ABB Robotics

Product manual
USB disk drive replacement kit



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Product manual

USB disk drive replacement kit

1.0

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Manual overview

About this manual

This manual provides an overview and describes the installation of the USB disk drive replacement kit.

Usage

This manual should be used during the installation of the USB disk drive replacement kit.

Who should read this manual

This manual is intended for the qualified Field Service Engineers (FSEs) at ABB.

Prerequisite

The reader should have knowledge of the mechanical and electrical installation of S4, S4C, and S4C plus controllers.

Organization of chapters

This manual is organized into the following chapters:

Chapter	Contents
Safety	Important safety information that must be read before any installation or service of the control cabinet.
Introduction	Introduction to the installation of the USB disk drive replacement kit.
Setting up the USB disk drive replacement kit	Describes the procedure for installing, formatting, and using the USB disk drive replacement kit.
Spare parts list	Includes the list of spare parts.

References

Reference
S4 (M94-M96) - User's Guide BaseWare OS 2.x
S4C (M97-M99) - User's Guide BaseWare OS 3.x
S4CPlus (M2000) - User's Guide BaseWare OS 4.0.xx

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Revisions

Revision	Description
-	First edition
A	Updated the manual by fixing the following errors reported: • Supported operating systems. See *Supported controller versions and operating systems on page 15*. • Format USB Flash Disk using format tool software. See *Formatting the USB Flash Disk using the format tool software on page 20*. • Format USB Flash Disk using DOS. Added a note. See *Formatting the USB Flash Disk using DOS on page 24*.
B	Updated the manual by fixing the following error reported: • Downloading options for format tool software. See *Formatting the USB Flash Disk using the format tool software on page 20*. • Added a note about the length of file and directory name. See *Formatting the USB Flash Disk using the format tool software on page 20*
C	• Added the procedure on format tool software (Version 1.3). See *Formatting the USB Flash Disk using the format tool software on page 20*. • Added a note on Version 1.3 supporting 16+3 characters in the section *Formatting the USB Flash Disk using the format tool software on page 20*. • Updated the procedures on format tool softwares by adding steps to copy the data to USB partition and creating a directory in the PC and copying the data from the USB to PC.

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Product documentation, IRC5

Categories for manipulator documentation

The manipulator documentation is divided into a number of categories. This listing is based on the type of information in the documents, regardless of whether the products are standard or optional.

All documents listed can be ordered from ABB on a DVD. The documents listed are valid for IRC5 manipulator systems.

Product manuals

Manipulators, controllers, DressPack/SpotPack, and most other hardware will be delivered with a **Product manual** that generally contains:

- Safety information.
- Installation and commissioning (descriptions of mechanical installation or electrical connections).
- Maintenance (descriptions of all required preventive maintenance procedures including intervals and expected life time of parts).
- Repair (descriptions of all recommended repair procedures including spare parts).
- Calibration.
- Decommissioning.
- Reference information (safety standards, unit conversions, screw joints, lists of tools).
- Spare parts list with exploded views (or references to separate spare parts lists).
- Circuit diagrams (or references to circuit diagrams).

Technical reference manuals

The technical reference manuals describe reference information for robotics products.

- *Technical reference manual - Lubrication in gearboxes*: Description of types and volumes of lubrication for the manipulator gearboxes.
- *Technical reference manual - RAPID overview*: An overview of the RAPID programming language.
- *Technical reference manual - RAPID Instructions, Functions and Data types*: Description and syntax for all RAPID instructions, functions, and data types.
- *Technical reference manual - RAPID kernel*: A formal description of the RAPID programming language.
- *Technical reference manual - System parameters*: Description of system parameters and configuration workflows.

Application manuals

Specific applications (for example software or hardware options) are described in **Application manuals**. An application manual can describe one or several applications.

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Continued

An application manual generally contains information about:

- The purpose of the application (what it does and when it is useful).
- What is included (for example cables, I/O boards, RAPID instructions, system parameters, DVD with PC software).
- How to install included or required hardware.
- How to use the application.
- Examples of how to use the application.

Operating manuals

The operating manuals describe hands-on handling of the products. The manuals are aimed at those having first-hand operational contact with the product, that is production cell operators, programmers, and trouble shooters.

The group of manuals includes (among others):

- *Operating manual - Emergency safety information*
- *Operating manual - General safety information*
- *Operating manual - Getting started, IRC5 and RobotStudio*
- *Operating manual - Introduction to RAPID*
- *Operating manual - IRC5 with FlexPendant*
- *Operating manual - RobotStudio*
- *Operating manual - Trouble shooting IRC5*, for the controller and manipulator.

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1 Safety

1.1 General safety information

Read safety chapter in controller manual

Before starting to work with the robot system, make sure you are familiar with the safety regulations described in the product manual for the controller, see *References on page 7*.

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1.2 DANGER

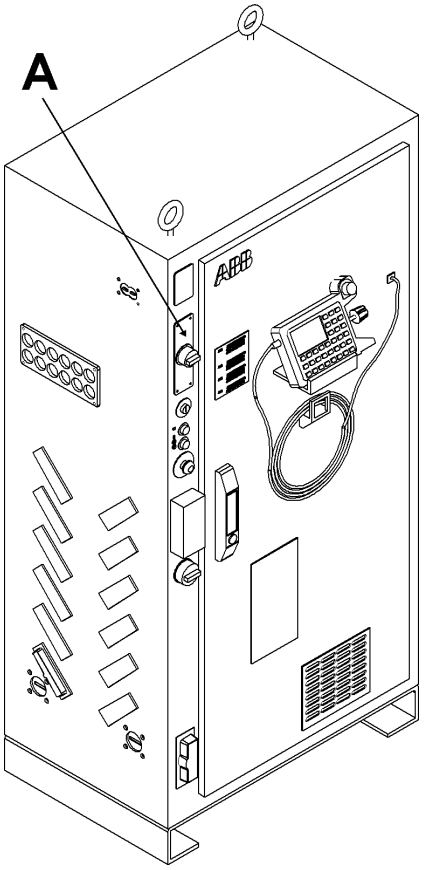
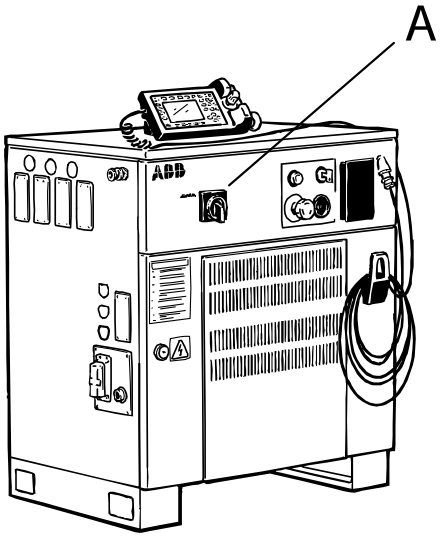
Description

Working with high voltage is potentially lethal. Persons subjected to high voltage may suffer cardiac arrest, burn injuries or other severe injuries. To avoid these dangers, do not proceed to work before eliminating the danger as described in the following section.

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Elimination, S4, S4C, and S4C plus controller

	Action	Note/Illustration
1	Switch off the main switch on the controller.	 S4 Controlle A: Main switch  S4Cplus cont **Note** Location of the main switch on both *S4C* and *S4C plus* controllers are the same.

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2 Introduction

2.1 Introduction to the USB disk drive replacement kit

Overview

This chapter provides an overview of the USB disk drive replacement kit.

Supported controller versions and operating systems

The USB disk drive replacement kit supports:

- C5.3,S4, S4C, S4P, S4C plus, S4P plus controller versions
- Windows Vista, Windows XP, and Windows 7 (32 Bit and 64 Bit)

Concept

The USB disk drive replacement kit is a complete packaged upgrade solution that replaces the existing floppy disk drive units with the USB disk drive units. It allows for the transfer of all the stored programs and data to a standard USB Flash Disk and connection to a PC.

The USB disk drive replacement kit is a safer way of storing data. While programs and data are among the most valuable parts of a robot system, they are often stored in 3.5-inch floppy disks. Since the life expectancy of a floppy disk drive is less than one-third of the rest of the robot system, there is every chance of it failing and corrupting the stored programs and data. By using the USB disk drive replacement kit you can safeguard the vital robot data.

Benefits of the USB disk drive replacement kit

These are the key benefits of using the USB disk drive replacement kit:

- Replaces 3.5-inch drives or boxes of disks
- Faster transfer rate and lower risk of data loss
- Ideal for cold booting and program selection
- Large storage capacity – equivalent to 100 floppy disks
- Plug compatible – supplied with fittings



Note

The USB disk drive replacement kit supports up to 100 virtual disks on each USB Flash Disk. The desired virtual disk can be selected by changing the channel (00 to 99) using the Up and Down buttons on the front panel of the kit.

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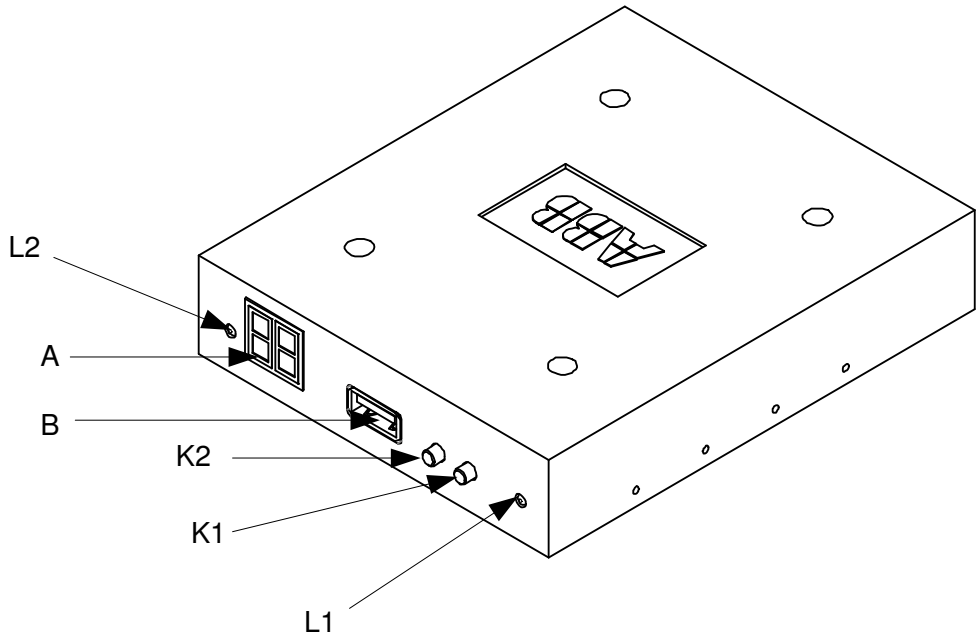
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2.1 Introduction to the USB disk drive replacement kit

Continued

Hardware description

The following graphic shows the front panel of the USB disk drive replacement kit.



en1000000324

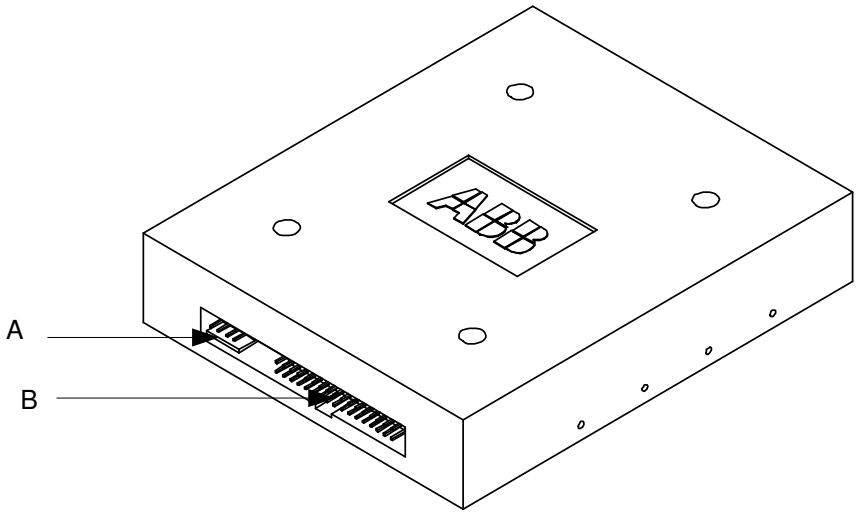
A	LED display
B	USB port
L1	Green light. Power on indicator.
L2	Red light. Indicates the status of the USB kit. If the light is bright, it indicates that the USB kit is working (accessing data or transferring data).
K1 and **K2**	Up and Down buttons to change the channels. Press **K1** to increase the counter (00 to 99) Press **K2** to decrease the counter (99 to 00)

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Continued

The following graphic shows the back panel of the USB disk drive replacement kit.



en1000000325

A	Slot to insert the 5V power cable
B	Slot to insert the 34-pin data cable

Note

Do not open the USB disk drive replacement kit. If opened, the warranty is void.

The USB disk drive replacement kit has a total of 6 jumpers inside (J1, J2, J3, J4, J5, and J6).

- By factory settings, jumper pins 2 and 3 of J2 are short, while the other jumpers are open.
- By default, jumper pins 1 and 2 of J5 are open.

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3 Setting up the USB disk drive replacement kit

3.1 Installing the USB disk drive replacement kit

Procedure for installing the USB disk drive replacement kit

The following procedure provides information about installing the USB disk drive replacement kit on the robot controllers.

	Action	Description
1	Switch off the power on the controller cabinet and remove the floppy disk drive.	
2	Connect the USB kit to the controller.	**Note** • Insert the USB kit in the same slot as provided for the floppy disk drive. • Use the same 5V power cable and 34-pin data cable as used in the floppy disk drive to connect the USB kit to the controller. **Note** • Connect the 5V power cable before connecting the 34-pin data cable. • Disconnect the 34-pin data cable before disconnecting the 5V power cable.
3	Switch on the power on the controller.	The green light on the USB kit is switched on and the LED displays **c4**. If the LED displays **EX**, there is an error. Check whether the power cable and the data cable are connected correctly.

CAUTION

Be careful,

- when connecting the 5V power cable in the slot. The pin can be damaged if the cable is inserted incorrectly.
- when connecting the 34-pin data cable in the slot. Check for the groove and the position of the slot before connecting the data cable; it can be damaged if inserted incorrectly. The red light on the USB kit is switched on when wrongly connected.

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3.2 Formatting the USB Flash Disk

Overview

Format the USB Flash Disk before using it. It can be formatted in the following ways:

- By using the format tool software. See *Formatting the USB Flash Disk using the format tool software on page 20*.
- By using DOS. See *Formatting the USB Flash Disk using DOS on page 24*.

Formatting the USB Flash Disk using the format tool software

The USB Flash disk can be formatted using the following versions of format tool software:

- Version 1.1 (valid for Windows XP and Windows 7, 32 Bit)
- Version 1.2 (valid for Windows 7, 64 Bit)
- Version 1.3 (valid for Windows 2000, XP, Vista, 7, 8, Server 2003 and Server 2008, 32 Bit and 64 Bit)

Note

- The format tool softwares *V1.1 UFloppyManagerII-ABB-EN.exe* and *V1.2 UFloppyManagerII-ABB-EN.exe* does not support *file* and *directory* names longer than 8 characters (and 3 characters as extension). That is, names having 16 characters (and 3 characters as extension) are not supported. For example, *FDD-USB_Software.mod*.
- The format tool softwares *UFloppyManagerV131_OEM.exe* supports *file* and *directory* names having 16 characters (and 3 characters as extension). For example, *FDD-USB_Software.mod*.
- S4 and S4C controllers support *file* and *directory* names having a maximum of 8 characters (and 3 characters as extension).
- S4C+ controller supports *file* and *directory* names having 16 characters (and 3 characters as extension).

Note

You should have *Administrator rights* to install the format tool software.

WARNING

Do not remove the USB Flash Disk without stopping the service driver.

Formatting the USB Flash Disk using the format tool software (Version 1.1)

Use this procedure to format the USB Flash Disk using the format tool software (Version1.1).

	Action	Description
1	Insert the USB Flash Disk into the PC.	

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Continued

	Action	Description
2	Double-click **V1.1 UFloppyManagerII-ABB-EN.exe**	**Note** You can download the format tool software *V1.1 UFloppyManagerII-ABB-EN.exe* in either of the following ways: • Go to ABB Library and search for *FDD-USB manager software*. • Go to www.abb.com ->Products and services ->Robotics ->Service & Support ->Spare Parts ->Software ->V1.1 UFloppyManagerII-ABB-EN.rar.
3	Right-click **My Computer**, select **USB**.	The Format floppy disk dialog box appears.
4	Select floppy format as **1.44M** and number of partitions as **100**.	**Note** By default, a maximum of 100 partitions can be created.
5	Click **Start**.	The formatting process starts.
6	Right-click the partition and select "**Batch format floppy disks...**"	
7	Select **1.44M** and click **OK**.	The USB Flash Disk is now formatted into multiple partitions depending on the number of blocks selected.
8	Select the partition to which you want to transfer the data.	
9	Double-click the partition.	The Explorer window opens.
10	Copy the data to the USB partition.	The data will be used in the robot controller.
11	Create a directory in the PC and copy the data from the USB to it.	**Note** • The directory created by the tool is temporary. • Always remember to save the data in the directory that you created. If not, the changes will not be saved.
12	Right-click the partition and select **Save**.	**Note** • If you delete the data, always remember to save, if not, the content will not be deleted. • Ensure you save the *file* and *directory* with a name that has a maximum of 8 characters (and 3 characters as extension). For example, *UI_Flopy.mod*. *File* and *Directory* names having more than 8 characters will get corrupted while saving the data.

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Formatting the USB Flash Disk using the format tool software (Version 1.2)

Use this procedure to format the USB Flash Disk using the format tool software (Version1.2).

Note

For systems running on Windows7, 64 bit; while starting the computer, press **F8** and select **Advance boot options --> Disable Driver Signature Enforcement**. This option remains *active* until you restart the system.

	Action	Description
1	Insert the USB Flash Disk into the PC.	
2	Double-click **V1.2 UFloppyManagerII-ABB-EN.exe**	**Note** You can download the format tool software *V1.2 UFloppyManagerII-ABB-EN.exe* in either of the following ways: • Go to ABB Library and search for *FDD-USB manager software* • Go to www.abb.com ->Products and services ->Robotics ->Service & Support ->Spare Parts ->Software ->V1.2 UFloppyManagerII-ABB-EN.rar.
3	Right-click **My Computer**, select **USB**.	The Format floppy disk dialog box appears.
4	Select floppy format as **1.44M** and number of partitions as **100**.	**Note** By default, a maximum of 100 partitions can be created.
5	Click **Start**.	The formatting process starts.
6	Right-click the partition and select "**Batch format floppy disks...**"	
7	Select **1.44M** and click **OK**.	The USB Flash Disk is now formatted into multiple partitions depending on the number of blocks selected.
8	Select the partition to which you want to transfer the data.	
9	Double-click the partition.	The Explorer window opens.
10	Copy the data to the USB partition.	The data will be used in the robot controller.
11	Create a directory in the PC and copy the data from the USB to it.	**Note** • The directory created by the tool is temporary. • Always remember to save the data in the directory that you created. If not, the changes will not be saved.

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Continued

	Action	Description
12	Right-click the partition and select **Save**.	**Note** • If you delete the data, always remember to save, if not, the content will not be deleted. • Ensure you save the *file* and *directory* with a name that has a maximum of 8 characters (and 3 characters as extension). For example, *UI_Flopy.mod*. *File* and *Directory* names having more than 8 characters will get corrupted while saving the data.

Formatting the USB Flash Disk using the format tool software (Version 1.3)

Use this procedure to format the USB Flash Disk using the format tool software (Version1.3).

Note

For systems running on Windows Vista, Windows 7, and Windows 8, 32 bit and 64 bit; you need to run the batch file *QH_UFDD\InstallSFDService.bat* to install service as *Administrator*. If not, the format tool software *UFloppyManagerV131_OEM.exe* will not work.

	Action	Description
1	Insert the USB Flash Disk into the PC.	
2	Double-click **UFloppyManagerV131_OEM.exe**	**Note** You can download the format tool software *UFloppyManagerV131_OEM.exe* in either of the following ways: • Go to ABB Library and search for *FDD-USB manager software* • Go to www.abb.com ->Products and services ->Robotics ->Service & Support ->Spare Parts ->Software ->UFloppyManagerV131_OEM.rar.
3	Right-click **My Computer**, select **USB**.	The Format floppy disk dialog box appears.
4	Select floppy format as **1.44M** and number of partitions as **100**.	**Note** By default, a maximum of 100 partitions can be created.
5	Click **Start**.	The formatting process starts.
6	Right-click the partition and select **"Batch format floppy disks..."**	
7	Select **1.44M** and click **OK**.	The USB Flash Disk is now formatted into multiple partitions depending on the number of blocks selected.

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Continued

	Action	Description
8	Select the partition to which you want to transfer the data.	
9	Double-click the partition.	The Explorer window opens.
10	Copy the data to the USB partition.	The data will be used in the robot controller.
11	Create a directory in the PC and copy the data from the USB to it.	**Note** • The directory created by the tool is temporary. • Always remember to save the data in the directory that you created. If not, the changes will not be saved.
12	Right-click the partition and select **Save**.	**Note** • If you delete the data, always remember to save, if not, the data will not be deleted. • The format tool software *UFloppyManagerV131_OEM.exe* supports *file* and *directory* names having 16 characters (and 3 characters as extension).

Formatting the USB Flash Disk using DOS

The following procedure describes the formatting of the USB Flash Disk using DOS.

Note

This is possible only when the kit is installed into a PC.

	Action	Description
1	Insert the USB Flash Disk into the USB port of the USB kit.	The LED displays **00** which means the disk is now being formatted for **00**. **Note** Before inserting the USB Flash Disk, by default, the LED displays **c4.**
2	Go to command prompt and type **Format A:**.	The message **Insert new disk for drive A: and press ENTER when ready**appears.
3	Press **Enter**.	The message **The type of the file system is FAT. Verifying 1.44M** appears. The formatting status appears. **Note** The message **Volume label <11 characters, ENTER for none>?** appears.
4	Type a name for the volume label.	For example, **FLPPY0**.

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Continued

	Action	Description
5	Press **Enter**.	The message **Format complete** appears. **Note** The message **Format another <Y/N>?** appears.
6	Type **Y** and press **Enter** to format another block. or Type **N** to stop formatting.	If **Y** is typed, the message **Insert new disk for drive A: and press ENTER when ready** appears.
7	Press **K1** until the LED displays **01**.	The disk is now formatted for the next block **01**.
8	Repeat steps 3 to 6 to format **01**.	**Note** You can create a maximum of 100 multiple-floppy blocks (00 to 99) by repeating steps 3 to 7.

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3.3 Using the USB disk drive replacement kit

Overview

The USB disk drive replacement kit is used to perform the following:

- Backup and restore. See *Performing backup and restore using the USB disk drive replacement kit on page 26*.
- Boot or restart. See *Booting the controller using the USB disk drive replacement kit on page 26*.

Performing backup and restore using the USB disk drive replacement kit

The following procedure describes performing backup and restore using the USB disk drive replacement kit.

Note

You should have knowledge of performing backup and restore using the S4 and S4C controllers having a Floppy Disk Drive (FDD).

	Action	Description
1	Install the USB kit in the controller.	See *Procedure for installing the USB disk drive replacement kit on page 19*. The LED displays **00** which means the channel **00** is ready.
2	Connect the formatted USB Flash Disk to the USB port of the USB kit.	See *Formatting the USB Flash Disk on page 20*.
3	Perform backup and restore.	The backup and restore method is the same as in the S4 and S4C controllers using FDD. See *User's Guide BaseWare OS 2.x* for S4 controller. See *User's Guide BaseWare OS 3.x* for S4C and S4C plus controller.

Booting the controller using the USB disk drive replacement kit

The following procedure describes booting the controller using the USB disk drive replacement kit.

Note

You need to have knowledge of booting the S4 and S4C controllers having a Floppy Disk Drive (FDD).

	Action	Description
1	Install the USB kit in the controller.	See *Procedure for installing the USB disk drive replacement kit on page 19*.
2	Connect the formatted USB Flash Disk to the USB port of the computer.	For information on formatting the USB Flash Disk, see *Formatting the USB Flash Disk on page 20*.
3	Copy the robot boot disk data to the formatted USB Flash Disk.	

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Continued

	Action	Description
4	Boot or restart the controller.	The booting method is the same as in the S4 and S4C controllers using FDD. See *User's Guide BaseWare OS 2.x* for S4 controller. See *User's Guide BaseWare OS 3.x* for S4C controller. **Note** Instead of using the floppies to access the boot disk data from the controllers, press **K1** or **K2** to select the required floppy blocks for accessing the boot disk data. For example, when the controller asks for disk4, press **K1** until the LED displays **04** instead of inserting floppy disk4 and proceed with the booting process.

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4 Spare parts list

4.1 Spare parts

Parts list

Item	Description	Spare part number
1	FDD-USB kit	3HAC041840-001
2	USB Flash Disk	3HAC038143-004
3	FDD-USB unit	3HAC041748-001

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