Gallagher Controller 6000 vCR9.40.251031b

Release Note

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1 Introduction

The Gallagher Controller 6000 is a processing board for a security access system. It is built using the Linux Kernel 6.1.136.

All variants of the Controller 6000 can operate on their own, or can have an optional Gallagher Reader Module or Gallagher HBUS Module connected.

2 Reason for version

This version of Gallagher Controller 6000 code (vCR9.40.251031b) contains a number of enhancements for vEL9.40 of Gallagher Command Centre. For further information refer to the *Gallagher Version 9.40 Feature Summary* and the *Gallagher Controller 6000 and 7000 Hardening Guide* (both located in the 'Documentation' directory of the Command Centre installation files).

3 Compatibility

This version of Gallagher Controller code is compatible with the Gallagher Controller 6000, 7000 and 7000 Single Door.

3.1 Gallagher Command Centre compatibility

This version of Controller code can be used in conjunction with version vEL9.40 (or later) of Gallagher Command Centre.

3.2 Gallagher Controller API compatibility

Version vCR9.40 of the Gallagher Controller is compatible with version vEI8.10.11 of the Gallagher Controller API (FTCAPI). If your site has a pre- vEI8.10.11 version of FTCAPI installed, and you are upgrading your Controllers to vCR9.40, then the FTCAPI also needs to be upgraded.

Refer to "FTCAPI Release Note vEI8.10.11.pdf" (located in the 'Utilities\Controller API' directory of the Command Centre installation files), for further instructions.

3.3 Controller to Controller compatibility

A Controller 6000 that is running the latest firmware will not communicate with Controllers running firmware earlier than vGR7.10. To minimise disruption during upgrades where components are split over multiple Controllers, upgrade Controllers to vGR7.10 or later before upgrading to the latest firmware.

Note: Transient "Bad authentication" alarms may be seen when upgrading to v9.40. This is due to time delays configuration reaching Controllers, in order for them to accept connections from already configured Controllers. These alarms should stop occurring once the network configuration is up-to-date on all related Controllers.

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3.4 Component compatibility

The most recent code versions are as follows:

Gallagher Command Centre	-	vEL9.40
Gallagher Reader Plug-in Module	-	vPL5.00.001
Gallagher F31/32/41/42 Fence Controller	-	vHC5.00.003
Gallagher HBUS Module	-	vHP5.00.001
Gallagher HBUS Reader STM (small flash)	-	vHM4.50.017
Gallagher HBUS Reader STM	-	vHN5.00.037
Gallagher HBUS Reader Renesas	-	vHMA5.00.037
Gallagher HBUS Contact Card Reader	-	vHSC5.40.001
Gallagher HBUS Keypad Reader STM	-	vHK5.00.007
Gallagher HBUS Keypad Reader Renesas	-	vHKA5.00.007
Gallagher Z10 Tension Sensor	-	vTW5.00.002
Gallagher T20 Terminal	-	vHT5.70.040
Gallagher HBUS IO STM	-	vHI5.00.007
Gallagher HBUS IO Renesas	-	vHIA5.00.007
Gallagher Class 5 End-of-Line Module (ELM) VaultIC	-	vCF5.00.007
Gallagher Class 5 End-of-Line Module (ELM) Edgelock	-	vCFE5.00.007
Gallagher Reader Bluetooth® BGM111	-	vHBT1.00.010
Gallagher Reader Bluetooth® BGM220	-	vHBTA1.02.050

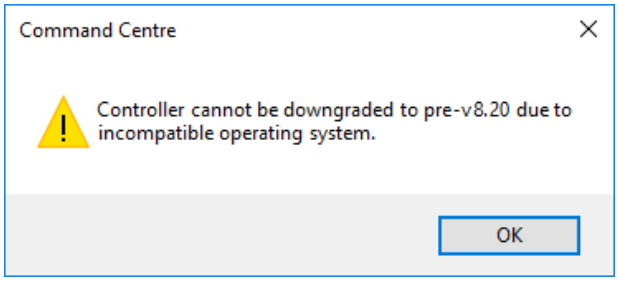
4 Upgrading the Gallagher Controller

Ensure you have upgraded Gallagher Command Centre before upgrading your Controller(s).

Sites upgrading with Controllers running v8.20 or later software, will already have migrated to a Linux OS so this will be a normal upgrade. However, sites upgrading Controller 6000s from a pre-v8.20 version to v9.40 will also upgrade the Controller OS (operating system) from WinCE to Linux. This will take longer than a normal upgrade.

IMPORTANT:

- Run the Gallagher Pre-upgrade Validation Tool to evaluate your site compatibility with the upgrade. For instructions refer to the *Gallagher PreUpgrade Validation Tool Release Note* (located in the 'Utilities\PreUpgradeValidationTool_v8.50.15' directory of the Command Centre installation files).
- Serial/Dial-up network connection is unsupported for all Controllers from vEL8.50 onwards. Ensure all Controllers communicate via a LAN before upgrading.
- There will be no option to opt out once the upgrade begins, and no way to downgrade to a pre-v8.20 WinCE version. A factory reset will return the Controller to the first Linux version. If you attempt to downgrade a Controller running Linux to WinCE the following message will display:



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Important Controller 6000 v9.40 upgrade note

When configuring a new Controller running…	then the…
any software version below v8.40 using BootP on vEL9.40 Command Centre,	Controller must have DIP Switch 2 ON until the Controller software version matches the Command Centre version. BootP is used where Controller and Command Centre Server is on same subnet.
any software version below v8.20 using DHCP on vEL9.40 Command Centre,	Controller must have DIP Switch 2 and 3 ON until the Controller software version matches the Command Centre version. If the Controller is already running Linux OS (v8.20 and beyond), then only DIP Switch 2 should be ON for DHCP.
software version v8.20 or above using DHCP on vEL9.40 Command Centre,	Controller must have DIP Switch 2 ON until the Controller software version matches the Command Centre version.
any software version using default IP web config,	basic information is cached which includes Controller IP, Server IP, subnet, and gateway. Therefore, DIP Switch 2 and 3 should be turned OFF as this information is retained which helps the Controller communicate to the server when Controller is connected to the server network.

- Controller 6000s running vGR8.10.179 onwards can be migrated directly to Linux which could take up to 4 minutes. Controllers with older than vGR8.10.179 software will go through a two-step upgrade which could take up to 7 minutes.
- If migrating from WinCE to 9.40 Linux, the Controller will have an additional restart once booting Linux and receiving configuration because it will not have an initial time zone configuration.
- It is recommended sites resync Controllers when they are first migrated to Linux. Refer to *Appendix A* of this release note to achieve this.

Rollback a partial upgrade for any reason:
Gallagher has extensively tested the Controller OS upgrade process, and field experience confirms the upgrade process is extremely successful. However, Gallagher Technical Account Managers can be engaged to help manage sites with exceptional rollback needs, (e.g. a controller mistakenly upgraded). Note this rollback process should only be attempted in exceptional circumstances and can on occasion result in a permanently disabled unit. Controller code rollback from Linux to WinCE is not covered under standard Gallagher warranty terms.

Notes:

- The T2x and T2x PIV will have a longer than normal expected upgrade time when the controller is upgraded from pre-v8.20 to v9.40, (i.e. upgrade time will be approximately 2 hours for T2x PIV and 30 minutes for all other T2x variants).

  For sites already on v8.20 or later, upgrade time will be approximately 12 minutes for T2x PIV and 6 minutes for all other T2x variants.

  All T2x variants will function normally during the upgrade but once the upgrade is complete they will reboot.

  Understanding the download process
  If you have more than three T2x's attached via HBUS to a Controller 6000 the following information is important to read to understand the total upgrade time as multiple files will be upgraded on the T2x's.

  The download is a round-robin process and downloads the first file to the first three terminals before downloading the first file to the next three terminals, once all terminals have the first file the download of the second file starts on the first three terminals and so on for the remaining files.

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Once the T2x receives all files it will reboot, the point here is the upgrade time will be increased for each terminal based on how many terminals are attached to the Controller.
Upgrade progress can be monitored on the **Connections** tab of the HBUS Terminal, HBUS Alarms Only Terminal or HBUS Contact Card Reader.

- Please make sure that the Gallagher Controller does not lose power during an upgrade as this may result in a Controller that no longer functions. In this scenario you would need to return the unit to the Field Service department.

  Go to the **Software** tab of the Controller Property Pages and assign the latest device software, (e.g. vCR9.40.251031b), and **Apply**.
  The upgrade should happen. You can monitor the upgrade via the progress bar on the **Software** tab and then a Controller version event in the Event Viewer reporting that the Controller is running the new version.
  Notes:
  - During a Controller upgrade it is normal for the Run LEDs to turn off intermittently, for approximately 5 seconds at a time.
  - If a Controller was running less than v7.80 before upgrading, the *"Controller using legacy encryption"* status message will appear until the Controller comes online running v9.40 firmware.
  - Following an upgrade, it is safe to remove power from a Controller once the Run LED is functioning normally, (i.e. 1 Hz flash mode).

4.1 Before you begin

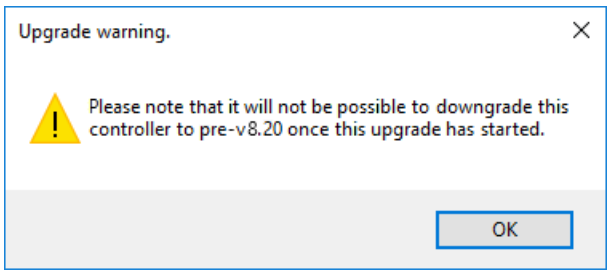
Before you begin an upgrade to vCR9.40, ensure you do the following:

- Turn DIP switch 3 OFF.
- Remove any customisations installed.
  IMPORTANT:
  - When a Linux customisation is assigned to a Controller running WinCE a message will display indicating that it requires Controller version v8.20 or later.
  - Sites with customisations that have not been upgraded to Linux prior to upgrade will not be able to use those customisations or reverse the upgrade process. It is recommended to have the v840 or later version of customisation before upgrading the Controller to v9.40 or later.
  - When a WinCE customisation is assigned to a Controller running Linux a message will display indicating that it requires an older Controller version.

4.2 Procedure

1. Do you want to upgrade the Controllers to vCR9.40 using a USB Flash Drive?
   If **no**, go to Step 2.
   If **yes**, go to ***4.3 Upgrading Controllers to vCR9.40 via USB Flash Drive***.

   Note: A Controller 6000 Bulk Change in Command Centre is another method of upgrading your Controllers. Warning messages similar to those shown below will display during a bulk change.
2. Upgrade to v9.40.
   Note: Because you are upgrading from WinCE to Linux, the following warning message displays. This message will not display for Linux to Linux upgrades.



3. Click **OK** to continue with the upgrade.

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4. Does another warning message display?

If…	then…
no,	the upgrade will complete.
yes,	a customisation DLL is detected as being installed. a) Click **Cancel** on the warning message. b) Remove the DLL and initiate the upgrade again. The upgrade will complete.

4.3 Upgrading Controllers to vCR9.40 via USB Flash Drive

1. In Command Centre, enable the **Perform upgrade via USB** option for an individual Controller 6000 (on the **Software** tab) or as the site default for all Controller 6000s (on the **Software** tab of the Server Properties).
2. Assign the 9.40 GGLSec Software package to the Controller.
   Refer to "Adding a new version of Device Software" in v9.40 of the *Gallagher Configuration Client online help file* for the procedure.
3. Click on the **Upgrade Now** button.
   A "USB Upgrade required" event is generated in Command Centre.
4. Add the 9.40 GGLSec file, (located in the 'Setup\Program Files\Gallagher\Command Centre\Device Software' directory of the Command Centre installation files), to a USB Flash Drive.
5. Insert the USB Flash Drive into the Controller, and wait for the Controller to go into slow flash and eventually 7 flash state.
   Once the Controller goes into 7 flash state, a "USB Upgrade complete" event is generated in Command Centre.
6. Remove the USB Flash Drive once 7 flash state occurs.
   The Controller will reboot.
7. If DIP switch 2 is on, perform a revalidate certificate override on the Controller.
   The Controller should come online with Software fully installed.

How to know if the download has failed
The Controller will return to a normal 1-flash state, and the following alarm will be generated in Command Centre:
"[Controller] - USB Upgrade Aborted".

If this happens, the USB Flash Drive that you are using is more than likely incompatible. You will need to use a different USB Flash Drive, formatted using FAT, and containing only the Controller 6000 GGLSec file.

5 DIP switch/Networking Changes from v8.20 and beyond (Linux OS)

- DIP switch 2 is used for BootP and DHCP configuration.
- DIP switch 3 is used only for Default IP configuration.
- From v8.90, the Controller will accept IP address offers from standard DHCP servers by default. You can use DIP switch 4 to disable the behaviour, which may be necessary if you want to use BootP to set up a Controller and there is a DHCP server on the network.
- The Firewall will always be enabled on Controller 6000s from vCR8.20 onwards.
- From v8.90, DIP switch 6 is no longer functional as controller always disables legacy communication.
- Router configuration is a must if Controllers are configured to use IPv6 after upgrading to v8.20 or above.
- If you are using pure IPv6 configuration, you need to perform a **Push Configuration** (via the Controller context menu in Command Centre) to get the Controller online.

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6 Useful information

- If a Controller running v7.80 or later firmware is restarted with DIP switch 2 turned on, it will cause "invalid certificate" alarms on the server until the "revalidate certificate" override is performed on that Controller. Similar, if a Controller is restarted with DIP switch 8 turned on, or is downgraded to a firmware version earlier than v7.80. This will also apply if a site has Controller DIP switch 2 ON during an upgrade.
- **Revalidate Certificate:** This tells the server to forget the previous stored identity of the Controller, and to re-challenge the Controller the next time it establishes a connection to the server. After performing the override, the Controller's status message will show *"Controller using legacy encryption"*, until the Controller reconnects. This status message will however stay if the Controller is running firmware earlier than v7.80.
- When sites are using Custom ListenPort and when bringing a new Controller online or DIP switch 2 restart your Controller in v9.40, they will be required to use "Send Server address" override to push the custom listen port config down to the Controller, as Controller by default will try to communicate to the server using port 1072 and it will remain offline.

  Note: A warning message *"Controller and all related items may be unusable for a period of time"* will display if you use the "Send Server address" override when the Controller's status message shows as *"Controller using legacy encryption" (*on the Controller's **Status and Overrides** property page).
- If you have upgraded Command Centre to 9.40 but your Controllers are still on an older version, applying configuration changes to a Controller will generate "Controller Incompatible configuration" events. This is because the change will not have been downloaded to the Controller.

  We recommend that sites do not make any configuration changes until the Controllers are on v9.40.

7 Recommendations

It is recommended that all components related to doors, (e.g. sensors, readers, etc.), are hosted by the same Gallagher Controller as the door. Splitting components over several Controllers is unsupported configuration.

If components are split over several Controllers then a network failure may result in incorrect door status, door open too long alarms, etc. Also, when one Controller restarts some parts of doors may report incorrect status.

Performance of access control will also be poor in this case.

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Appendix A: Upgrading Site / Controller Database Re-sync

Background

This appendix is intended to highlight when a Controller Database Re-sync is required. It is also intended to highlight the need for care and planning ahead when re-syncing controllers on large sites.

There are a number of reasons why you would perform a database re-sync, (e.g. a new controller has been installed, there have been cardholder database changes).

It is always required for you to read the release notes before upgrading a site as additional information may be posted on this process.

Planning and managing a Controller Database Re-Sync using Status and Overrides window

1. When any controller is brought online for the first time or after upgrading to v8.20 (or later), the cardholder database will be empty. As cardholders badge at a door the controller will query the server for the cardholder records, and the controller will then hold that record if indeed the cardholder is allowed through the door. If the controller was not able to contact the server it will deny access if it does not have the cardholder record.

   A Database Re-sync will need to be completed to avoid this situation where the controller cannot contact the server, and to populate the cardholder database. If the server later goes offline it will not matter.

2. On a large site it is recommended to re-sync one controller at a time.
   The reason for this is because on large sites a re-sync can make the server very busy, too many re-syncs at once can cause the server to be so busy it is not able to respond to controllers that are requiring access information for cardholders in a timely manner and this can result in unauthorised cardholder alarms and access denied at the door.

3. To monitor when a controller has finished the re-sync you can use the Controllers Status and Overrides window to report how many messages (updates) are pending for the controller.
   Note: It takes about a minute to destroy and recreate a blank card database on Controller 6000. During this time, no access attempts can be processed. Once the database has been created, access attempts perform normally, whilst the resync continues in the background.

4. When a Database Re-sync is requested the messages pending count will gradually increase until all cardholder information the controller needs to know about is queued up, this information will start flowing down to the controller. It is important to note the amount of messages pending does not directly represent the amount of cardholders being sent to the controller. Depending on the amount of messages pending the controller can take between a few minutes to over an hour to re-sync.

5. Do not perform a Database Re-sync on the same controller twice; within a short time, this will duplicate the amount of work at the server and controller.

If you require additional information or advice then please contact Gallagher Security Technical Support.

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Unix SMB/CIFS implementation.

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NOTE: If you use tdbs under valgrind, and in particular if you run tdbtorture, you may get spurious "uninitialized value" warnings. I * think this is because valgrind doesn't understand that the mmap'd area may be written to by other processes. Memory can, from the point of view of the grinded process, spontaneously become initialized.

I can think of a few solutions. [mbp 20030311]

1 - Write suppressions for Valgrind so that it doesn't complain about this. Probably the most reasonable but people need to remember to use them.

2 - Use IO not mmap when running under valgrind. Not so nice.

3 - Use the special valgrind macros to mark memory as valid at the right time. Probably too hard the process just doesn't know.

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44. [48]Rainer Pruy <Rainer.Pruy@informatik.uni-erlangen.de> monitoring/trap scripts, statistics file handling
45. [49]Dirce Richards <dirce@zk3.dec.com> Digital UNIX V4.0 port
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59. [63]Ulrich Windl <Ulrich.Windl@rz.uni-regensburg.de> corrected and validated HTML documents according to the HTML DTD

References

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@author Antoon Bosselaers <antoon.bosselaers@esat.kuleuven.ac.be>
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Zlib

ZLIB DATA COMPRESSION LIBRARYzlib 1.2.11 is a general purpose data compression library. All the code is thread safe. The data format used by the zlib library is described by RFCs (Request for Comments) 1950 to 1952 in the files http://tools.ietf.org/html/rfc1950 (zlib format), rfc1951 (deflate format) and rfc1952 (gzip format).

All functions of the compression library are documented in the file zlib.h (volunteer to write man pages welcome, contact zlib@gzip.org). A usage example of the library is given in the file test/example.c which also tests that the library is working correctly. Another example is given in the file test/minigzip.c. The compression library itself is composed of all source files in the root directory.

To compile all files and run the test program, follow the instructions given at the top of Makefile.in. In short "./configure; make test", and if that goes well, "make install" should work for most flavors of Unix. For Windows, use one of the special makefiles in win32/ or contrib/vstudio/ . For VMS, use make_vms.com.

Questions about zlib should be sent to <zlib@gzip.org>, or to Gilles Vollant <info@winimage.com> for the Windows DLL version. The zlib home page is http://zlib.net/ . Before reporting a problem, please check this site to verify that you have the latest version of zlib; otherwise get the latest version and check whether the problem still exists or not.

PLEASE read the zlib FAQ http://zlib.net/zlib_faq.html before asking for help.

Mark Nelson <markn@ieee.org> wrote an article about zlib for the Jan. 1997

issue of Dr. Dobb's Journal; a copy of the article is available at http://marknelson.us/1997/01/01/zlib-engine/ .

The changes made in version 1.2.11 are documented in the file ChangeLog.

Unsupported third party contributions are provided in directory contrib/ .

zlib is available in Java using the java.util.zip package, documented at
http://java.sun.com/developer/technicalArticles/Programming/compression/ .

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A Perl interface to zlib written by Paul Marquess <pmqs@cpan.org> is available at CPAN (Comprehensive Perl Archive Network) sites, including
http://search.cpan.org/~pmqs/IO-Compress-Zlib/ .

A Python interface to zlib written by A.M. Kuchling <amk@amk.ca> is available in Python 1.5 and later versions, see
http://docs.python.org/library/zlib.html .

zlib is built into tcl: http://wiki.tcl.tk/4610 .

An experimental package to read and write files in .zip format, written on top of zlib by Gilles Vollant <info@winimage.com>, is available in the contrib/minizip directory of zlib.

Notes for some targets:

- For Windows DLL versions, please see win32/DLL_FAQ.txt

- For 64-bit Irix, deflate.c must be compiled without any optimization. With -O, one libpng test fails. The test works in 32 bit mode (with the -n32 compiler flag). The compiler bug has been reported to SGI.

- zlib doesn't work with gcc 2.6.3 on a DEC 3000/300LX under OSF/1 2.1 it works when compiled with cc.

- On Digital Unix 4.0D (formely OSF/1) on AlphaServer, the cc option -std1 is necessary to get gzprintf working correctly. This is done by configure.

- zlib doesn't work on HP-UX 9.05 with some versions of /bin/cc. It works with other compilers. Use "make test" to check your compiler.

- gzdopen is not supported on RISCOS or BEOS.

- For PalmOs, see http://palmzlib.sourceforge.net/

Acknowledgments:
The deflate format used by zlib was defined by Phil Katz. The deflate and zlib specifications were written by L. Peter Deutsch. Thanks to all the people who reported problems and suggested various improvements in zlib; they are too numerous to cite here.

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