



# Firmware

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# General Information

## Terminology

**Firmware**

Describes the system software for the 64 bit and H8 range including the fonts.

**H8**

The *H8 processor* controls the print head, sensors and motors. The *H8 system* is a part of the firmware which is responsible for the H8 processor.

**64 bit**

The *64 bit processor* controls the internal and external data flows via the interfaces and manages the main memory. The *64 bit system* is the part of the firmware, which is responsible for the 64 bit processor

## Distribution of main memory

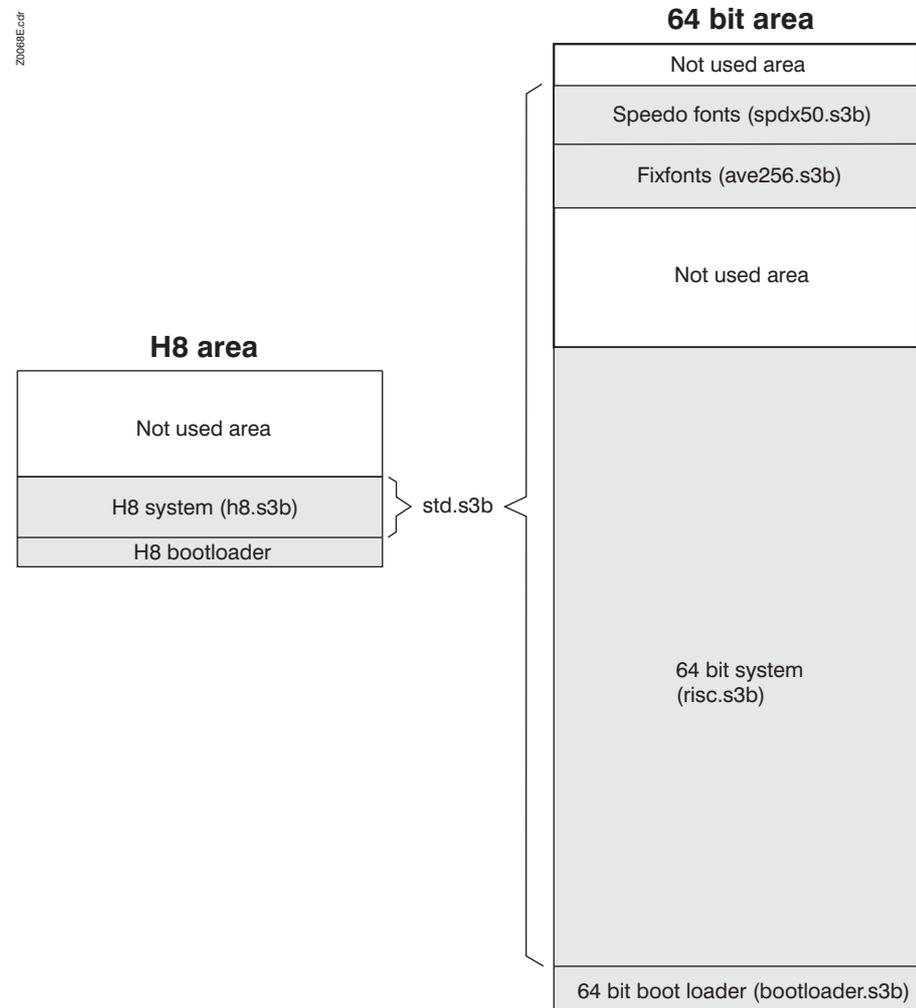
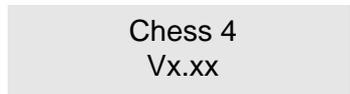


Fig. 1: Distribution of the areas of the main memory assigned to the H8 and 64 bit systems. The designations for the relevant system files are given in brackets.

### Firmware version

The printer shows the installed firmware version on the display for a few seconds after it has been switched on:

**Vx.xx**



*E.g. printer model Chess 4, firmware version x.xx*

The version numbers of the two subsystems H8 and 64 bit ([Fig. 1](#)) are given at the top of the “Printer Status” info printout. For example, the following details could be displayed under “System Version”:

[R2.25 H2.25]

R2.25 indicates the version number of the 64 bit system, H2.25 shows the version of the H8 system.

- Information on generating info printouts can be found in the topic section “Info-Printouts and Parameters”.

### Loading procedures

The following possibilities of firmware loading exist:

- Loading the *complete firmware*, that is both, 64 bit and H8 system
- Loading only the *H8 system*
- Loading only the *bootloader*



- ➡ Executing or applying the load procedure incorrectly can set the device into a critical condition, which can only be rectified by trained technicians. Loading parts of the firmware should therefore only be executed by experienced operators or service technicians.

The following load procedures are described in the next chapters:

Load what?	Run when?	Description in chapter
<i>Firmware</i> (normal case)	Existing firmware is to be updated to the newest version.	<a href="#">Loading the Firmware (Normal way)</a> on page 5
<i>Firmware</i> (forced bootloader start)	No valid or no firmware available (display: “Boot Loader Vx.x ...”) or the firmware is damaged (printer “hangs up” or displays incomprehensible messages)	<a href="#">Loading the Firmware (via bootloader)</a> on page 11
<i>H8 system</i>	Only the part of the firmware for the H8 processor is to be updated (e.g. if this is damaged: display: “Load H8 Program”).	<a href="#">Loading the H8 System</a> on page 16
Bootloader	Only the bootloader is to be updated.	<a href="#">Reloading the Bootloader</a> on page 15

Tab. 1: Summary of all the load procedures described here.

### Files

The following files are supplied with the firmware:

File	Description
std.s3b	Contains the complete firmware, including h8.s3b, risc.s3b and the fonts
system.bat	Batch file, runs the command “copy std.s3b lpt1 /b”. See section <a href="#">Loading the Firmware (Normal way)</a> on page 5.
h8.s3b	Part of the firmware responsible for the H8 system. See section <a href="#">Loading the H8 System</a> on page 16.
risc.s3b	Part of the firmware responsible for the 64 bit system. See section <a href="#">Loading the Firmware (via bootloader)</a> on page 13.
spdx50.s3b	Speedo fonts
ave256.s3b	Fix fonts
download.exe	Program for loading the firmware part risc.s3b using the COM 1 serial interface. See section <a href="#">Loading via serial data line</a> on page 12.

Tab. 2: Files supplied with the firmware.

## Messages, pointing out faulty firmware

Below, you find status messages (gray background), which point out problems with the installed firmware. The text beside the messages links you to the chapter, where the solution of the respective problem is described.

Boot Loader Vx.x  
115Kbaud/Centro.

*Firmware damaged or not available --> section [Loading the Firmware \(via bootloader\)](#) on page 11.*

Status : 6004  
Load H8 program

*H8 system damaged or not available --> section [Loading the H8 System](#) on page 16*

Old firmware

*This message appears after someone has tried to load a firmware version lower than 2.30 into a printer with a CPU board which is supplied with AMD Flash ROMs. This combination is not permissible. The printer firmware will not be overwritten.*

## Loading the Firmware (Normal way)

### Downloading Firmware from the Internet

First obtain the current firmware files. You can download them from the following Internet page:

#### Internet

[http://www.machines.averydennison.com/printersystems\\_gb.nsf/wview/L4L2?OpenDocument](http://www.machines.averydennison.com/printersystems_gb.nsf/wview/L4L2?OpenDocument)

To do this proceed the following steps:

1. Click on the internet address above or type it manually into your browser. The internet page of Avery Dennison Machine Systems opens.
2. Select the appropriate firmware from the firmware list and click on it (e.g. "64-04/64-05/64-06/64-08 Firmware").

Your browser then starts to download the file.

### Information on the loading procedure

There are two methods of downloading the firmware to the printer:

- Using a *parallel* or *serial interface*.  
Downloading via the parallel (Centronics) interface is considerably faster. To do so, copy the appropriate file in MS-DOS mode to the printer interface, as described in the following. Or - more comfortable - use the download assistant.
- See section [Loading firmware using the Assistant](#) on page 8.
- Or save time by using a *Compact Flash card* for downloading.
- See section [Loading from a Compact Flash card](#) on page 16.

### Settings required before loading (Windows 95)

- ▣ The firmware files can only be transferred in MS-DOS mode via data line.

#### MS-DOS mode

There are two possibilities of changing to MS-DOS mode:

- From Windows 95 using the key combination  
START > SHUT DOWN > RESTART COMPUTER IN MS-DOS MODE.
- Press the F8 key shortly after switching on the computer.  
If you use this method, the load procedure will function without having to make the settings described further below. "Starting Windows 95..." appears in the top left corner of the screen before Windows is started. Press the F8 key just in this moment and then select "6. Prompt only". The computer now starts in MS-DOS mode.
- ▣ Before starting MS-DOS mode from Windows 95, it is imperative that you check whether the following settings have been made, otherwise the firmware data cannot be loaded successfully:
  1. Go to START > SETTINGS > PRINTERS. Click on a locally installed printer

- with the right mouse button.
- 2. Click on PROPERTIES in the context menu. This opens a dialog box.
- 3. Click on the DETAILS register tab.
- 4. Click on the PORT SETTINGS icon. This opens a window (Fig. 2).

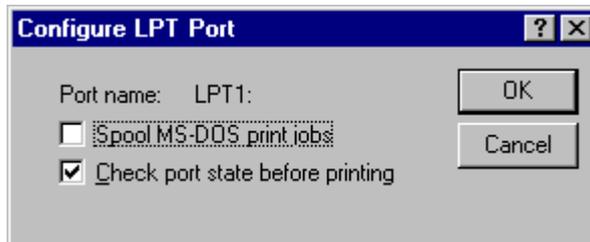


Fig. 2: **IMPORTANT!** Make sure that the first option box (“Spool MS-DOS print jobs”) is not activated.

- 5. Make sure that the “Spool MS-DOS print jobs” option box has not been selected. Click OK.

### Loading via Centronics

Proceed as follows to load the firmware from the PC to the printer:

- 1. Connect the printer and the PC using the Centronics interface.
- 2. Make sure that the Centronics interface has been activated (set the printer parameter *SCHNITTST.PARA* > *Interface* to Centronics).
- 3. Copy the file *std.s3b* to the printer as follows:

```
copy std.s3b lpt1 /b (printer connected to LPT 1).
```

The „system.bat“ batch file contains this copy command. This allows you to start the „system.bat“ file without manually entering it at the command line.

The following is now displayed:

```
Programmdownload      xxx: bytes loaded
Kbytes: xxx
```

with short interruptions by:

```
Programmdownload      xx: Address of the sector which is actually being deleted
Delete Sect : xx
```

- 4. If the download was successful, the printer now switches to offline mode:

```
OFFLINE  0 JOBS
```

➡ If you are using a TT4 printer, load the file „tt4.s3b“ instead of „std.s3b“ (not included on the documentation CD).

### Loading from a Compact Flash card

Proceed as follows to load the firmware from the PC to the printer:

1. Copy the file „std.s3b“ onto a Compact Flash card. To do this a PCMCIA adapter must be installed on your PC.
- Information on using Compact Flash cards can be found in the “Cards” manual.
2. Rename „std.s3b“ to „autostrt.for“ (either on the Compact Flash card or before the file is copied).
3. Switch the printer off.
4. Insert the Compact Flash card into the card slot on the printer.
5. Switch the printer on. The firmware is now loaded automatically. The following is displayed:

```

Programmdownload      xxx: kilobytes loaded
Kbytes: xxx

```

with short interruptions by:

```

Programmdownload      xx: Address of the sector which is actually being deleted
Delete Sect : xx

```

This message appears if the data was transferred correctly:

```

Switch off
Remove card

```

➡ If you are using a TT4 printer, load the file „tt4.s3b“ in place of „std.s3b“ (not included on the documentation CD).

## Loading firmware using the Assistant

The Download Assistant is a utility program for comfortable downloading of printer firmware from PCs, using a Windows operating system.

- Without the assistance of the utility program, the printer operating system must be switched to MS-DOS mode before starting to download.

### System requirements

#### PC

The program can only be used with a PC running under one of the following operating systems: Windows 95, Windows 98, Windows NT 4.0, Windows 2000 or Windows ME

The PC must be equipped with a serial or parallel interface.

#### Printer types

All types listed in the header line of this document.

### Installation

Start the setup program „SetupFirmwareDownload.exe“. The program can be found on the Documentation-CD, in folder „Utilities“.

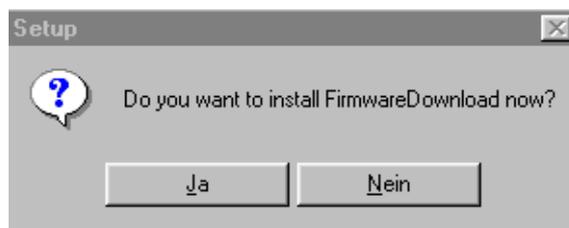


Fig. 3: First, you will be asked, if you want to install the program „FirmwareDownload“ now. Click „Ja“.

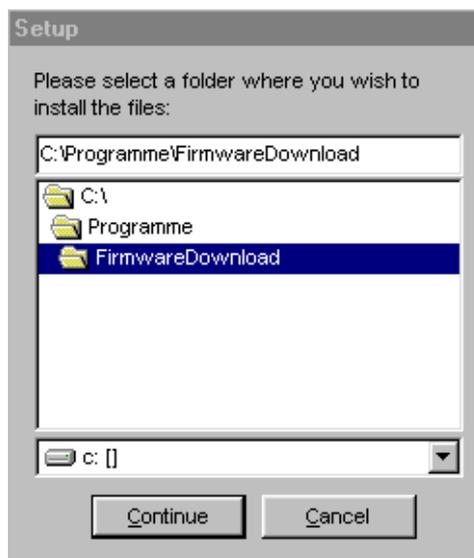


Fig. 4: A file selection window opens. Choose a directory, to which the program should be copied.

## Starting the program

1. The setup program places an icon on the Windows desktop (see Fig. 5). Click on the icon to start the program. The program window opens (see Fig. 6)



Fig. 5: Click on this icon to start the program.

2. Click on „Choose Dir“. A file selection window appears. Open the folder which contains the firmware files and click on the file „System.bat“. The so marked file appears in the left half of the program window (see Fig. 6).

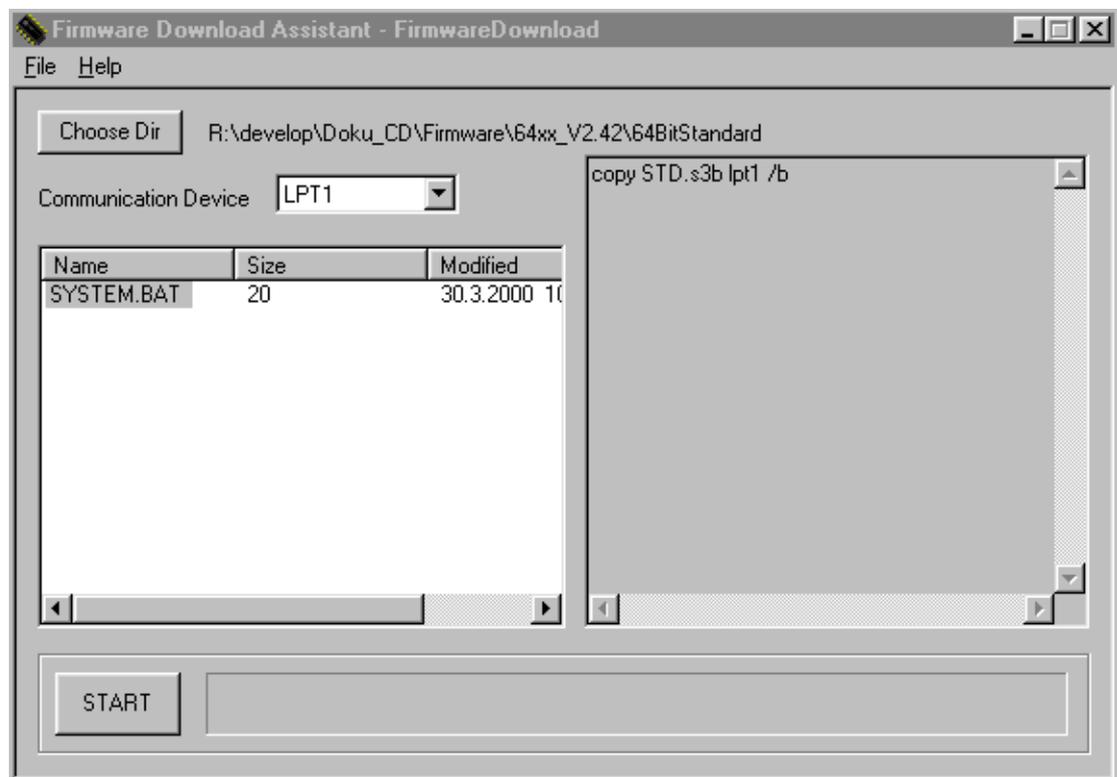


Fig. 6: Program window of „FirmwareDownload“ - here you can select the appropriate batch file and start the download process.

3. Open the list „Communication Device“ to select the interface which should be used for the download.
  - The appropriate interface must be selected at the printer (printer parameter *INTERF. PARAM.> Interface*)!
  - If a serial interface is ought to be used, open the menu „File> Settings> COM1“ or „File> Settings> COM2“ to set the transmission parameters. Those have to match the parameters set in the printer menu.

- Serial interface: Absolutely switch off the UART FIFO buffer. To do so, select the menu „File> Settings> COM1“ (or ...COM2) and click „Advanced...“. Thereupon, a window opens (see Fig. 7). Make sure, that „Use FIFO buffers“ is disabled.

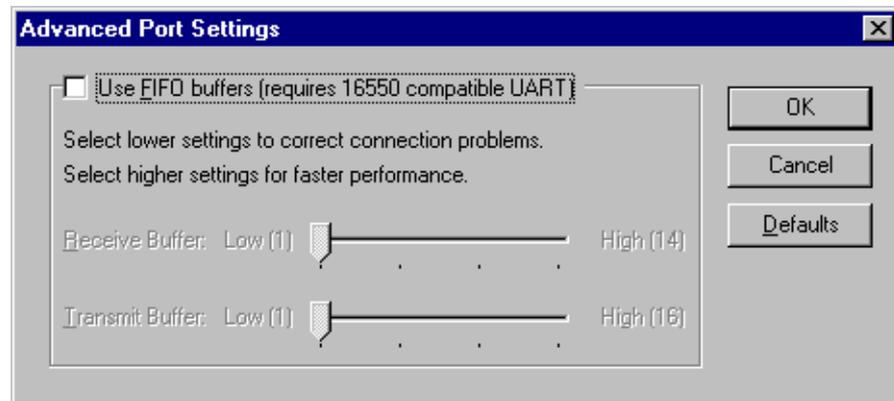


Fig. 7: Make sure to switch the FIFO buffer off before using a serial interface.

4. Click on the batch file in the left part of the program window (see Fig. 6). The command lines contained in the batch file now appear in the right part.
5. Click „Start“ to start the download process.

The following is now displayed:

```

Programmdownload      xxx: bytes loaded
Kbytes: xxx

```

with short interruptions by:

```

Programmdownload      xx: Address of the sector which is actually being deleted
Delete Sect : xx

```

6. If the download was successful, the printer now switches to offline mode:

```

OFFLINE    0 JOBS

```

## Loading the Firmware (via bootloader)

If the message below shows up on the printer display immediately after the printer has been switched on, no valid or no firmware is available. In this case the firmware must be reloaded using the bootloader.

```
Boot loader Vx.x
115Kbaud/Centro.
```

*Vx.x = bootloader version, e.g. V3.1*

This condition may be caused, for example, by switching off the printer while the firmware is being downloaded or due to a similar fault.

### Forced start

A forced start of the bootloader can be necessary, if valid firmware is available on the printer but is not functioning properly. To do so, press the Cut+Prog keys (Apply+Prog with DPM / ALX 924) for some seconds, while switching on the printer. The bootloader then indicates that it is ready by displaying the message shown above.

Proceed as described below, to load the firmware by aid of the bootloader:

### Loading via Centronics

1. Switch the printer off.
  2. Connect the printer and the PC using the Centronics interface.
  3. Switch the printer on.
- ➡ Press and hold down the Cut+Prog key when switching on the printer to trigger the bootloader forced start.

```
Boot loader Vx.x
115Kbaud/Centro.
```

4. Copy the file „risc.s3b“ to the printer:

```
copy risc.s3b lpt1 /b (the printer must be connected to LPT 1 at the PC).
```

The file „risc.s3b“ will now be loaded from the PC up to the printer.

```
Boot loader Vx.x
Kbytes: xxx
```

*xxx: bytes loaded*

The following status message is shown on the printer display when the download has been completed successfully:

```
Status no.: 6002
New prog. vers.
```

Acknowledge the message by pressing the Online button.

```
OFFLINE 0 JOBS
```

*If SYSTEM PARAMETER/ power-on mode = Offline*

Although the printer already shows that it is now running in Offline mode, the firmware part for the H8 processor must still be loaded to complete the download.

- Refer to section [Loading the H8 System](#) on page 16.

#### Loading via serial data line

1. Switch the printer off.
2. Connect the printer and the PC using a serial cable.
  - ▣ Only use the cable supplied with the printer.
3. Switch the printer on.
  - ▣ Press and hold down the Cut+Prog key when switching on the printer to trigger the bootloader forced start.

```
Boot loader Vx.x
115Kbaud/Centro.
```

*Vx.x = Version of the bootloader, e.g. V3.1*

4. Open the MS-DOS prompt window (under Windows). Open the folder into which you copied the firmware files.
5. To start loading the bootloader by typing in the program request  
`download risc.s3b`

The file „risc.s3b“ will now be loaded from the PC up to the printer.

```
Boot loader Vx.x
Kbytes: xxx
```

*xxx: bytes loaded*

The following status message is shown on the printer display when the download has been completed successfully:

```
Status no.: 6002
New prog. vers.
```

Acknowledge the message by pressing the Online button.

```
OFFLINE 0 JOBS
```

*If SYSTEM PARAMETER/ power-on mode = Offline*

- ▣ Although the printer already shows that it is now running in Offline mode, the firmware part for the H8 processor must still be loaded to complete the download.
- Refer to section [Loading the H8 System](#) on page 16.

## Reloading the Bootloader

Some exceptional cases require to update the bootloader. To do this, load the file flashloader.s3b (available on request from the manufacturer).

### Version test

To ascertain the version of the bootloader already installed proceed as follows:

### Cut+Prog

Switch the printer on while pressing the Cut+Prog keys.

The display shows the following:

```
Boot loader Vx.x
115Kbaud/Centro.
```

*Vx.x indicates the version number of the bootloader (e.g. V3.1).*

1. Connect the printer to the PC using a Centronics cable.
2. Switch the printer on.
3. Check that the Centronics interface is activated. (set the printer parameter INTERF.PARAM./Interface to Centronics)
4. Switch the printer to Online mode.
5. Open a DOS window (under Windows 95). Copy the file flashloader.s3b to the parallel interface (download time approx. 20 secs.):

```
copy flashloader.s3b lpt1 /b
```

- ➡ The load procedure is completed when the number of kilobytes (xxx) shown on the screen remains constant:

```
Programdownload
Kbytes: xxx
```

6. Switch the printer off.
7. Proceed as described in section [Version test](#) on page 15 to view the updated bootloader version.

## Loading the H8 System

Instead of loading the entire firmware, it is also possible just to load the H8 system. In this case it is also possible to load the firmware either via a PC interface (Centronics is recommended) or by using a Compact Flash card.

### Loading using the Centronics interface

Make sure that the Centronics interface has been activated (set the printer parameter *INTERF.PARAM.> Interface* to Centronics).

Load the H8 system as follows:

1. Connect the printer and the PC using the Centronics interface.
2. Switch the printer on. At the same time press the Cut+Feed+Prog keys for about five seconds. The display shows the following:

**Cut+Feed+Prog**

```
Status:      6004
Loading H8 program
```

3. Copy h8.s3b to the printer as follows:

`copy h8.s3b lpt1 /b` (the printer must be connected to LPT 1).

```
Programdownload   xxx: kilobytes loaded
Kbytes: xxx
```

If the download was successful, the printer now switches to offline mode:

```
OFFLINE   0 JOBS
```

### Loading from a Compact Flash card

Proceed as follows to start downloading the program from the Compact Flash card:

1. Copy the file h8.s3b onto a Compact Flash card. To do this a PCMCIA adapter must be installed on your PC.
- Information on using Compact Flash cards can be found in the “Cards” manual.
2. Rename h8.s3b to autostrt.for (either on the Compact Flash card or before the file is copied).
3. Switch the printer off.
4. Insert the Compact Flash card into the card slot on the printer.
5. Switch the printer on. The firmware is now loaded automatically.

```
Programdownload   (xxx: kilobytes loaded)
Kbytes: xxx
```

- ▣ At the end of the download procedure, you are not prompted to switch the printer off and to remove the card as is the case when loading the complete firmware. Instead, you must wait for the right moment before switching the printer off, otherwise the load procedure is restarted.

6. Switch the printer off as soon as the display shows the following:

Avery 64-04  
Vx.xx

*e.g. printer model Avery 64-04, x.xx = version number of the firmware*

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