ABB MEASUREMENT & ANALYTICS | 2107014MNAA

Software Package Integrity Check
How to Guide

1 Overview

This guide describes the process to verify the integrity of downloaded embedded ABB Totalflow software. ABB makes software packages available to support field upgrades and manufacturing processes. Software for field upgrades is available on the ABB global website.

To ensure the integrity of the downloaded software package, ABB provides an SHA512 hash file that is used to check that the software package has not been corrupted or tampered with during download from the ABB website or when shared across third-party systems. This document describes the use of Linux- or Windows-based verification utilities.

2 Software packages

The following package types are built for distribution to customers. Ensure the integrity of each package after download.

Table 2-1: Package types

Package type	Description	Use	Contents
Totalflow (Application or Flash) package	Totalflow package which contains applications including I/O, communication, operations etc.	This package is used at the ABB factory and in the field to update flash software on the device. Available to customers for download on the ABB library	Totalflow executable (Totalflow.exe) This package is also referred to as Flash package. The file name is unique to the product and reflects a part number, revision, and contents
OS package	Operating System package which contains the BSP for the device hardware along with an OS Abstraction Layer (OSAL) and a service to update the software.	This package is used at the ABB factory and in the field to update the OS on the device. Available for internal use only.	A signed binary image of the Operating System (osimage.fit)
Customer package	Customer package contains the Totalflow and OS packages into one package which is easy to carry and know which flash software goes with which OS.	This package is used in the field to update the flash and OS software on the device. Available to customers for download on the ABB library.	Totalflow.pkg OS.pkg The file name is unique to the product and reflects a part number, revision, and contents.
Super SD image	Bootable SD card image that formats the eMMC and installs the production bootloader and OS in the eMMC on the device.	This package is used only by the Contract Manufacturer (CM) to put the first software on the device. Available for internal use only.	Manufacturing bootloader Manufacturing OS Production bootloader Production OS

2.1 Software package part numbers

ABB Totalflow software packages have a base part number followed by 3 digits to indicate the build version of the package. For example, the number of the RMC-100 package containing both OS and Flash is 2105452. A package numbered 2105452-034 reflects build 34 of that package type. These part numbers uniquely identify each build release and identify the software on the download site.

2.2 Software package file names

The file names contained in software packages have additional identifiers to help identify the contents of the package. For example, a package can contain the OS and Totalflow application (OS + Flash customer package) or only the Totalflow application (Flash-only package). The file name has designators to help identify the contents.

The file names display when you download the package as described in section 4 Download software and files. You must first locate the package number on the product page.

Package names have the following form and extension:

<**Product**>-<**package contents**>-<**ABB Totalflow part number**>-<**revision**>.**pkg**

Where "package contents" indicates if the package has the OS, OS and Totalflow application (FL), or only the Totalflow application (FL). ABB makes the OS+Flash and the Flash-only packages available for download to support field upgrades.

For example:

- The part number 2105452-034 is assigned to the customer package file:

  RMC-OS-FL-2105452-034.pkg

  This file contains both the Operating System (OS) and the Totalflow application (Flash, FL)) for the RMC-100. The package contains the OS package with part number: 2106487-001, and the Flash package with part number: 2105457-031.

- The part number 2105457-031 is assigned to package file:

  RMC-FL-2105457-031.pkg

  This file contains only the Totalflow application (Flash, FL) for the RMC-100.

Determining what package to download depends on which software is updated. In recently released devices, upgrades typically require the full package (OS +FL). Mature or legacy products may require application (Flash) upgrade only. The release notes provide information on the updates for each product and may indicate if a revision requires the upgrade of both packages.

3 Hash files

For each of the package types in Table 2-1 above, a hash file is also generated.

3.1 Hash algorithm

The hash is computed using SHA512 hash algorithm as defined in the FIPS-180-2 standard.

3.2 Hash file name

The file containing the hash has an extension ".sha512" and is usually named the same as the software package.

For example, for a Totalflow or flash-only software package file:

- Totalflow package: <flash package file name>.pkg
- The hash file is: <flash package file name>.sha512

For example, for the RMC-100:

- Flash-only (Totalflow) package: RMC-FL-2105457-031.pkg
- The hash file is: RMC-FL-2105457-031.sha512

3.3 Hash file contents

The contents of the hash file look like:

5ceccfc48de233892611e9b3fe02ae80092500480b3937a759392c9213bd93a6c557b40d7694e2dd159906332204ad48da67a68a0e6ab2dbfeb14af48ede2d2c *<package file name>.pkg

The first part of the line is the hash and the second part (starting with *) is the name of the package file for which the hash is generated.

4 Download software and files

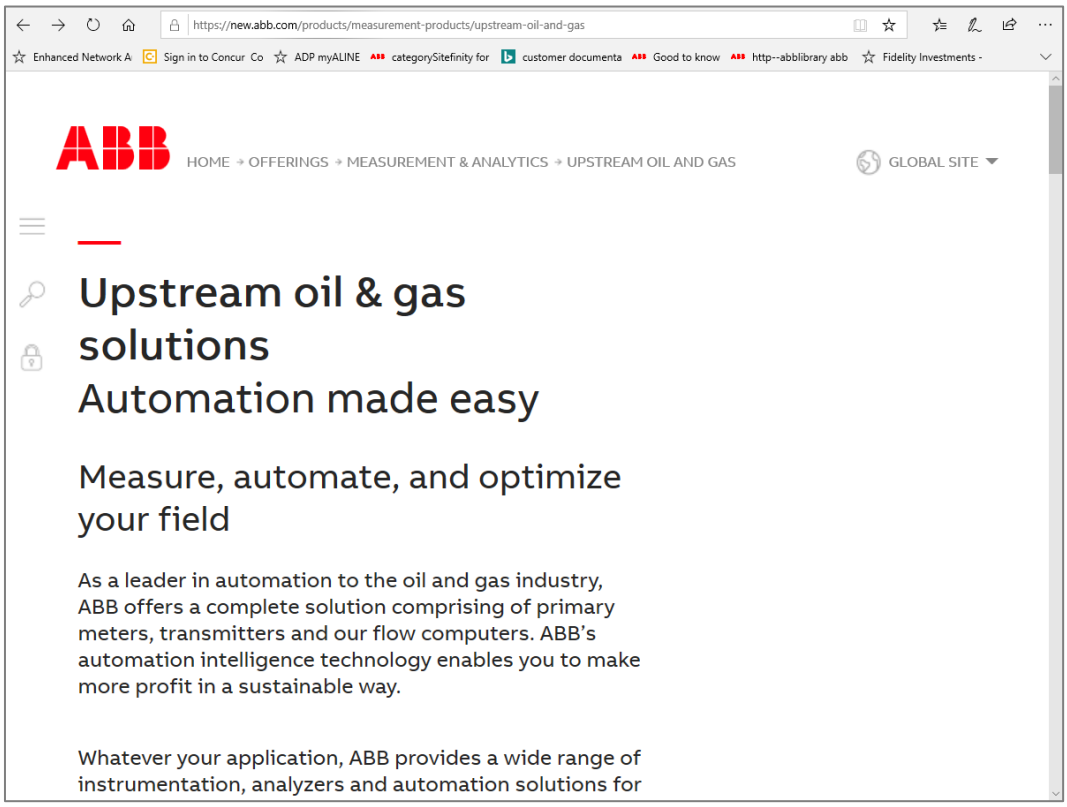
Before verification, download the software and verification files.

Package part numbers are different for each product type. Software packages and their verification files are available for download at www.abb.com/upstream, the ABB Totalflow home page.

To locate and download packages and files on the ABB website, select the product and the applicable package.

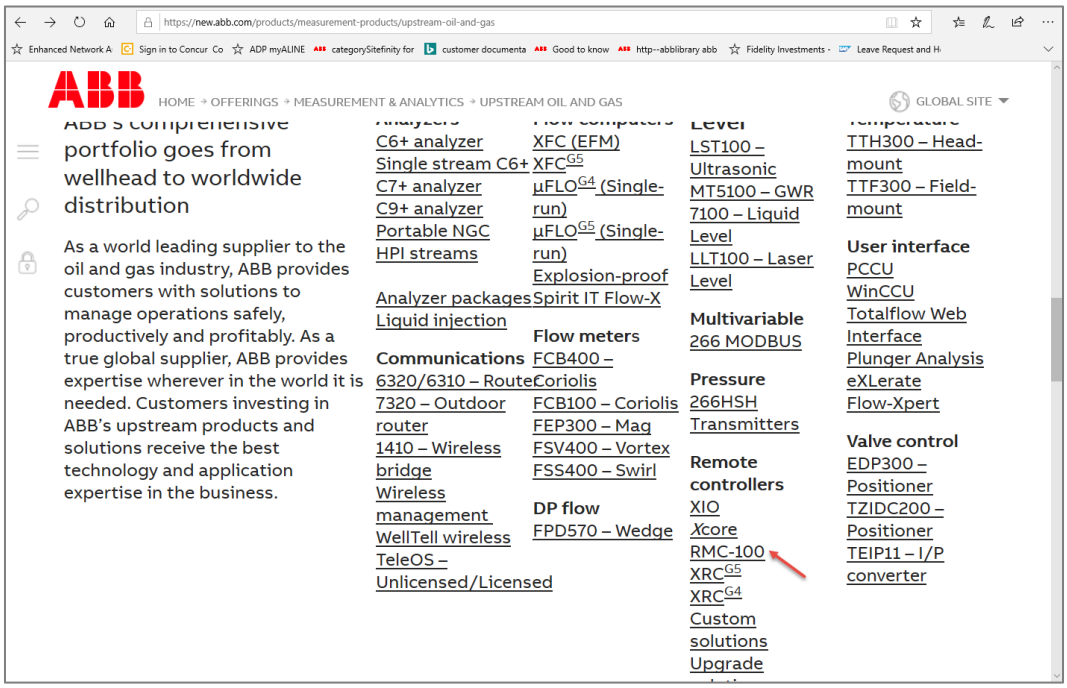
1. From a web browser, go to www.abb.com/upstream. The ABB Upstream oil and gas solutions page displays.

Figure 4-1: ABB Upstream oil and gas solutions main page



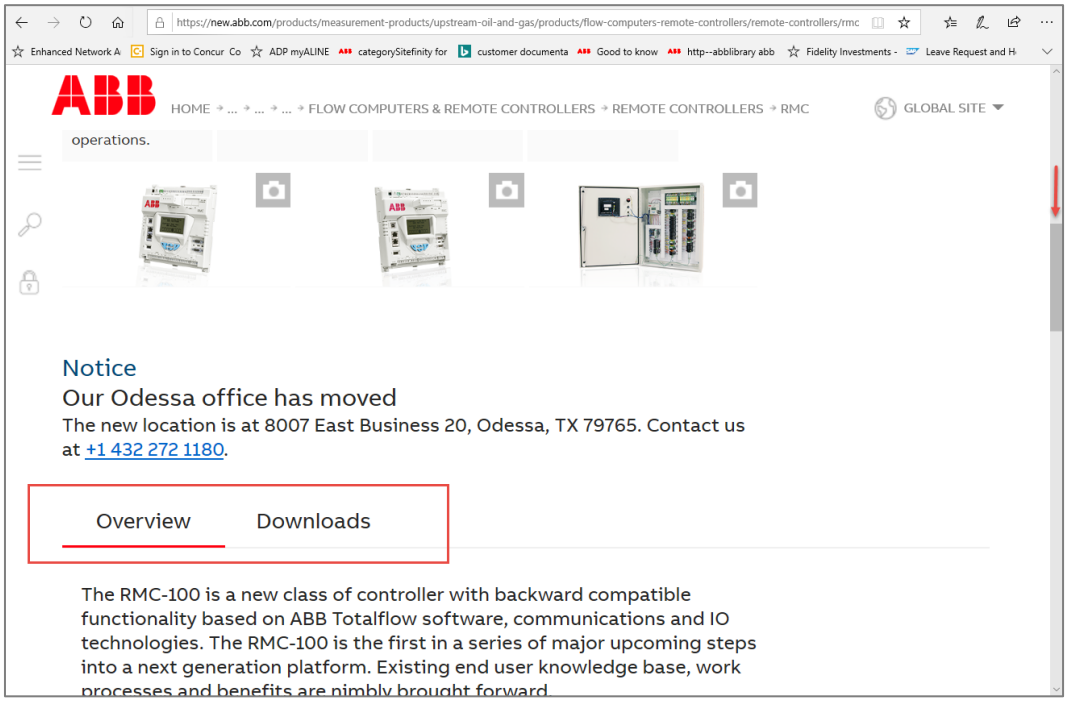
2. On the ABB main page, scroll down to locate the product.
3. Select the product to download software for. This example shows how to locate and download files for the RMC-100.

Figure 4-2: Select product to download software for



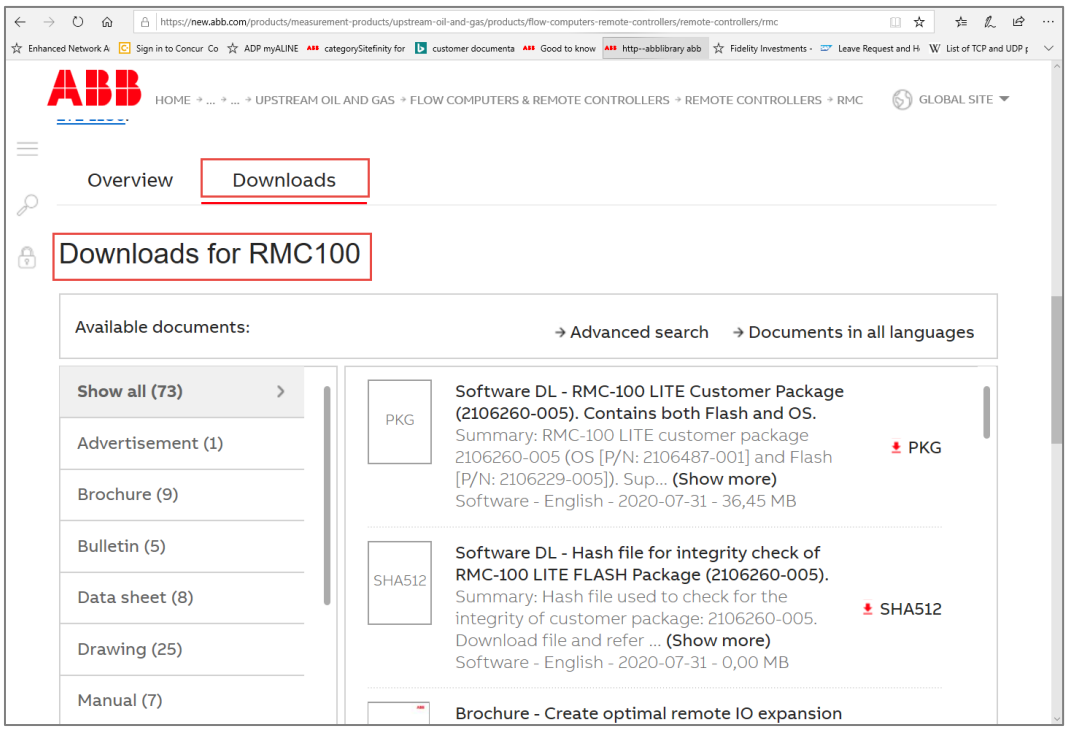
4. On the RMC-100 main page, scroll down to locate the overview section.

Figure 4-3: Product home page overview section



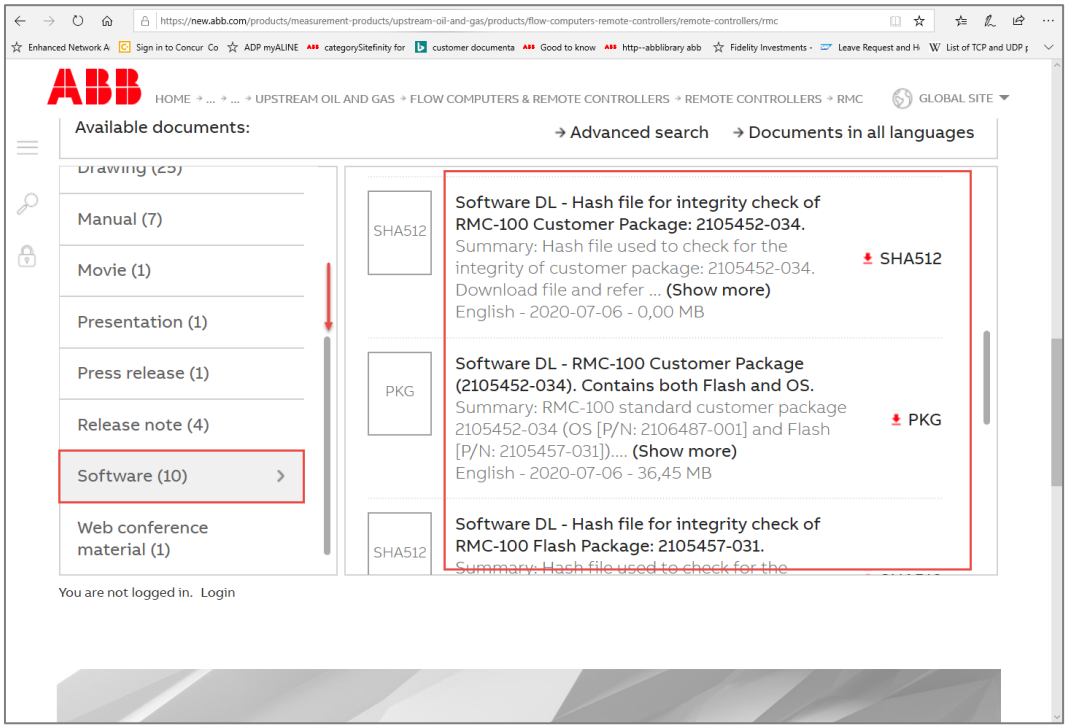
5. Select the **Downloads** tab. The downloads section displays with available documents and software specifically for the product.

Figure 4-4: Downloads for product



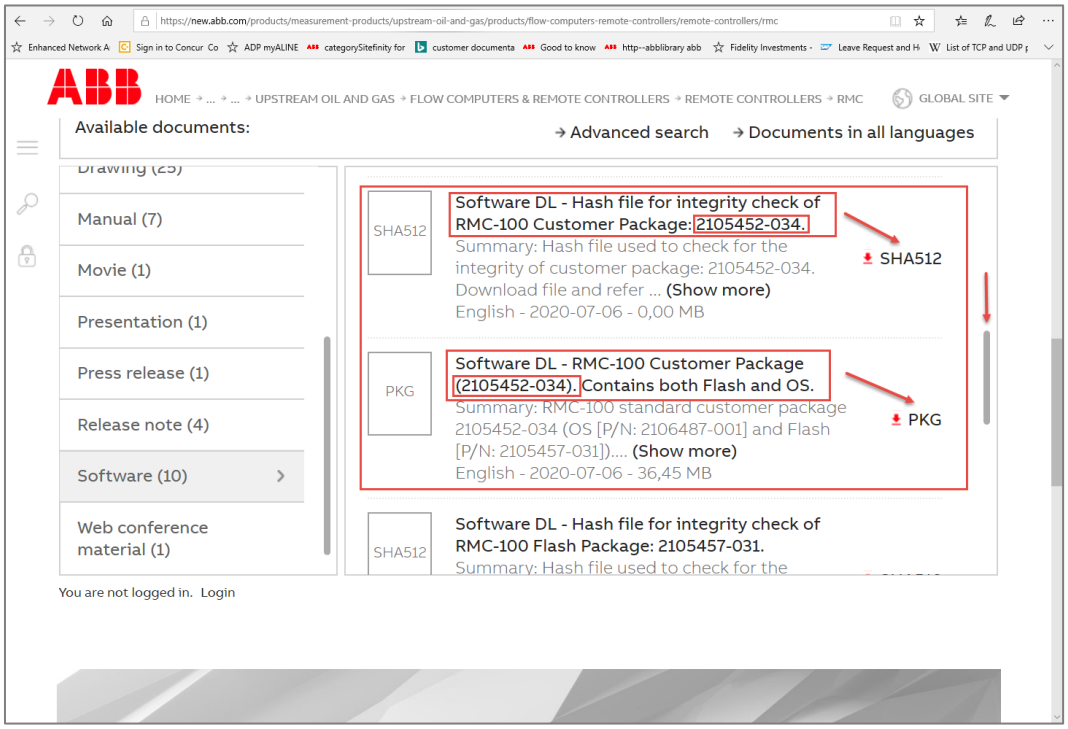
6. On the Downloads navigation tree, scroll down to locate and select the **Software** category. The list of available software for download displays.

Figure 4-5: Locate product download Software category



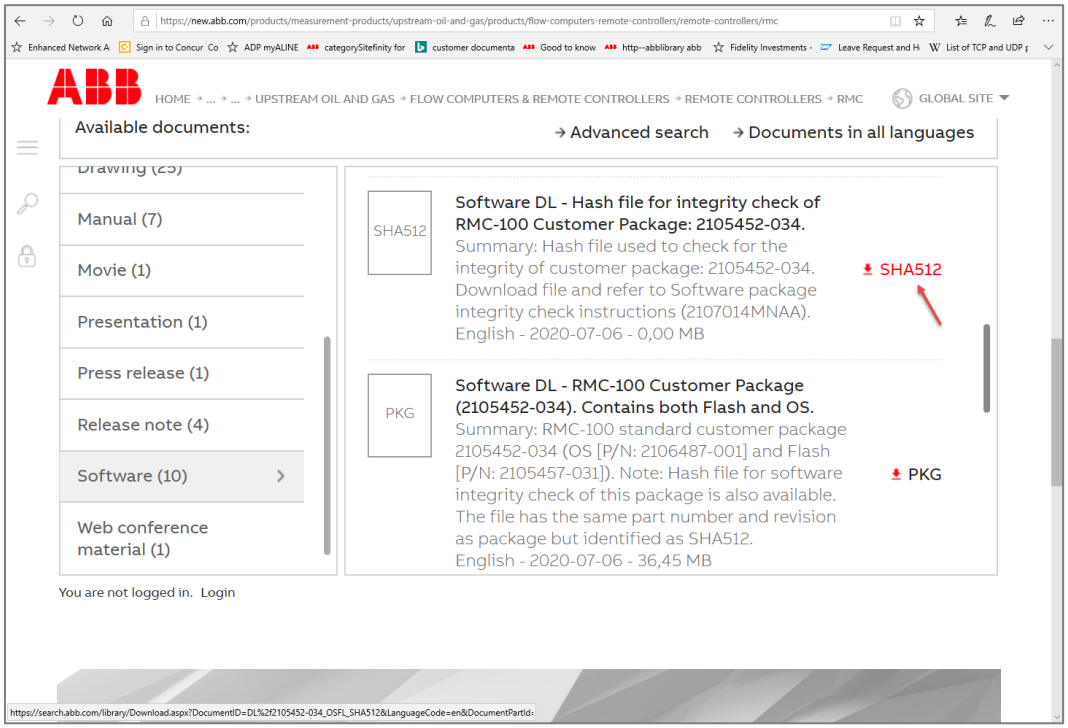
7. Scroll up or down the list of displayed items to locate the desired packages and verification files. In the example below, the RMC-100 customer software package 2105452-034 and its verification file are listed. Make sure to locate the verification file corresponding to the desired package. There may be several verification files for other packages in the list. The verification file item displays the package it is associated with.

Figure 4-6: Locate specific software build part number and revision for the product



8. Select the SHA512 icon to download the verification file.

Figure 4-7: Download the verification file

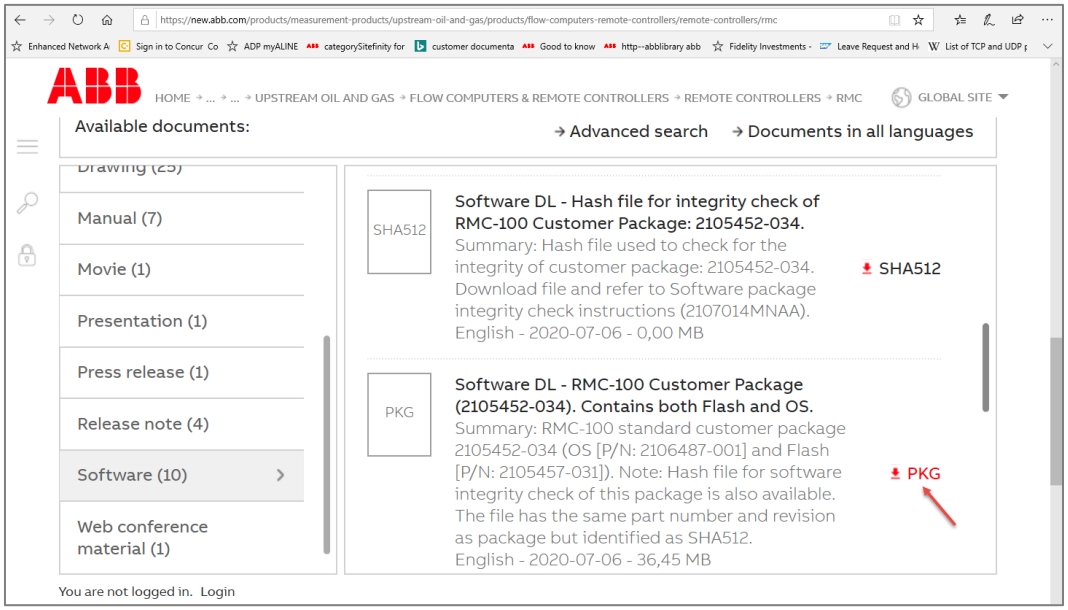


9. When the prompt to save the file displays (at the bottom of the browser screen), select **Save**, then **Save as**. Note that the name of the file displays. The file has the same name as the software package (product, type, part number and revision) but it has the .sha512 file extension.

Figure 4-8: Save the verification file

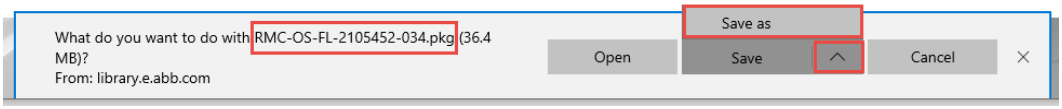
10. Save the file in the desired directory.
11. Select the software package file icon.

Figure 4-9: Download the software package



12. When the prompt to save the file displays (at the bottom of the browser screen), select **Save**, then **Save as**. Note that the full name of the package displays. The package name includes [product, type (OS and Flash), part number and revision] with the .pkg file extension.

Figure 4-10: Save the software package



13. Save the package in the desired directory.

5 Package verification

The integrity of the software package can be verified using the hash file provided along with it.

5.1 Prerequisites

A third-party tool is required to verify the integrity of the package. Two tools that can be used on different operating systems include:

- sha512sum: Command line utility available on Linux systems
- certutil: Command line utility available on Windows® systems

5.2 Verification procedure

5.2.1 Linux commands

Use the Linux command line utility sha512sum as follows:

1. Keep the software package (.pkg) and hash file (.sha512) in a folder (<PKG_DIR>).
2. Change the current directory to <PKG_DIR>.
3. Run the following command:
   \> sha512sum –b <package file name>.pkg

It will generate the hash for the pkg file using the SHA512 algorithm which will look like the following:

5ceccfc48de233892611e9b3fe02ae80092500480b3937a759392c9213bd93a6c557b40d7694e2dd159906332204ad48da67a68a0e6ab2dbfeb14af48ede2d2c *<package file name>.pkg

4. Compare this generated hash with the hash contained in the hash file (.sha512). If they are the same, then the package is successfully verified for its integrity.

5.2.2 Windows commands

Use the Windows built-in command line utility certutil as follows:

1. Keep the software package (.pkg) and hash file (.sha512) in a folder (<PKG_DIR>).
2. Change the current directory to <PKG_DIR>.
3. Run the following command:
   \> certutil –hashfile <package file name>.pkg SHA512

It will generate the hash for the pkg file using the SHA512 algorithm which will look like the following:

SHA512 hash of file <package file name>.pkg:
5ceccfc48de233892611e9b3fe02ae80092500480b3937a759392c9213bd93a6c557b40d7694e2dd159906332204ad48da67a68a0e6ab2dbfeb14af48ede2d2c
CertUtil: -hashfile command completed successfully

4. Compare this generated hash with the hash contained in the hash file (.sha512). If they are the same, then the package is successfully verified for its integrity.

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