position frames 1 and 2 so that they rest on screws A and are hooked onto screws B in order to attach the basket.



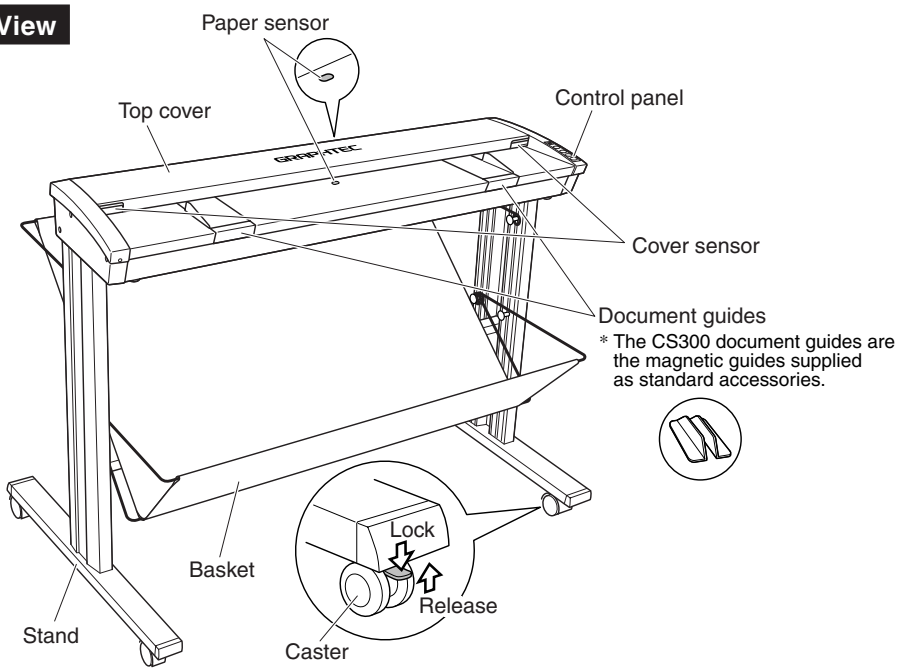
(6) Attach frame 3 to screws B below screws A and stretch out the basket cloth.



(7) Always ensure that you remove the cushion material that is included below the document hold-down unit before using the product. (Refer to Section 5.1, “Opening and Closing the Top Cover”.)

2.2 Part Names and Functions

Front View



Top cover
Open the top cover to clean the document hold-down unit and transparent contact plates.

Paper sensors
These sense whether a document is present in the scanner.

Cover sensor
This senses whether the top cover is open or closed, and interrupts scanner operation if the top cover is opened during operation.

Document guides
Use these guides to determine the position of a document when you load the document. These guides are a sliding type for the CS400 and a magnetic type for the CS300.

Control panel
Use the keys to operate the scanner and the LEDs to monitor the operating status.

Stand
The stand unit is assembled for mounting of the scanner unit.

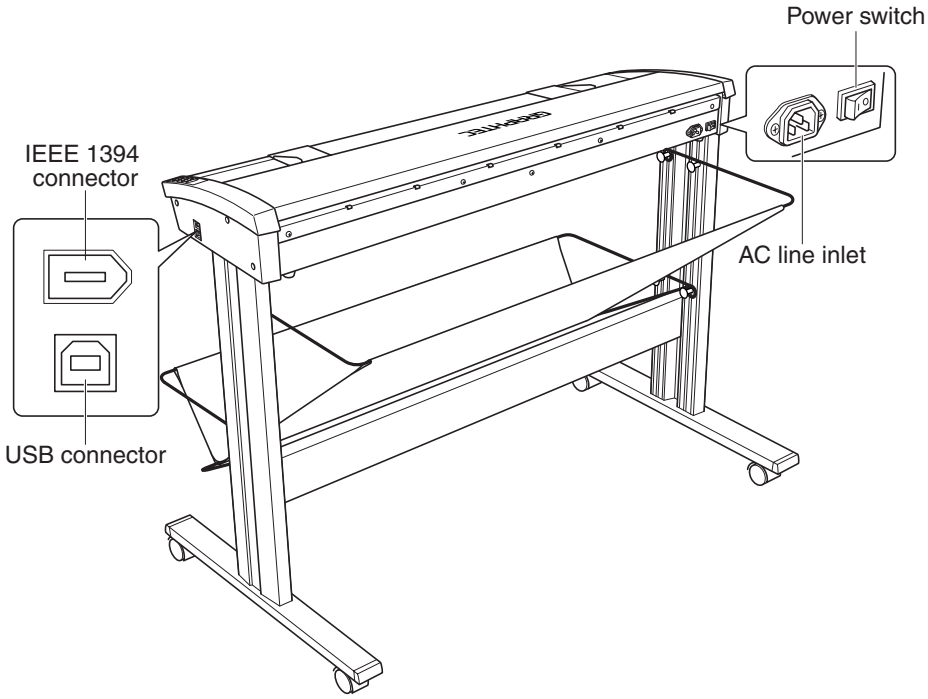
Basket
Receives the document that has been scanned.

Casters
Release the lock on the casters to allow the unit to be moved.

⚠ CAUTION

Do not touch the paper sensors.

Rear View



Power switch
Controls the on/off status of the power supply to the scanner.

AC line inlet
Connect the power cord's female plug here.

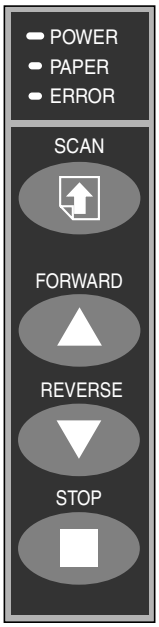
USB connector
Used to connect the USB interface cable.

IEEE 1394 connector
Used to connect the IEEE 1394 interface cable.

⚠ CAUTION

The USB and IEEE 1394 connectors cannot be used at the same time. Do not connect both the USB and IEEE 1394 cables to a computer, or to two separate computers, at the same time.

Control panel



POWER LED

Unlit : Is unlit while the scanner is turned off.
Lit (green) : Lights when the scanner is turned and remains lit while it is operating normally.
Flashing (orange) : Flashes when the scanner is in power-saving mode.

PAPER LED

Unlit : Normal status (Local status).
Lit (green) : Lights when the scanner enters Scan READY status.
Flashing (green) : Flashes while image data is being scanned.

ERROR LED

Lit (red) : Lights to indicate a hardware error.
Flashing (red) : Flashes when a document is detected during the self-test when the scanner is turned on; when scanning is suspended by pressing the STOP key; when a paper jam is detected; or when the document length is shorter than the specified scan length.*
Unlit : Normal status

(* When "Confirm" has been selected for the End-of-paper Processing setting in the Scanning Master 21+ driver.)

SCAN key

This key enables you to scan a document according to the settings of Scanning Master 21+ when the scanner is connected to a computer. Start up Scanning Master 21+ before scanning a document if it is not already active.

FORWARD key

Advances the document into the scanner. When this key is pressed in Scan READY status, the Scan READY status is cancelled and the document is ejected toward the rear of the scanner.

REVERSE key

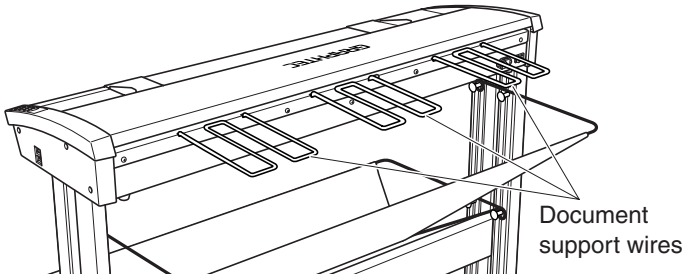
Feeds the document toward you. When this key is pressed in Scan READY status, the Scan READY status is cancelled and the document is ejected toward the front of the scanner.

STOP key

Compulsorily stops scanning of the document.

2.3 Attaching the Document Support Wires

Always ensure that the document support wires are attached to the scanner unit before scanning a document.

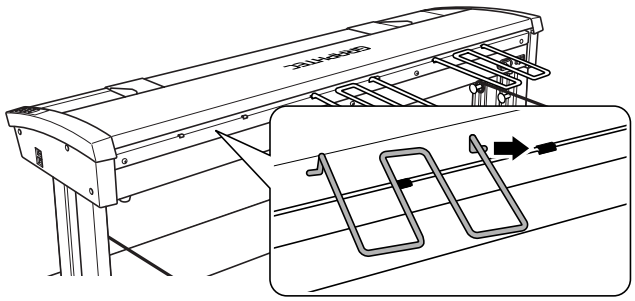


⚠ CAUTION

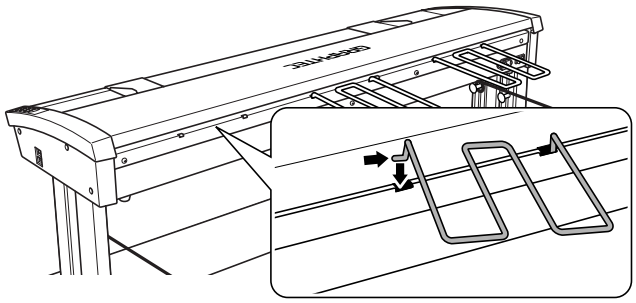
The document may be damaged upon contact with the power cable if it is scanned without the document support wires in place.

Attaching the document support wires

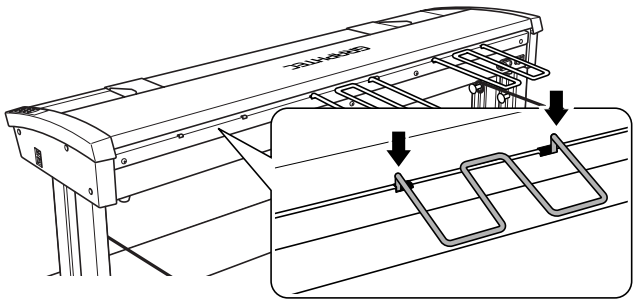
(1) Insert one end of the document support wire provided into the slot at the rear of the scanner.



(2) Squeeze the document support wire, and insert the other end.



(3) Press down on both sides of the document support wire.



(4) Attach the other document support wires in the same manner.

CHECKPOINT

Detach the document support wires when moving or packing the scanner. Squeeze softly and lift them to detach.

3. PREPARING TO OPERATE THE SCANNER

3.1 System Requirements

The minimum system requirements for running the scanner's hardware and software are listed below.

- **Operating system:** Windows 2000 Professional/XP Professional/XP Home Edition
- **CPU:** Pentium III/4
- **Memory:** 32 MB or more
- **Monitor:** 1024 × 768 pixels, 256 colors or more
- Enough disk space to store data
- **Mouse**
- **USB 2.0 interface**[*1] (that comes standard with your computer) or IEEE 1394 interface[*2]

[*1] If your scanner does not operate with the USB interface that comes with your computer, or if your computer does not have a USB 2.0 interface, please contact your sales representative or nearest Graphtec vendor for information on supported add-on cards.

[*2] Graphtec does not guarantee correct scanner operation with every IEEE 1394 computer interface or add-on card. Please contact your sales representative or nearest Graphtec vendor for information on supported add-on cards.

Recommended environment

For binary monochrome data

- **CPU:** Pentium 4
- **Memory:** 64 MB or more
- **USB 2.0 interface** (that comes standard with your computer)

For grayscale data

- **CPU:** Pentium 4
- **Memory:** 256 MB or more
- **Monitor:** 1024 × 768 pixels, High Color or higher resolution
- **USB 2.0 interface** (that comes standard with your computer)

For 8-bit/24-bit color data

- **CPU:** Pentium 4
- **Memory:** 512 MB or more
- **Monitor:** 1024 × 768 pixels, True Color or higher
  USB 2.0 interface (that comes standard with your computer)

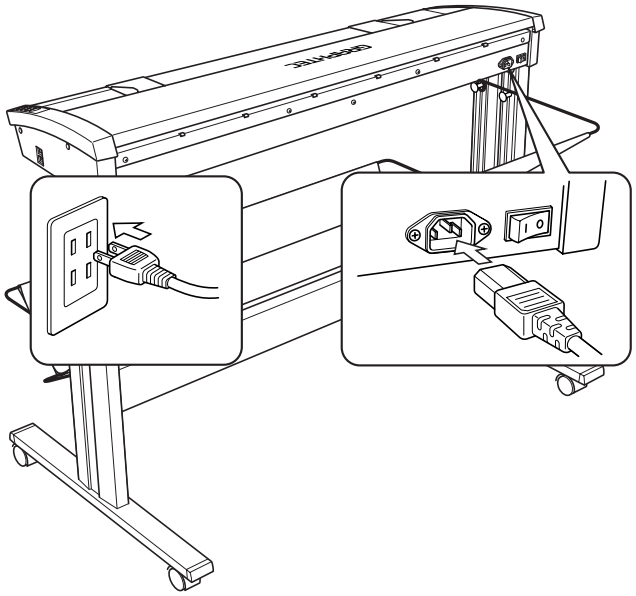
The system configuration should correspond to the recommended specifications listed here, in order to ensure the optimum capabilities of the scanner.
Use with a system configuration below the recommended specifications will affect the scanning speed and prevent the scanner from operating to its specified capabilities.
To edit an A1-size or larger grayscale document with a resolution of 400 dpi or higher, or a color document, you may need more than the recommended memory sizes above.
Depending on the type of document, you may not be able to scan in the document even if you increase the memory size.

3.2 Connecting the Scanner to a Power Supply

Connecting the Power Cable

Insert the female plug of the power cord provided into the scanner's AC line inlet and insert its male plug into an electrical socket supplying AC voltage.

Check that the scanner's Power switch remains in the Off position until the connection of both the power cord and the interface cable has been completed.



CHECKPOINT

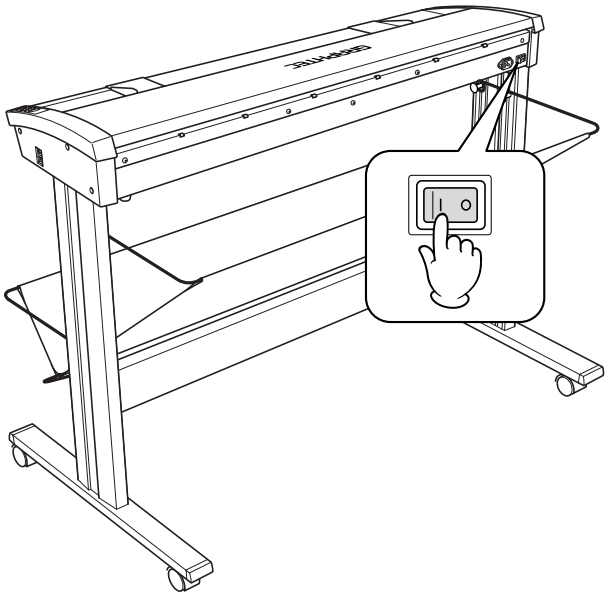
Ensure that the scanner's Power switch is in the Off position.

⚠ CAUTION

Make sure that your scanner is properly grounded. If it is not grounded, there is a possibility that noise will cause incorrect operation, or that the scanned image may be distorted.

Turning the Scanner On or Off

Whenever the scanner's Power switch is turned on, the POWER, PAPER, and ERROR lamps on the control panel light up. When the scanner has been initialized, the POWER lamp lights up.



CHECKPOINT

When resetting the scanner by turning it off then back on again, wait at least five seconds before turning it back on.

3.3 Connecting the Scanner to a Computer

The scanner can be connected to a computer using the **USB interface** or **IEEE 1394 interface**.

⚠ CAUTION

The operation of the scanner cannot be guaranteed in the following cases:

- When the cable is connected to a USB hub or an add-on USB board.
- When you are using a custom-built computer or one that you have modified.

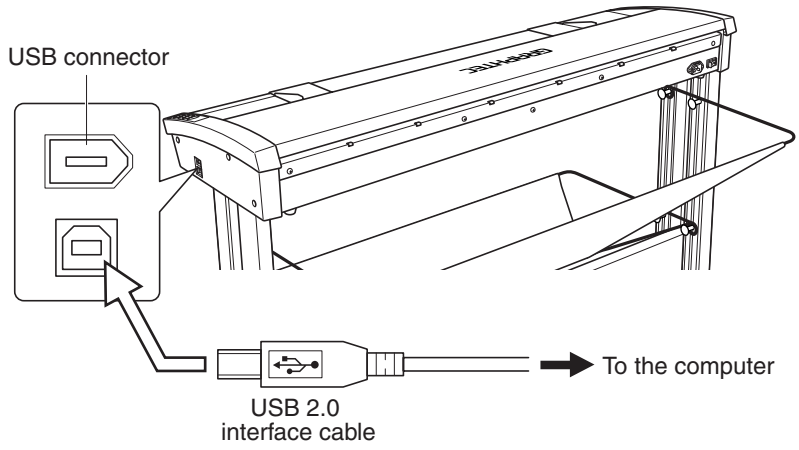
The following should never be attempted:

- Remove or reinsert the cable while you are installing the driver.
- Remove or reinsert the cable while starting up the computer or the scanner.
- Remove or reinsert the cable within a period of 5 seconds.
- Remove or reinsert the cable while transferring data.
- Connect two or more scanners to a single computer.

The USB and IEEE 1394 connectors cannot be used at the same time. Do not connect both the USB and IEEE 1394 cables to a computer, or to two separate computers, at the same time.

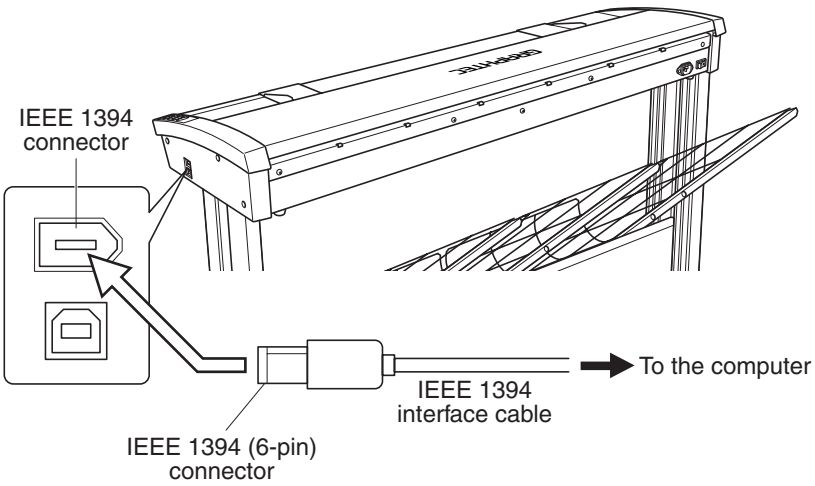
Connecting the scanner via a USB 2.0 interface

(1) Ensure that you have a USB 2.0 interface cable that works with your computer. Plug the USB 2.0 interface cable into the USB connector socket situated on the right-hand side of the scanner unit.



Connecting the scanner via an IEEE 1394 interface

(1) Ensure that you have an IEEE 1394 interface cable that works with your computer. Plug the IEEE 1394 interface cable (6-pin) into the IEEE 1394 connector socket situated on the right-hand side of the scanner unit.



3.4 Installing the Driver Software

CHECKPOINT

The procedure outlined below is based on the requirement that you are logged on to Windows with administrator rights. Consult your Windows 2000 or Windows XP manual for more information.

For Windows 2000

The following procedure assumes that you are using the CS400 as part of your system, and that you are using the USB interface. If you are using the IEEE 1394 interface, GRAPHTEC CS400-10 IEEE 1394 SBP2 Device will be displayed where CS400-10 is displayed when the USB interface is used. Substitute CS300-10 for CS400-10 for guidelines as to how to use the CS300.

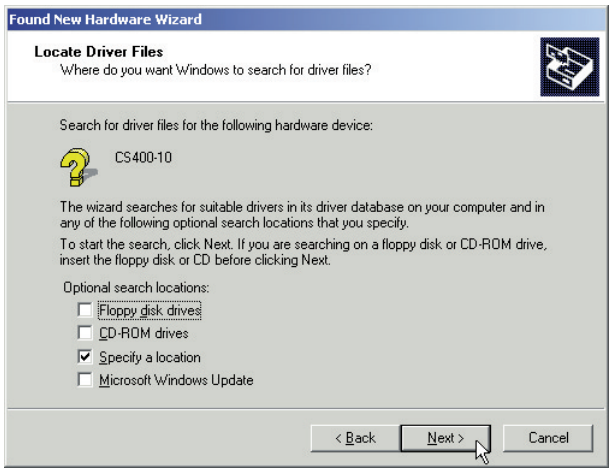
(1) Connect the scanner to the computer, and turn on the computer's power. Insert the CD-ROM disk (included with your computer) into the CD-ROM drive of the computer after Windows has started up, and then turn on the scanner's power.

(2) The message below appears.

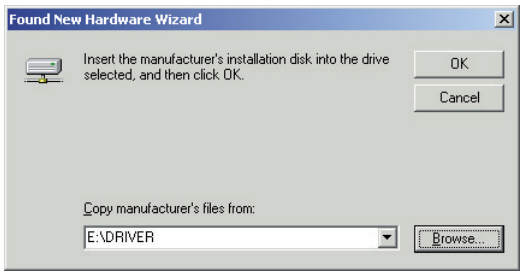
(3) Next, the Found New Hardware Wizard appears.

(4) Click the Next button to proceed to the menu for installing the driver.

(5) Select the option "**Search for a suitable driver for my device (recommended)**" and click Next.



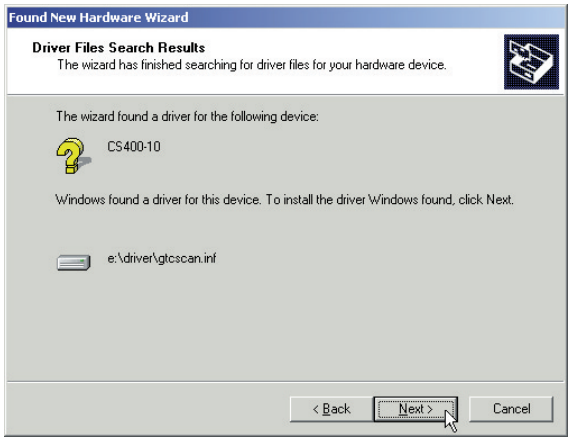
(6) Select the check box entitled "**Specify a location**" and click Next.



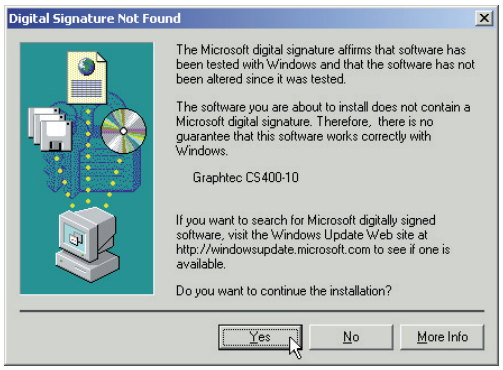
Click Browse and select the DRIVER folder in the CD-ROM drive or enter a CD-ROM drive name and \DRIVER using the keyboard.

Example: For drive E, enter "**E:\DRIVER**."

(7) When you click OK the wizard will start searching for the driver. The screen shown below is displayed when the wizard has finished searching.



(8) The screen shown below is displayed when you click Next.



Click Yes to continue the installation.

(9) The screen shown below is displayed when the wizard has finished installing the driver.

Click the Finish button.

(10) The Windows 2000 Desktop appears and the Scanner is acknowledged by the computer.

For Windows XP

The following procedure assumes that you are using the CS400 as part of your system, and that you are using the USB interface. If you are using the IEEE 1394 interface, GRAPHTEC CS400-10 IEEE 1394 SBP2 Device will be displayed where CS400-10 is displayed when the USB interface is used. Substitute CS300-10 for CS400-10 for guidelines as to how to use the CS300.

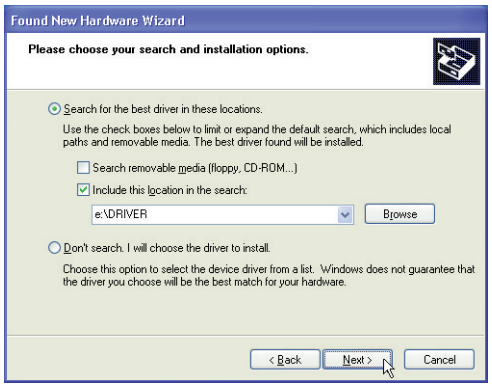
(1) Connect the scanner to the computer, turn on the scanner first, and then turn on the computer. When Windows starts up, insert the CD-ROM supplied with the scanner in the CD-ROM drive. Turn on the power to the scanner.

(2) When Windows XP starts up, the following window appears.

(3) Next, the Found New Hardware Wizard window appears.

Select the option “Install from a list or a specific location (Advanced)”.

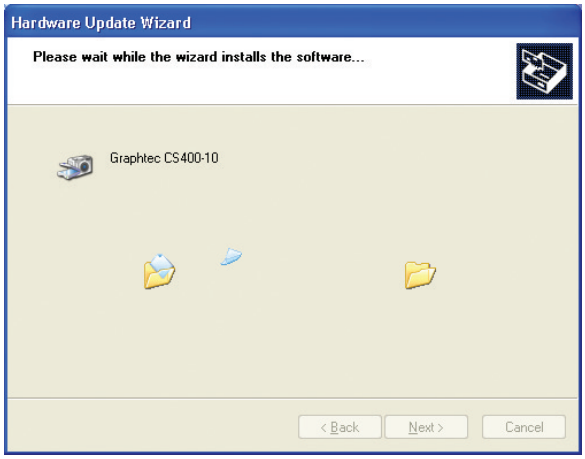
(4) The screen shown below is displayed when you click Next.



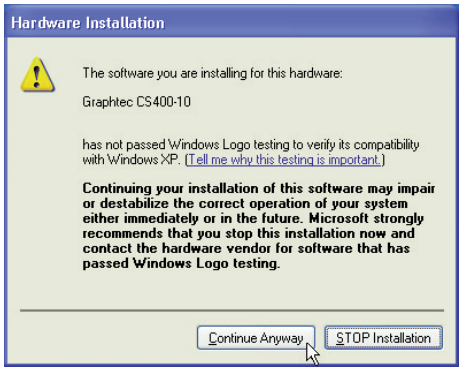
Select the option “**Search for the best driver in these locations**” and select the check box entitled “**Include this location in the search**”.
Click Browse and select the DRIVER folder in the CD-ROM drive or enter a CD-ROM drive name and \DRIVER using the keyboard.

Example: For drive E, enter “**E:\DRIVER**.”

(5) When you click Next the wizard will start searching for the driver.

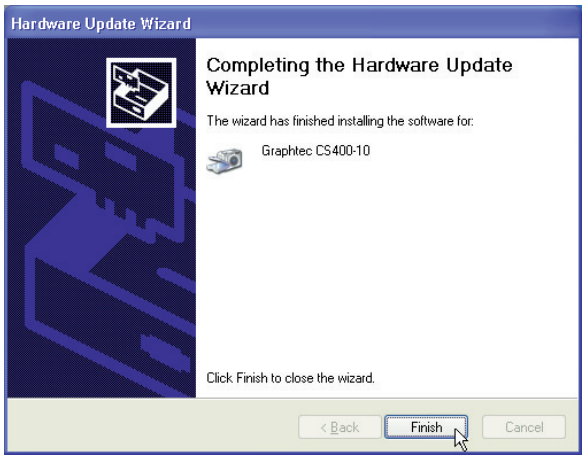


(6) The screen shown below is displayed.



Click Continue Anyway to continue the installation.

(7) The screen shown below is displayed when the wizard has finished installing the driver.



Click the Finish button to close the "**Welcome to the Found New Hardware**" wizard.

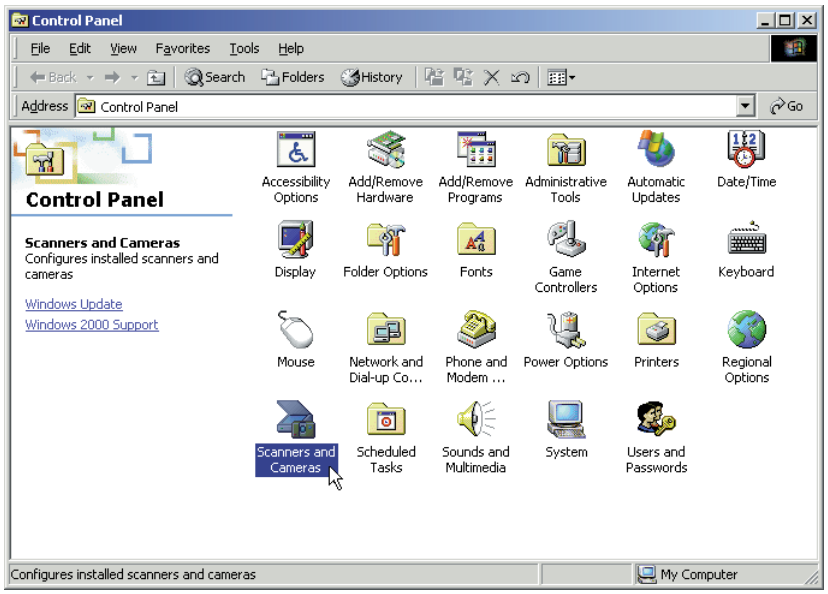
(8) The Windows XP desktop appears, and the scanner is recognized by the computer.

3.5 Checking the Interface Connection

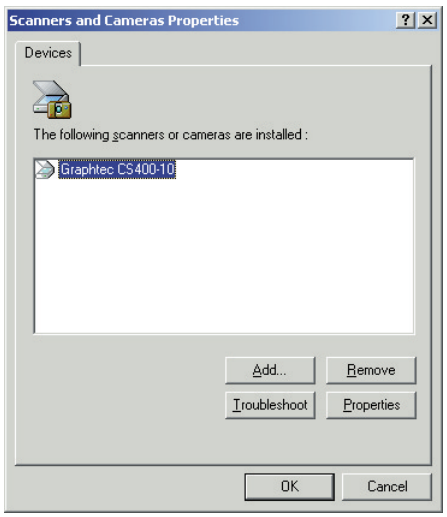
For Windows 2000

The procedure outlined below assumes that the CS400 is connected in your system. Substitute CS300-10 for CS400-10 for guidelines as to how to use the CS300.

(1) Launch the Control Panel using the Start menu.



(2) The screen shown below is displayed when you click on the "**Scanners and Cameras**" icon.

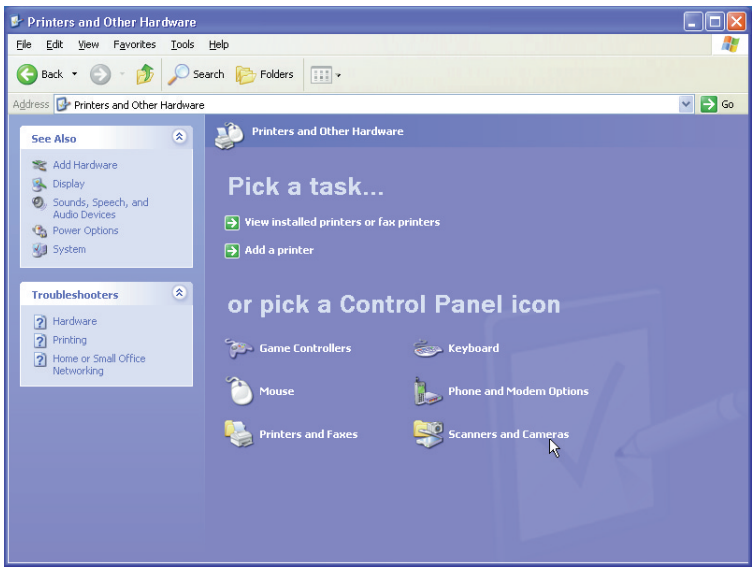


Ensure that "**Graphtec CS400-10 or CS300-10**" is indicated here.

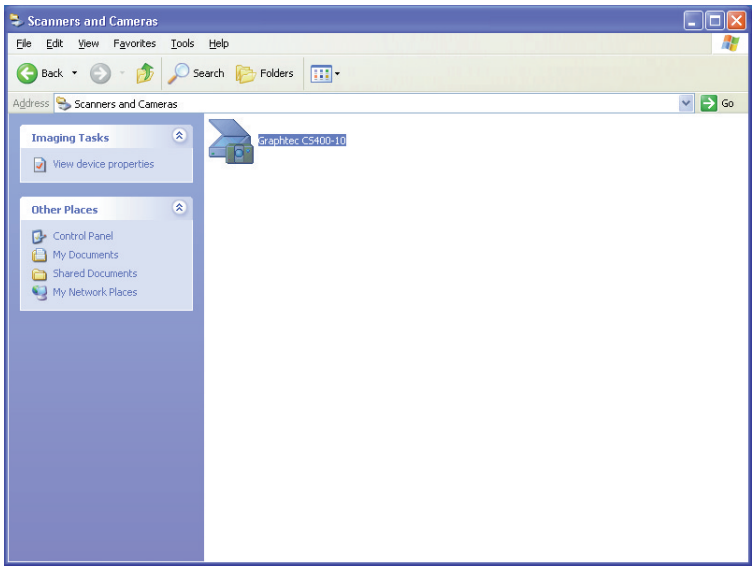
For Windows XP

The procedure outlined below assumes that the CS400 is connected in your system. Substitute CS300-10 for CS400-10 for guidelines as to how to use the CS300.

(1) Launch the Control Panel using the Start menu.



(2) The screen shown below is displayed when you click on the "**Printers and Other Hardware**" icon.



(3) The screen shown below is displayed when you click on the "**Scanners and Cameras**" icon.
Ensure that "**Graphtec CS400-10**" or "**Graphtec CS300-10**" is indicated here.

3.6 Installing the Scanning Master 21+ Application

The Scanning Master 21+ "OPS112" is a software application for using a Graphtec scanner to scan image data.

Operating Environment

Windows 2000 Professional/XP Professional/XP Home Edition

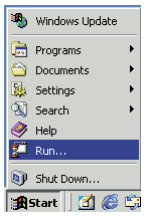
Installation Procedure

(The following steps are explained using the Windows 2000 windows.)

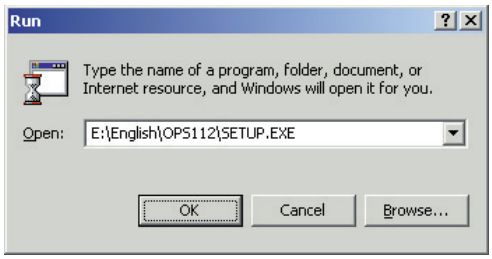
(1) Boot Windows 2000.

(2) Insert the User Guide CD-ROM containing the OPS112 program files into the computer's CD-ROM drive.

(3) Click the Taskbar's Start button, then click the Run... icon.



(4) Enter the CD-ROM drive name and English\OPS112\SETUP.EXE as the name of the file you wish to open.
If the disk is in drive E, for example, enter "**E:\English\OPS112\SETUP.EXE**" in the box.



(5) Click the OK button to run the OPS112 setup program. From this point on, follow the setup program's instructions to install the OPS112 application.

- If the application has been properly installed, "**Scanning Master 21+**" will be newly listed in the Program menu accessed from the Start button.

TIP

For more details, open the README.TXT file provided in the "**Scanning Master 21+**" folder.

4. LOADING A DOCUMENT

This chapter describes the document types compatible with your scanner and procedures related to loading a document.

4.1 Compatible Document Types

Because the scanner scans a document while feeding it, the document types that it can scan are subject to the following restrictions.

Compatible Media Widths for Scanning

Documents with a maximum width of 1016 mm

Size	ISO	Size	ANSI
A4	210 mm × 297 mm	A	8.5 in × 11 in
A3	297 mm × 420 mm	B	11 in × 17 in
A2	420 mm × 594 mm	C	17 in × 22 in
A1	594 mm × 841 mm	D	22 in × 34 in
A0	841 mm × 1189 mm	E	34 in × 44 in

Compatible Media Lengths for Scanning

Documents up to approximately 16 m in length (driver software limitation) can be scanned. However, the actual document length that can be scanned is limited by the available memory (hard disk or other data storage device) of the computer to which the scanner is connected, and also by the grade of the medium being scanned.

Compatible Grades & Thickness for Scanning

- **Media Grades**
  The scanning precision is guaranteed for high-grade tracing paper (see APPENDIX B, “SPECIFICATIONS”).
  Other compatible media types are listed below.
  High-grade paper : 60 g/m^2
  Tracing paper : 50 to 55 g/m^2
  Mylar : 50 μm
  Copy paper
  Diazo photo-sensitive paper

- **Media Thicknesses**
  Observe the following points when scanning a thick medium.
  - The CS400/300 cannot scan a document that is thicker than 1.5 mm.
  - When using the carrier sheet, ensure that the combined thickness of both the document and carrier sheet does not exceed 1.5 mm.
  - The carrier sheet alone is 0.2 mm thick.

Regarding the automatic detection of the paper size

This scanner supports the automatic detection of the document size by determining where the edges of the document are. The edges of the document cannot, however, always be detected correctly, especially if the document is thin. The scanner also assumes that the document is set in the center when it determines the document size.

⚠ CAUTION

The correct document size cannot be detected when a carrier sheet is used because the carrier sheet is detected instead.
The document size may not be detected correctly if the document hold-down unit or transparent contact plates are dirty. Please clean the document hold-down unit and transparent contact plates in such cases.

When automatic detection is selected for the document size

- **Automatic detection**
  The document is scanned to automatically detect width and length.
- **Automatic detection of standard size**
  The document is scanned in the standard paper size determined from the automatically detected document width.
- **Automatic detection—ISO series**
- **Automatic detection—ANSI series**
- **Automatic detection—ARCH series**
- **Automatic detection—DIN series**
  The document is scanned in the paper size of the respective series as determined from the automatically detected document width.

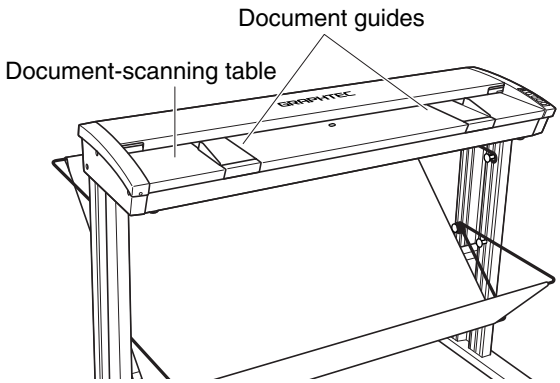
4.2 Loading a Document

Insert the document onto the document-scanning table face down so that it presses against the rollers evenly.

How to use the document guides

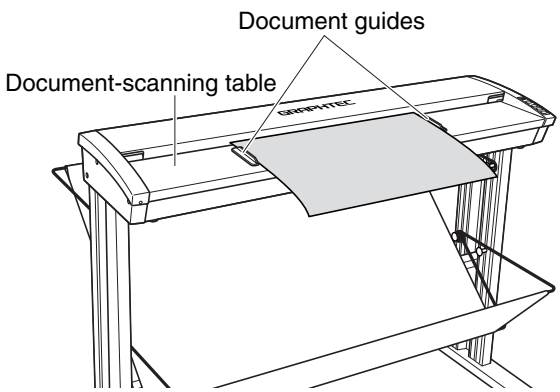
CS400

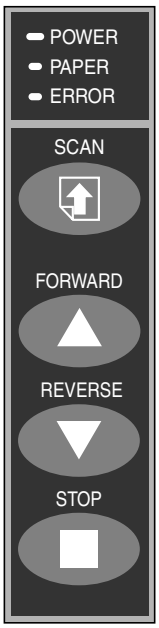
- Move the document guides to the left and right until they are adjusted to the document width.
- Place the document between the document guides.
- Move the document guides back to the edges of the scanner after you have loaded the document.
- This ensures that the document does not get damaged if it is fed at an angle.



CS300

The document guides are attached to the document-scanning table via magnets. Place them at the edges of the document in alignment with the document width.
Remove the document guides after you have loaded the document in order to ensure that the document does not get damaged if it is fed at an angle.





There are two document setting modes available (set by the driver software).

- The rollers start turning at a preset delay time after the document has been inserted so that they automatically feed the document to the position to start scanning.
- The rollers start turning when the **FORWARD** switch on the control panel is pressed after a document is inserted so that they automatically feed the document to the position to start scanning. (Manual loading)

Press the **REVERSE** switch to eject the document in order to reload it. The **PAPER LED** lights up when a document is correctly loaded.

TIP

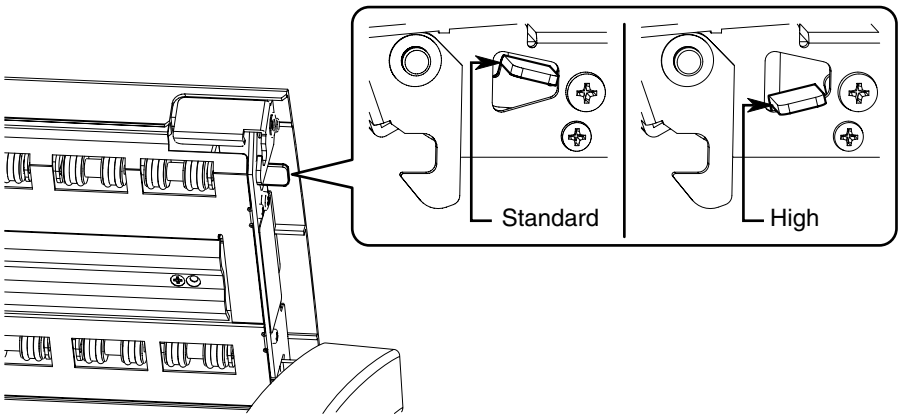
If the PAPER LED does not light after the document feed operation has stopped, press the FORWARD key to advance the document again.

⚠ CAUTION

- After the scanner is turned on and the driver settings have been enabled in the Scan window, it waits for approximately three seconds before beginning the specified scan operation.
- Load the document in the scanner with the face to be scanned facing downward.
- Do not place anything other than the document to be scanned on the scanning table, as the scanner rollers may start rotating, which is extremely dangerous.
- The document may not be fed in correctly if it is curled. The carrier sheet provided should be used for curled documents (see Section 4.6, “Using the Carrier Sheet” for details).
- Load the document in the center of the scanner, as the document may be fed in at an angle and not scanned correctly if it is significantly off-center.

4.3 Making the Document Hold-Down Unit Force Settings

Changing the position of the lever at the right side of the top cover enables you to switch between two hold-down force settings. Use this facility according to the status of the document to be scanned.



High ..... Use this setting with:

- Plain paper with a thickness of 0.8 mm or higher
- Documents with creases or strongly curled documents where the creases or curl affect the scanning quality

Standard ..... This mode is normally used to scan a document.

⚠ CAUTION

- Do not use the “High” setting with paper less than 0.8 mm thick or with fine or limp documents, as the document may become damaged or jammed in the scanner. The “High” setting has a stronger hold-down force than that of the “Standard” setting, and may cause damage to thin documents. In addition, because the precision accuracy also differs, a distance correction operation may need to be performed when you switch from one setting to the other.
- Use the carrier sheet when scanning film documents or similar.
- Be sure to use the “Standard” setting with photographs or other documents that have a glossy surface. If you use the “High” setting, the document may stick to the scanner glass and adversely affect the scanning quality.
- Always ensure that you check the lever status before using the scanner, because the modes may switch if the scanner has been subjected to a strong vibration as a result of being dropped or shaken.

4.4 Handling Documents According to their Material and Thickness

The following problems may occur, depending on the weight and surface condition of the document being scanned.

- The document cannot be loaded.
- Scanning of the document stops half way through.
- The document slips (resulting in displaced images).
- The end of the document is not scanned.

Such problems may be avoided by taking the following corrective measures.

- Lower the scanning speed.
- Support the document at the front and the back of the scanner.

4.5 Distance Correction

Corrections to the distance can be achieved using the driver software. The driver software included with your scanner ("Scanning Master 21+") enables you to perform distance correction from the menu **Tool** → **Adjust Scanner** in order to adjust the scanning accuracy. The adjustment function must be set up when a scanned drawing needs to approximate the accuracy of the original drawing closely. (This is for making fine adjustments to the accuracy of the scanned drawing to suit the quality of the paper being used.) It is not normally necessary to perform this adjustment.

Adjustment method

Perform the distance correction process according to the type of document to be scanned. Distance correction can be set in a range of ±1%, which remains effective until the scanner's power is turned off. The practice of distance correction necessitates that you measure a vertical line drawn on the document before following the procedure described below.

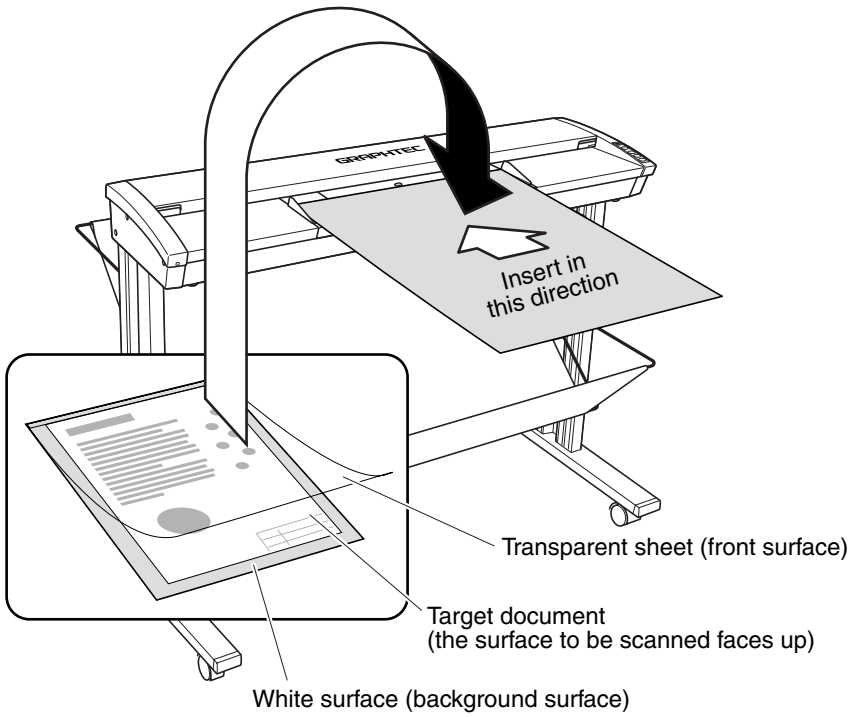
(1) Choose a document that has one or more vertical lines drawn on it and scan it at a resolution of 600 dpi (Portrait (vertical) format).
(2) Measure the length of the vertical line of the document and classify it as x (distance on the document).
(3) Measure the length of the same vertical line in the image data using the command to measure the distance between two specified points of relative measurement, and classify it as y (distance after the scan has taken place).
(4) Click on the **Distance Correction** button in the **Adjust Scanner** window to open the **Distance Correction** window.
(5) Enter the value "x" (distance on the document) and the value "y" (distance after the scan has taken place) in this window. The values entered here must be within the range of the distance correction.
(6) Click the OK button to calculate the correction value. The distance will be corrected the next time a document is scanned.

4.6 Using the Carrier Sheet

Use the carrier sheet according to the condition of the document to be scanned.
In the case of scanning the following types of media, always place the document in the carrier sheet before loading it into the scanner.

- To scan a medium that is as limp or limper than a newspaper
- To scan a document that is smaller than A4 size or a document of non-standard size
- To scan a medium that tears easily
- When the target document cannot be properly advanced to the initial position of scanning (because the target document is folded, wrinkled, or otherwise hard to load in the scanner)
- To scan transparent or translucent documents
- To scan a curled medium

As shown in the figure below, place the document in the carrier sheet with the document's surface to be scanned facing up (against the transparent top sheet). For scanning, load the carrier sheet into the scanner with the document's target surface (the transparent top sheet) facing down.
If you use the carrier sheet when scanning color documents, the colors may shift slightly in some cases. If this happens, set the document hold-down unit force setting to "High".



CHECKPOINT

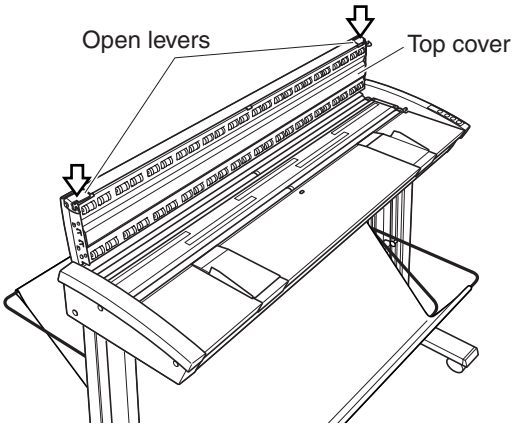
When handling the carrier sheet, be very careful not to scratch it or otherwise damage it.

5. DAILY MAINTENANCE

5.1 Opening and Closing the Top Cover

(1) Turn off the scanner's power.

(2) Push the left and right open levers on the top cover to unlock them, and hold the middle part of the top cover while you open the top cover by about 90 degrees.

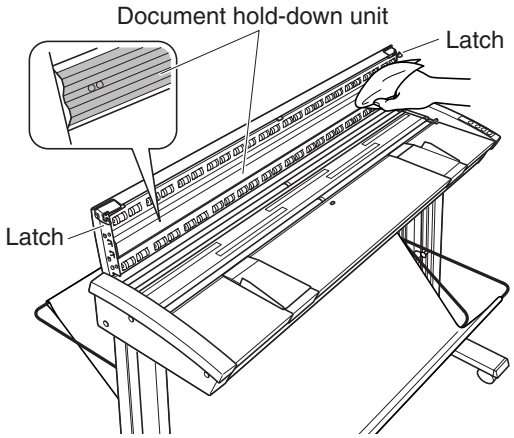


(3) Close the top cover until the left and right latches on the top cover lock into position, making sure that you don't get your fingers caught.

5.2 Cleaning the Document Hold-Down Unit

(1) Turn off the scanner.

(2) Open the top cover as described in Section 5.1 “Opening and Closing the Top Cover”.



(3) Wipe clean the underside of the document hold-down unit (see below) using a soft cloth that has been soaked in water or diluted neutral detergent and thoroughly wrung out.

(4) Wipe the document hold-down unit once again using a soft, dry cloth (remove all moisture).

(5) Close the top cover as described in Section 5.1 “Opening and Closing the Top Cover”. Take care not to get your fingers caught in the cover.

⚠ CAUTION

Scanning may be affected if the underside of the document hold-down unit becomes scratched or dirty. It must be cleaned when necessary.

5.3 Cleaning the Image Sensors

The scanner's image quality drops when the transparent contact plates over the image sensors become dirty, so clean the image sensors whenever necessary.

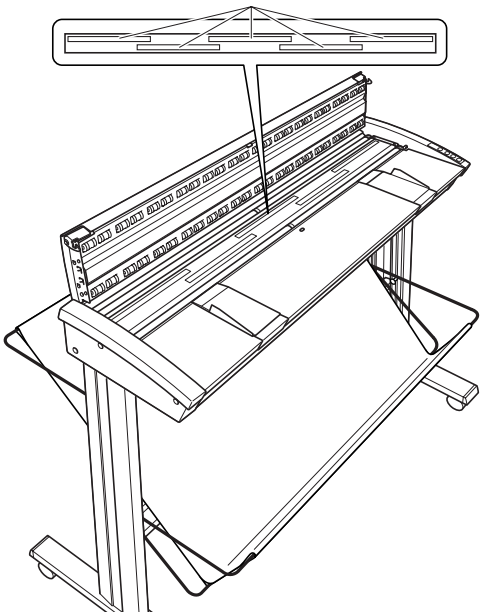
Procedure

(1) Turn off the scanner.

(2) Open the top cover as described in Section 5.1 "Opening and Closing the Top Cover".

(3) As shown below, wipe off any soiled areas on the transparent contact plates using a soft cloth that has been moistened with water or a neutral detergent (diluted with water) and firmly wrung out.

Transparent contact plates



(4) Completely remove any moisture on the transparent contact plates by wiping them off again using a soft, dry cloth.

(5) Close the top cover as described in Section 5.1 "Opening and Closing the Top Cover". Take care not to get your fingers caught in the cover.

⚠ CAUTION

Do not use a commercial cleaner for office equipment, a glass cleaner, or chemical solvents such as solutions containing alcohol.

⚠ CAUTION

Although the transparent contact plate is not a maintenance part that requires periodic replacement, it is a consumable part because its surface may receive slight scratches due to minute particles of dust and other foreign matter. If document scanning produces unsatisfactory results (unexpected white or black streaks in the data) due to scratches on the transparent contact plate or other reasons, please perform the calibration procedure (see Section 5.6, “Calibration”). If the scanning results do not improve after calibration, the transparent contact plate(s) will need to be replaced.

5.4 Cleaning the Paper Sensors

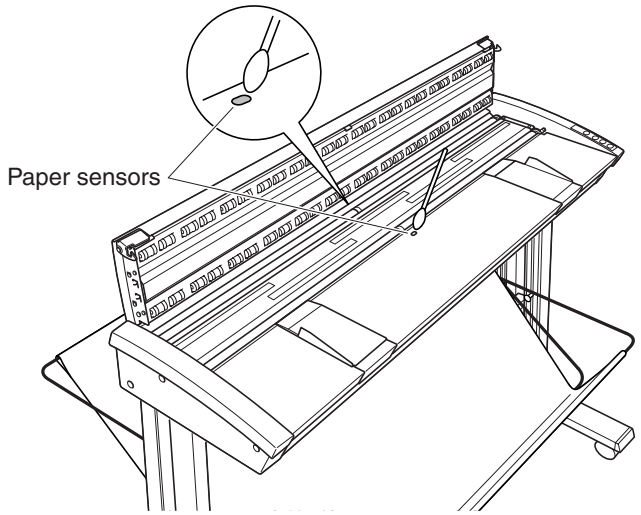
⚠ CAUTION

Accumulated dust on the paper sensors may prevent the document from being detected. The sensors must be cleaned when necessary.

(1) Turn off the scanner.

(2) Open the top cover as described in Section 5.1 “Opening and Closing the Top Cover”.

(3) Wipe the two paper sensors using a cotton swab.



(4) Close the top cover as described in Section 5.1 “Opening and Closing the Top Cover”. Take care not to get your fingers caught in the cover.

⚠ CAUTION

Use a cotton swab or something equally soft to gently wipe the paper sensors. Do not use any chemicals to clean the sensors.

5.5 Removing a Jammed Document

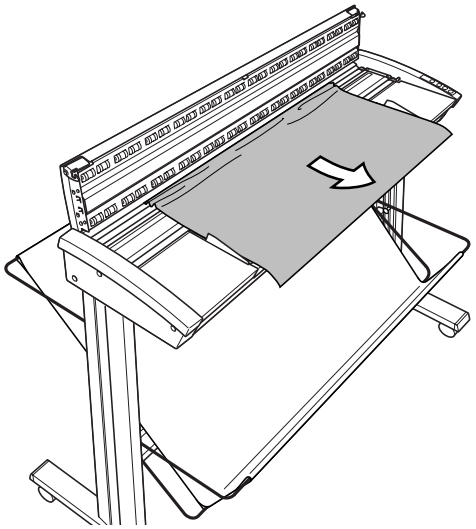
If a document becomes jammed in the scanner during scanning or another operation, immediately turn off the scanner, remove the document hold-down unit, and then remove the jammed document.

Procedure

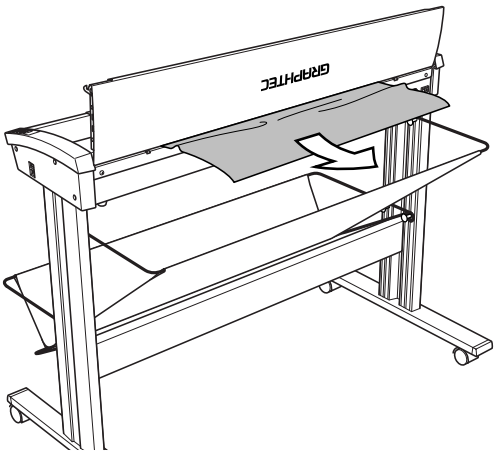
(1) Turn off the scanner.

(2) Open the top cover as described in Section 5.1 “Opening and Closing the Top Cover”.

(3) If the document is jammed at the front, remove the document from the inside or by pulling it forward.



(4) If the document is jammed at the rear, remove the document from the inside by pulling it toward the rear.



(5) Close the top cover as described in Section 5.1 “Opening and Closing the Top Cover”. Take care not to get your fingers caught in the cover.

5.6 Calibration

Calibrate the scanner if scanning quality is observed to deteriorate, with scanned results such as those described below:

- The scanned image is distorted
- Areas of uneven color appear in the scanned image
- Other unsatisfactory results (but not including problems related to media quality, such as folds, wrinkling, or paper curling)

CAUTION

- Handle the calibration sheet with care so that it does not get bent. To prevent soiling, store it in its special storage box. The calibration sheet cannot be used if it is bent or soiled.
- The calibration sheet is a paper product. Do not attempt to clean it with any type of liquid cleaner.
- The calibration sheet is a consumable item. Replacement sheets can be purchased from your sales representative or nearest Graphtec vendor.

Preparation and checks

Recommended usage environment

◆ **Monitor:** 1024 × 768 pixels, High Color or better resolution

TIP

A low-resolution monitor will make it difficult to discern any problem areas.

Launching the Scanner Adjustment Program

(1) Connect the scanner to the PC and switch on the scanner. Switch on the PC.

(2) Install Scanning Master 21+ (OPS112) if it is not already installed.

(3) Click the **Start** button, then select **Programs** > **Scanning Master 21+** > **Scanner Adjustment**.

(4) Click **Scanner Adjustment** to launch the **Scanner Adjustment** program.

Scanner Calibration

Before beginning calibration, clean the transparent contact plates and scanner table surface. Any dust or dirt on this surface may affect calibration results and resulting image quality. Check that the calibration sheet is free of any dust or dirt.

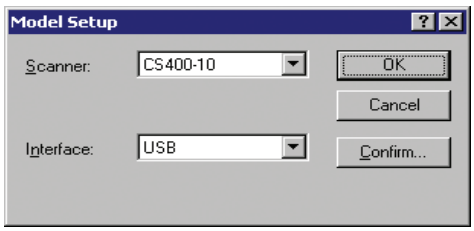
⚠ CAUTION

The calibration procedure will take some time. Do not switch off the scanner while calibration is underway. Accidentally switching off the scanner may result in damage that requires servicing.

(1) Connect the scanner to the computer. Switch on the scanner, then switch on the PC.

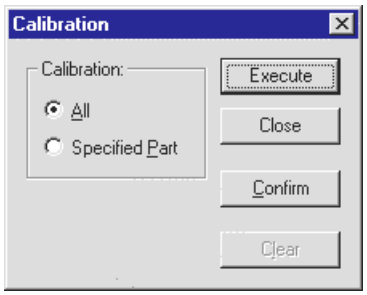
(2) Launch the **Scanner Adjustment** program (as described earlier).

(3) Select **Model Setup** on the **Scanner** menu.



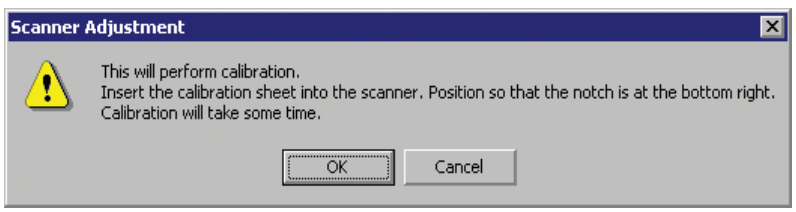
(4) Select the connected scanner and click the **OK** button.

(5) Select **Calibration** on the **Scanner** menu.

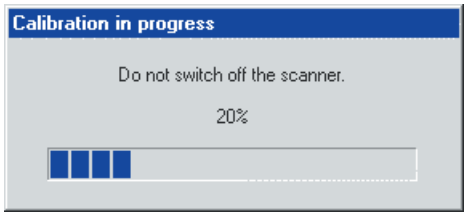


(6) Select **All** in **Calibration** and click the **Execute** button.

(7) The following message is displayed. Insert the calibration sheet into the scanner as instructed.



(8) Clicking the **OK** button begins calibration.

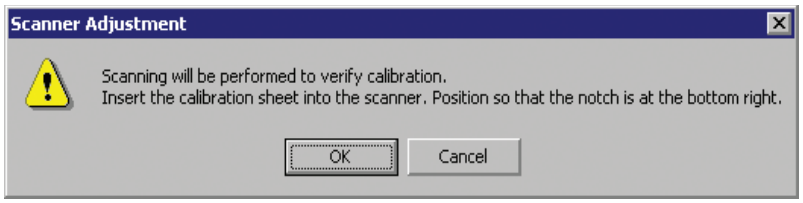


(9) Calibration ends after approximately 10 minutes.

Click the **OK** button to complete calibration.

(10) To check the calibration results, click the **Confirm** button in the **Calibration** menu (shown in step (5) above).

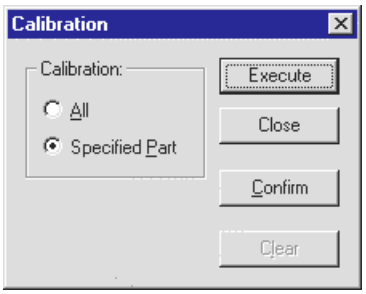
(11) The following message is displayed. Insert the calibration sheet into the scanner as instructed.



(12) Click the **OK** button to start scanning.
The scanned data is displayed when scanning is complete. Colors may differ slightly for individual sensors to make it easier to identify problem areas in calibration. This does not indicate a defect.
Check that there are no vertical streaks, such as white patches, in the scanned data. (Streaks occur when calibration is not performed correctly due to contamination by dust or dirt.)

(13) If the data is normal, calibration is complete.
Click the **Close** button and exit the **Scanner Adjustment Program**.

(14) If any abnormal data is observed, specify the problem areas as follows:
Select **Specified Part** in **Calibration**.



(15) The mouse arrow cursor changes to a cross cursor when moved over the data. Click the left mouse button with the mouse positioned over the streak data. The selected area is shown in blue. Repeat this procedure for any additional streaks. Areas that have been selected (shown in blue) can be deselected by clicking the left mouse button again. To deselect all selected areas, click the **Clear button**.

(16) Once all required areas have been specified, remove the calibration sheet and clean the glass and table surfaces. Check the calibration sheet for dust and dirt, then click the **Execute** button**.**

(17) Return to step (10) and verify the calibration results.

⚠ CAUTION

If you perform the calibration procedure several times with no discernible results, there may be a problem with the scanner itself. In this case, please contact your Graphtec vendor.

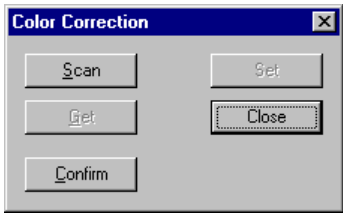
Color Correction

Perform color correction if there is any discrepancy in color in parts of the scanned image even after you have calibrated the scanner.

⚠ CAUTION

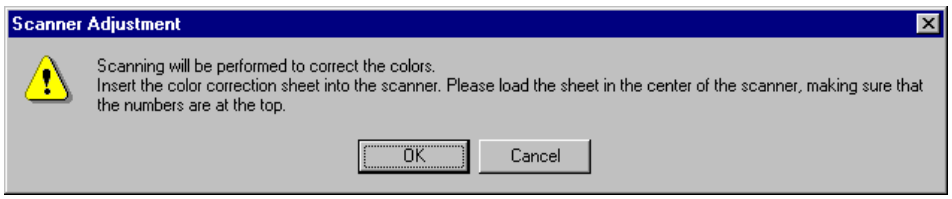
Handle the color correction sheet with care so that it is does not get soiled, bent or scratched. A soiled, bent, or scratched sheet will not give good results. The color correction sheet is a consumable item, and replacement sheets can be purchased from your sales representative or nearest Graphtec vendor.

(1) Select **Color Correction** on the **Scanner** menu.



(2) Click the **Scan** button.

(3) The following message is displayed. Insert the color correction sheet in the scanner.



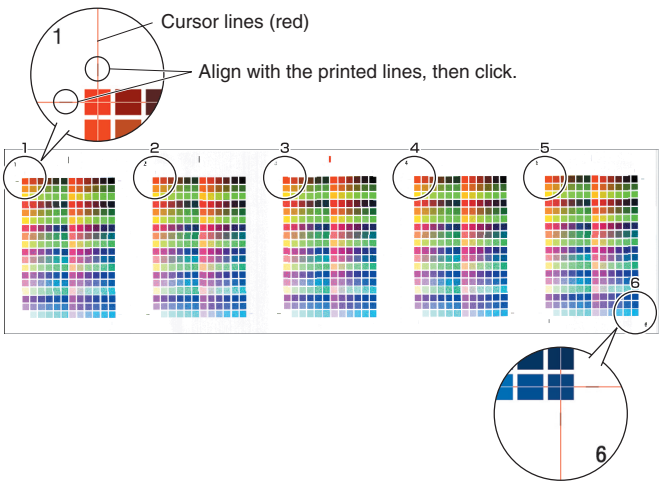
CHECKPOINT

Position the color correction sheet so that the red bar in the center of the sheet is centered in the scanner (but with the printed side down).

(4) Click the **OK** button to start scanning.
The scanned data is displayed when scanning is complete. Colors may differ slightly for individual sensors, but this does not indicate a defect.

(5) When the data is displayed, click the **Get** button.

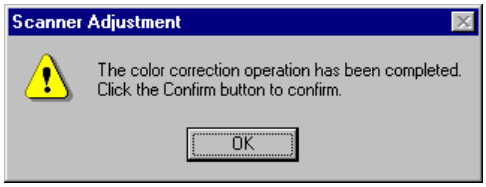
(6) Click in the center of the color tile indicated by the numbers 1 to 6, in ascending order. For numbers 1 to 5, click the center of the upper left tile; for number 6, click in the center of the bottom right tile. Align the cursor crosshairs with the printed lines at the sides of the tile.



CHECKPOINT

- The next reference point to be checked is displayed on the Status bar.
- If you click in error, click the Esc. key to cancel the operation and return to the immediately previous step.
- If you click on the wrong tile, color correction will not be performed correctly and the colors of the image displayed after color correction will be incorrect.

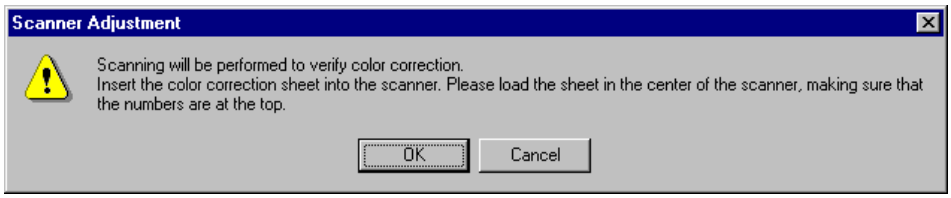
(7) After you have clicked tile number 6, click the **Set** button.



Click the **OK** button.

(8) To check the color correction results, click the **Confirm** button.

(9) The following message is displayed. Insert the color correction sheet in the scanner as instructed.



CHECKPOINT

Position the color correction sheet so that the red bar in the center of the sheet is centered in the scanner (but with the printed side down).

(10) Click the **OK** button to start scanning.
After scanning has been completed, an enlarged view of the color-corrected data is displayed.

(11) Click the **Fit** icon to display the entire image, and check whether there is any discrepancy in color. If there is no discrepancy, color correction is complete. Click the **Close** button.

CHECKPOINT

If there is still some color discrepancy after performing Color Correction, repeat steps (6) through (11).

6. TROUBLESHOOTING PROCEDURES

If the scanner seems to be operating abnormally, perform the troubleshooting procedures described in this chapter before requesting a service call.

6.1 The Scanner Is Turned On But Doesn't Operate at All

Cause	Remedy
The power cord has come loose.	Firmly connect both plugs of the power cord.
The scanner is connected to an electrical socket that does not provide the rated supply voltage.	Use only the rated supply voltage.
The electrical socket is not supplying a supply voltage.	Check the power supply.

6.2 The Scanner Operates Improperly After Connection to the Computer

Cause	Remedy
Is the scanner properly grounded?	Make sure that the scanner is grounded.
Is the USB or IEEE 1394 cable between the computer and the scanner working properly?	Determine whether the cable connector has any problems (e.g., a pin is broken or bent) and ensure that the cable is inserted firmly into position.
Is the USB cable compliant with the USB 2.0 interface that you are running?	Ensure that you use a USB 2.0-compliant USB cable.
Is an add-on USB card being used?	USB 1.1 cards are not supported. Correct operation is not guaranteed when the scanner is connected to a USB port that is not the standard built-in computer port.
Are both the USB and IEEE 1394 cables connected?	Both cables cannot be connected at the same time. Disconnect one of the cables.

The scanner is recognized as connected by the operating system (in the Device Manager), but the message "Scanner not found" is displayed in Scanning Master 21+ and the scanner cannot be connected.

Cause	Remedy
The "Model Setup" settings are not correctly set in Scanning Master 21+.	Set the "Model Setup" settings in Scanning Master 21+ to "CS400-10 or CS300-10." For details, refer to the Scanning Master 21+ User's manual.
Is the "Connection Method" of the Scanning Master 21+ correctly set?	Ensure that the "Connection Method" of the Scanning Master 21+ is set to "USB" when you are using a USB interface. Consult the Scanning Master 21+ user's manual for further information.

6.3 The Control Panel's Red ERROR Lamp Is Lit

Cause	Remedy
A hardware error at the ROM, RAM, etc. occurred during the scanner's self-test.	An internal error has occurred. Contact your sales representative or nearest Graphtec vendor.

6.4 The Control Panel's Red ERROR Lamp Is Flashing

Cause	Remedy
The scanner was turned on with a document left loaded inside it.	Open the cover and remove the document (see Section 5.5, "Removing a Jammed Document").
The top cover was opened during a scanning operation or while a document was left in the scanner.	Press the control panel's STOP button to cancel the error state. Next, remove the document by pressing the FORWARD/REVERSE button to advance the document.
If the document becomes jammed.	Open the cover and remove the document. Refer to Section 5.5, "Removing a Jammed Document."
The document length setting made in Scanning Master 21+ is longer than the length of the actual document.	The scanner's Error lamp flashes when the end of the document is reached, but this does not indicate a problem with the scanner itself. Follow the Scanning Master instructions.

6.5 The Document Isn't Properly Fed to the Initial Scanning Position

Cause	Remedy
The target document is curled up, wrinkled, too thin, or otherwise poorly suited to proper feeding.	Load the document after placing it inside the carrier sheet provided (see Section 4.6, "Using the Carrier Sheet").
You are using the document hold-down unit's "High" setting when you should be using the "Standard" setting for a thin document.	Change the "High" setting to "Standard", or, place the document in the carrier sheet provided as a standard accessory.
Dust has accumulated on the paper sensors.	Clean the paper sensors (see Section 5.4, "Cleaning the Paper Sensors").
The document to be scanned may be too thick or heavy.	In such cases, you should support the document with your hand when you insert it into the scanner, or try lowering the scanning speed, or both.

6.6 After Scanning, Image Data Becomes Black or White

Cause	Remedy
The document was loaded with its target surface facing up instead of down.	Load it in the scanner with its target surface (the surface to be scanned) facing down.
The scanning conditions set were inappropriate for the document.	Set the scanning conditions again (they can be controlled from the scanning software provided).

6.7 The Image Quality Has Dropped

Cause	Remedy
The transparent contact plates over the image sensors are dirty	Clean the transparent contact plates (see Section 5.3, “Cleaning the Image Sensors”)
The carrier sheet is not used with transparent or translucent documents.	Use the carrier sheet.

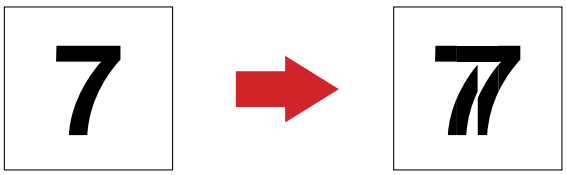
6.8 The Input Image Data Is Incorrectly Aligned

Cause	Remedy
The data is misaligned at a joint between the image sensors. (see the figure on page 6-5)	After opening the Tools menu of the driver program (Scanning Master 21+ driver) provided with your scanner, select the Joint Adjustment function then perform adjustment to achieve a seamless image.

CHECK

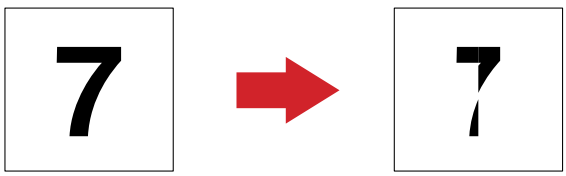
Your scanner comes shipped from the factory after being adjusted for high precision. Due to its operating environment or other factors, however, the scanning precision may deviate in very rare cases.
Moreover, fine adjustment to correct such deviation can be performed using the driver software if the deviation causes are overlapped or missing data.

● **Overlapped data**



Original document　　Data overlaps

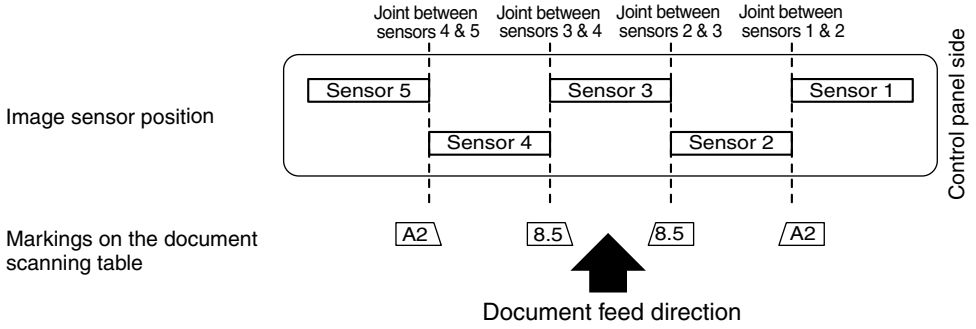
● **Missing data**



Original document　　Data is missing

● **Deviation due to scanner specifications**

Original document　　Deviation caused by specifications



Example: CS2000

CHECKPOINT

Because the document is loaded face down, Sensor 1 is the leftmost sensor in the driver software's display windows.

6.9 Smudges Not Appearing in the Original Document Appear in the Scanned Data

Cause	Remedy
The image scanned has a glossy surface, such as a photograph.	Documents with a glossy surface should be scanned by placing them inside the carrier sheet provided.

6.10 The Image-Data Color Intensity Differs

Cause	Remedy
The scanner contains five contact image sensors, the characteristics of which have been adjusted. However, some variation in color intensity may occur, depending on the type of document scanned.	Adjust the color using the color-correction function in the driver software provided. One adjustment method is to make similar colors all the same color.
The document scanned was creased or curled.	Creased or curled documents should be scanned by placing them inside the carrier sheet provided.

6.11 The Document Length Differs from the Scanned Data Length

Cause	Remedy
Distance correction adjustments have been made to ensure scanning precision for a document of a different paper type. The scanning precision varies according to the type of document.	After opening the Tools menu of the driver program (Scanning Master 21+) provided with your scanner, select the Distance Correction function to adjust the precision.

6.12 Stripes or Moiré Patterns Which Are Not in the Original Document Appear in the Scanned Data

Cause	Remedy
The scanned document contains filled or shaded areas.	Depending on the resolution selected, data that is comprised of filled or shaded areas may be scanned in as stripes or moiré patterns. This is not due to a scanner malfunction. Note, however, that the vividness of the stripe and moiré patterns can be lessened by changing the resolution, and that the driver software included with your scanner (Scanning Master 21+) will help you to reduce the vividness of the moiré patterns by using the Moiré Pattern Removal Radius, the Moiré Pattern Removal Strength and the Moiré Reduction settings in the “Scan window/Adjustments” tab in cases where you are scanning 24-bit colors.

6.13 After Scanning, Image Quality Drops

Cause	Remedy
The scanner’s image scanning quality has deteriorated.	Run the “Scanner Adjustment Program” (see Section 5.6, “Calibration”), and perform calibration.
Is the scanner properly grounded?	Make sure that the scanner is grounded.

6.14 After Scanning, Image Data is Patchy

Cause	Remedy
The scanner’s image scanning quality has deteriorated.	Run the “Scanner Adjustment Program” (see Section 5.6, “Calibration”), and perform calibration.
You are using a carrier sheet with a color document.	Don’t use the carrier sheet. Or, set the document hold-down unit force to “High”.

6.15 The Document Cannot Be Fed Correctly

Cause	Remedy
The document is fed at an irregular rate (resulting in the images being scanned unevenly) or stops feeding half way through.	The cause of this problem is often attributable to the weight or length of the document. In such cases, you should support the document with your hand when you insert it into the scanner, or try lowering the scanning speed, or both.

6.16 “Document Size Cannot Be Acquired” is displayed

Cause	Remedy
The scanner failed to detect the document size automatically.	Load the document again. Select a user-defined document size or standard size if the same problem occurs after a number of retries.

6.17 The Document to be Scanned is Too Short or Too Long in Length

Cause	Remedy
Automatic document size detection was used, but failed.	Load the document again. Select a user-defined document size or standard size if the same problem occurs after a number of retries.

APPENDIX A. OPTIONAL AND MISCELLANEOUS ITEMS

Optional items can be obtained from your sales representative or nearest Graphtec vendor.

Optional items

Code	Item name
OPS115-KIT-E	Software to upgrade OPS112 Scanning Master 21+ to OPS115 Scanning Master Pro Color

Consumables

Code	Item name
IS0907	Carrier sheet (A0)
IS0908	Carrier sheet (A1)
IS0913	Calibration Sheet (A0)
EM-CP	Cleaning paper (50 sheets)

APPENDIX B. STANDARD SPECIFICATIONS

Item	CS400	CS300
Document size	ANSI E to ISO A4 Maximum width: 1090 mm; minimum width: 210 mm	
Effective scanning area	Width : 1016 mm (centered) Length : 16 m*1	
Guaranteed scanning precision range*3	841 mm × 1189 mm	
Document thickness	1.5 mm or less (including the carrier sheet)	
Optical resolution	600 dpi	
Interpolated resolution	50 to 800 dpi, in 1-dpi increments	
Main scanning system	Contact image sensor system (Five A4 sensors in a zigzag pattern)	
Sub scanning system	Document travel (sheet through) system	
Scanning speed*2	Monochrome: Approx. 0.55 ms/line 9 ips at 400 dpi Color: Approx. 1.65 ms/line 3 ips at 400 dpi	
Scanning precision*3	±0.1%, ±5 pixels	
Gradation	Monochrome: Bilevel, intermediate tones (dithering, error diffusion) Gray : 256 shades	
	Color: 8-bit, 24-bit	8-bit
Threshold value	Digital signal processor enables automatic setting of the threshold value (monochrome scans only)	
Color space	sRGB compatible	
Light source	LED (RGB)	
Interface*4	USB 2.0, IEEE 1394	
Output	Image data	
Rated power supply	100 to 120/200 to 230 VAC ±10%, 50/60 Hz	
Operating environment	Temperature: 10°C to 35°C Humidity: 35% to 80% RH (non-condensing)	
Power consumption	135 VA or less (60 W or less)	
External dimensions (approx.)	1205×957×715 mm (W×H×D) (including stand)	
Weight	Approx. 40 kg (including stand)	

*1 Documents up to approximately 16 m in length (driver software limitation) can be scanned. However, the actual document length that can be scanned is limited by the available memory (hard disk or other data storage device) of the computer to which the scanner is connected, and also by the grade of the medium being scanned.

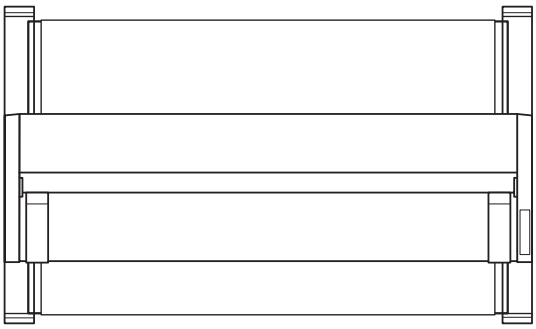
*2 Excluding data-transfer time

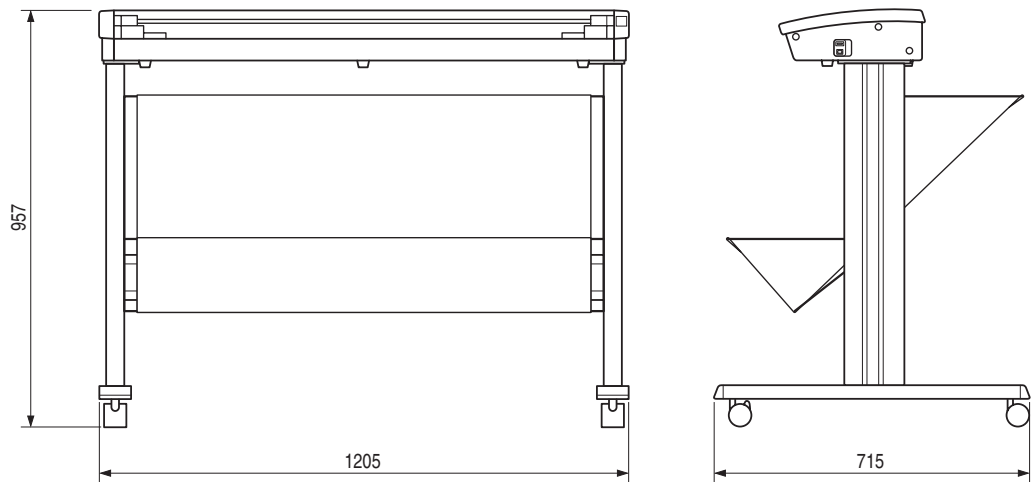
*3 Notes on scanning precision
Scanning precision may vary slightly depending on the grade and thickness of the medium being scanned, and on the operating conditions. The precision figures above were measured under the operating conditions described below.
- Test chart used : Mylar sheet #200
- Guaranteed precision conditions : Temperature 20 ±3°C; humidity: 60% ±10% RH
- Document hold-down unit setting : Standard

*4 The USB 2.0 and IEEE 1394 interfaces cannot be used at the same time.

APPENDIX C. EXTERNAL VIEW

External Dimensions





Note: The diagrams are of the CS400 model.

Unit : mm
Dimensional precision error : ±5 mm

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The specifications, etc., in this manual are subject to change without notice.

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