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# *Dispenser Software Recovery Guide*

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*for dispense system models:*

- DS Series Dispensers
- MAX Series Dispensers

*for use with:*

- FLOWare® Software version 2.9.3S

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# Best Practices for USB Backup & Recovery

## Disaster Recovery

Maintain a USB Recovery device for each dispenser. This allows the restoration of a system to a new hard disk without the need for any other devices.

Follow the [Disaster Recovery](#) (pg 6) instructions to make a system backup to USB that includes a USB Recovery image; it takes two to three minutes. In the event of a disaster, such as a complete hard disk failure, you can boot from a single USB flash drive and restore an operable system within five minutes.

## Backup Frequency

As a part of [Normal Operations](#) (pg 3), create system backups on a regular basis (daily, weekly, etc.) or when the program database has been modified.

## Create a 'Hot' Backup Hard Disk

If your dispenser is equipped with two SSD disks, the secondary disk may be maintained as a 'Hot' backup disk.

1. Create a system backup to a USB flash drive. Refer to [Back Up System to USB](#) (pg 3).
2. Restore that backup to the secondary hard drive (`/dev/hd1`) on the system. Refer to [Restore Backup to Alternate Hard Drive](#) (pg 6).

When needed, simply remove the failed primary drive and reboot the system. The secondary drive will automatically become the new primary drive.

The process of creating a backup and restoring it to the secondary drive requires minimal time. On a system with a very large program database (in excess of 200 MB), this process takes less than five minutes. In addition to creating a bootable backup disk, you've also created a backup on the USB device.

## Requirements

### User Qualifications

These instructions are intended for users who are reasonably familiar with installing software.

### System Requirements

The following requirements are typically set up and created at the factory.

### Utilities

The following utility must be enabled in ds.options.cfg. This is a factory setting.

```
USBUtilsInstalled = True (This is in the General Section)
```

### QNX Boot USB

The QNX Boot USB is created at the factory. For details, see [Create USB Boot Device \(QNX\)](#) (pg 12).

## Normal Operations

### Backing Up System

#### Backup Structure

- Each dispense system is assigned a unique name, and that name is used to collect back-ups from that particular system.
- Each backup is named with the full date/time at which it is created.
- Multiple backups of multiple systems can be stored on a single USB flash drive.
- The backup program creates the following file structure on the USB flash drive:

**Example:** GPD-FLOWare/SystemBackups/GpdPhaseI/20180906-1437

- where directory GpdPhaseI corresponds to the name of the dispenser.
- where 20180906-1437 is the date (YYYYMMDD) and time of the backup.

#### Back Up System to USB

The following instructions describe how to perform a full system backup to a USB device. The system will read from the hard drive and then write to the USB flash drive.

**REQUIRED:** FAT32 formatted USB flash drive

To backup a dispense system from FLOWare®Software with USBUtilsInstalled to a USB flash drive:

1. Insert a FAT32 formatted USB flash drive in USB port 0 or 1.
2. From the menu bar on the Main Control Panel, click Utilities > Backup Utilities > Backup System to USB. When the following prompt displays.

```
*Valid USB Backup Device detected - nn% used
```

**NOTE:** If the USB flash drive is not FAT32 formatted or does not initialize, an error message will display indicating that a FAT32 formatted disk must be inserted.

```
Create a new System Backup on the USB? (Y/n)
```

3. Type Y and press ENTER. The backup process begins. All files from the system hard drive are captured to the USB flash drive.

**IMPORTANT:** This process can take several minutes - do not remove the USB flash drive until the operation is completed.

4. When prompted, remove the USB flash drive.
5. Press ENTER to exit.

## Capturing Diagnostics

This feature captures dispenser FLOWare® Software system data, configuration, and operating log files to a USB device.

A diagnostics archive includes:

- User Configuration Files,
- Input/Output Configuration Files,
- System Libraries, and
- Custom Logic and Controllers

Additionally, all current database information used by the dispenser is saved:

- Programs
- Shapes
- Materials
- Material Defaults
- Heads
- Classes
- Needles
- Vision Patterns
- Cross References
- Management Info
- Notes
- Fixed Locations
- Universal Options
- SubTypesError Log
- Base Info
- Base Locations
- internals

### How To Capture Diagnostics to USB

To capture system diagnostics to a USB flash drive:

**REQUIRED:** FAT32 formatted USB flash drive

1. Change the system password to an access right that permits access to Backup.
2. Insert a USB flash drive into a USB ports.

**NOTE:** If the USB flash drive is not FAT32 formatted or does not initialize, an error message will display indicating that a FAT32 formatted disk must be inserted.

3. From the menu bar on the Main Control Panel, click Utilities > Backup Utilities > Capture Diagnostics to USB.
4. When the following prompt displays...

```
Create a new System Backup on the USB? [Y/n]
```

- Type Y and press ENTER. The process begins.

**IMPORTANT:** This process can take several minutes - do not remove the USB flash drive until the operation is completed.

A backup of the FLOWare® Software database is created. All relevant files are copied into a ZIP file on the USB flash drive.

- When prompted, remove the USB flash drive.

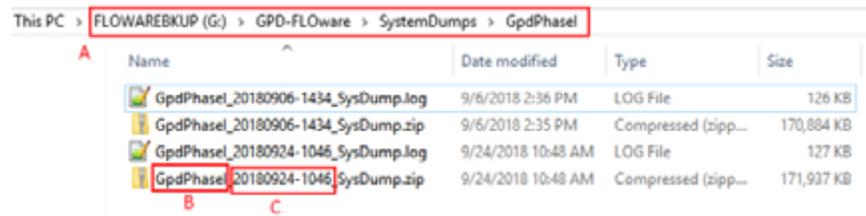
## Results of Capture

When system diagnostics are captured, all relevant files are copied into a ZIP file on the USB flash drive using the following directory structure:

GPD-FLOWare\SystemDumps\\_\_{SystemName}\_

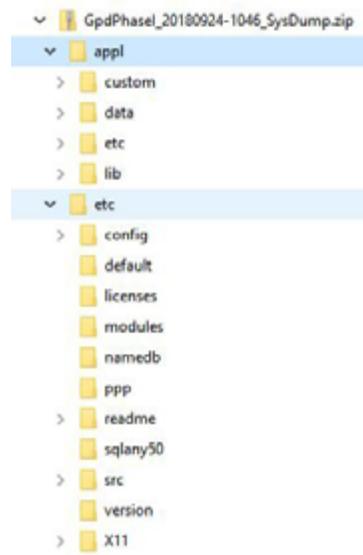
where {SystemName} is the actual name of the dispenser (the serial number of the dispenser is typically used).

In Windows Explorer, this directory structure looks like this:



- A Path to folder containing System Diagnostics archives
- B ZIP archive machine name
- C ZIP archive data stamp

### Example: ZIP content



## Disaster Recovery

- [Restoring System](#) (pg 6)
  - [Restore Backup to Alternate Hard Drive](#) (pg 6)
  - [Restore Backup from Recovery and Backup USBs](#) (pg 7)
- [Recovering System](#) (pg 9)
  - [Create Recovery USB](#) (pg 9)
  - [Recover System](#) (pg 10)
- [Create USB Boot Device \(QNX\)](#) (pg 12)
- [Capture USB Boot Image](#) (pg 12)

## Restoring System

Restoring a system from a USB backup will create a new, bootable disk image on a secondary hard disk mounted in the system.

**NOTE:** One cannot *restore* a backup to a running system because a restore always targets the secondary (or tertiary) hard disk.

### Restore Backup to Alternate Hard Drive

This process reads the contents of a USB flash drive and writes it onto the inactive dispense system hard drive of your choice.

**PREREQUISITES:**

- Backup USB - see [Backing Up System](#) (pg 3)
- FLOware® Software Recovery USB - see [Create Recovery USB](#) (pg 9)

To restore a backup from your FLOware® Software Recovery USB and Backup USB:

1. Insert the Backup USB into USB port 1.
2. From the menu bar on the Main Control Panel, click Utilities > Backup Utilities > Restore Backup From USB to Alternate Hard Drive.

When a suitable USB flash drive is detected, a list of target hard disk devices displays. Typically, only a single alternate device is present: /dev/hd1

3. Select the backup to be restored:
  - a. When prompted, select a **hard drive** onto which the backup will be copied.
  - b. When prompted, select the **serial number** of the backup you want to restore.
  - c. When prompted, select the **date/time** of the backup you want to restore.
  - d. When prompted to exit, press ENTER.

The selected backup will be restored to the inactive hard drive (the hard drive you are NOT currently booted up on).

4. When the backup is fully restored, press ENTER to exit.
5. Remove the USB flash drive.
6. Power off the dispenser.
7. As needed, use the alternate hard drive as the primary drive either by changing the boot order in BIOS or by manually swapping the drives between bays.

## Restore Backup from Recovery and Backup USBs

This procedure restores a system, without using its hard drives, from a system backup using a USB boot device. Use this process if both hard drives are new and you want to restore the system to the latest backup.

### **PREREQUISITES:**

- Backup USB - see [Backing Up System](#) (pg 3)
- FLOware® Software Recovery USB - see [Create Recovery USB](#) (pg 9)

1. Verify the dispenser is powered off.
2. Insert the FLOware® Software Recovery USB into USB port 0.
3. Insert the Backup USB into USB port 1.
4. Power on the dispenser.
5. Enter the BIOS by pressing the DEL key while the system powers up.
6. To prepare the system to boot from the FLOware® Software Recovery USB:
  - a. Use the arrow keys to select **Advanced BIOS Features** and then press ENTER.
  - b. Use the arrow keys to select **Hard Disk Boot Priority** and then press ENTER.
  - c. Use the arrow keys to select **USB-HDD0**.
  - d. Use the PG UP key to move **USB-HDD0** to the top (number one) position.

**NOTE:** This setting establishes the USB flash drive used to boot the machine.

- e. Press F10 to exit and save BIOS settings.
- f. Type Y to Save to CMOS and Exit.
- g. Press ENTER to execute. The computer will boot from the FLOware® Software Recovery USB.

**IMPORTANT:** This process can take several minutes - do not remove the USB flash drive until the operation is completed.

7. To access the recovery/restore system:
  - a. At the login: prompt, type:

```
root
```

and press ENTER to continue.

- b. At the password prompt, type:

```
glue
```

and press ENTER to continue.

- a. At the # prompt, type:

```
restore-system
```

and press ENTER to continue. Backups will be copied from the Backup USB.

8. Select the backup to be restored:
  - a. When prompted, select the **hard drive** to which you want to restore.
  - b. When prompted, select the **serial number** of the backup you want to restore.
  - c. When prompted, select the **date/time** of the backup you want to restore. The selected backup will be restored to the hard drive that you selected in [Step a](#). When the process is complete, the # prompt will display.
9. Remove both USB flash drives.
10. Reboot the system by either pressing the Reset button on the computer or powering the dispenser off and on.
11. Enter the BIOS and select the hard drive that was just restored as the #1 boot device.
12. Exit and save BIOS. Your system is now Restored.

## Recovering System

Create a complete system backup on a bootable USB flash drive. This allows you, in the event of a catastrophic hard disk failure, to boot from a USB device and restore a system with no other devices/disks. This process returns the system to factory settings.

### Create Recovery USB

In the event the FLOWare®Software will not boot, make a FLOWare®Software Recovery USB for use in the dispense system recovery process.

**PREREQUISITE:** QNX Boot USB - see [QNX Boot USB](#) (pg 2)

To create a FLOWare®Software Recovery USB:

1. Mount the QNX Boot USB in either USB port.
2. From the menu bar on the Main Control Panel, click Utilities > Backup Utilities > Make USB Recovery. When the following prompt displays...

```
Create a new System Recovery point on the USB? [Y/n]
```

3. Type Y and press ENTER. When operations begin, progress will display.

**IMPORTANT:** This process can take several minutes - do not remove the USB flash drive until the operation is completed.

4. When prompted, remove the USB flash drive.

Creation of the FLOWare®Software Recovery USB is now complete and can be used to recover your dispense system as of this point in time. Refer to [Recover System](#) (pg 10).

## Recover System

The recovery process reads the contents of the USB and writes the factory recovery state to the primary dispense system hard drive.

**PREREQUISITE:** FLOWare® Software Recovery USB - see per [Create Recovery USB](#) (pg 9).

To restore a dispense system:

1. If not already created, create a FLOWare® Software Recovery USB.
2. Verify the dispenser is powered off.
3. Insert the FLOWare® Software Recovery USB in USB port 1.
4. Power on the dispenser.
5. Enter the BIOS by pressing the DEL key while the system powers up.
6. To prepare the system to boot from the FLOWare® Software Recovery USB:
  - a. Use the arrow keys to select **Advanced BIOS Features** and then press ENTER.
  - b. Use the arrow keys to select **Hard Disk Boot Priority** and then press ENTER.
  - c. Use the arrow keys to select **USB-HDD0**.
  - d. Use PG UP to move **USB-HDD0** to the top (number one) position.
  - e. Press F10 to exit and save BIOS settings.
  - f. Type Y to Save to CMOS and Exit.
  - g. Press ENTER to execute. The computer will reboot and start the recovery process. This process may take several minutes to complete.
7. To access the recovery/restore system:
  - a. At the login: prompt, type:

```
root
```

and press ENTER to continue.

- b. At the password prompt, type:

```
glue
```

and press ENTER to continue.

- c. At the # prompt, type:

```
recover-system
```

and press ENTER to continue.

- d. When the following prompt displays...

Continue? [Y/n]

Type Y and press ENTER. System recovery onto the primary hard drive begins. This process may take several minutes to complete. When recovery is complete, the # prompt displays.

**NOTE:** System recovery is created on HDD0 if there is a working hard drive installed in bay 1; otherwise, system recovery is created on HDD1 if both of the following conditions are met:

- a working hard drive is installed in bay 2
- no working hard drive is present in bay 1.

8. To confirm the system is booting from the primary hard drive:
  - a. Remove the FLOWare® Software Recovery USB from USB port.
  - b. Reboot the system by either pressing the Reset button on the computer or powering the dispenser off and on.
  - c. Enter the BIOS by pressing the DEL key while the system powers up.
  - d. Use the arrow keys to select **Advanced BIOS Features** and then press ENTER.
  - e. Use the arrow keys to select **Hard Disk Boot Priority** and then press ENTER.
  - f. Use the arrow keys to select **CH0M**.
  - g. Use the PG UP key to move **CH0M** to the top (number one) position.
  - h. Press F10 to exit and save BIOS settings.
  - i. Type Y to Save to CMOS and Exit.
  - j. Press ENTER to execute. The computer will reboot to the factory recovery state.

## Create USB Boot Device (QNX)

The Make Boot USB command creates a USB boot device suitable for use in recovering from a catastrophic disk failure.



**CAUTION:** Creating a USB boot device will **DESTROY ALL CONTENT ON THE USB DEVICE** and, furthermore, that USB device is **NOT USABLE ON ANY WINDOWS/MSDOS** system. Mounting a FLOWare®Software boot device on a Windows10™ system will likely render that USB device unusable.

**IMPORTANT:** The QNX software boot device is **created at the factory** with this procedure and is available, as needed, on request.

**REQUIRED:** blank USB flash drive

To create a QNX Boot USB:

**IMPORTANT:** The QNX Boot USB is only used during the [Create Recovery USB](#) (pg 9) procedure where it is used to create a new recovery USB from a working dispenser.

1. From the menu bar on the Main Control Panel, click Utilities > Backup Utilities > Make Boot USB.
2. When prompted, mount a blank USB flash drive. When the following prompt displays...

```
Are you sure [Y/n]
```

3. Type Y and press ENTER. The process begins.

**IMPORTANT:** This process can take several minutes - do not remove the USB flash drive until the operation is completed.

4. When prompted, remove the USB flash drive.
5. Press ENTER to exit.

Creation of the QNX Boot USB is now complete.

## Capture USB Boot Image

This feature does NOT create a backup for restoration purposes. It captures the boot image from which bootable USB drives are created.



**CAUTION:** The content of this section is NOT recommended for use by anyone besides GPD Global personnel or those working under the direct guidance of GPD Global personnel. Improper application of this information can lead to serious complications in FLOWare®Software operations. Any non-GPD Global employee who uses this information beyond the stated application specified by GPD Global Service Department personnel is in danger of causing personal injury and invalidating their machine warranty.

**REQUIRED:** blank USB flash drive