WOODWARD

Application Note 51244
(Revision NEW, 10/2004)
Original Instructions

EGCP-2 Software Upgrade Instructions

Field Conversion of EGCP-2 Controls:
8406-120/A/B/C/D to 8406-120E
8406-121/A/B/C/D/E to 8406-121F

General Precautions

Read this entire manual and all other publications pertaining to the work to be performed before installing, operating, or servicing this equipment.

Practice all plant and safety instructions and precautions.

Failure to follow instructions can cause personal injury and/or property damage.

Revisions

This publication may have been revised or updated since this copy was produced. To verify that you have the latest revision, check manual *26311* , *Revision Status & Distribution Restrictions of Woodward Technical Publications*, on the *publications page* of the Woodward website:

www.woodward.com/publications

The latest version of most publications is available on the *publications page*. If your publication is not there, please contact your customer service representative to get the latest copy.

Proper Use

Any unauthorized modifications to or use of this equipment outside its specified mechanical, electrical, or other operating limits may cause personal injury and/or property damage, including damage to the equipment. Any such unauthorized modifications: (i) constitute "misuse" and/or "negligence" within the meaning of the product warranty thereby excluding warranty coverage for any resulting damage, and (ii) invalidate product certifications or listings.

Translated Publications

If the cover of this publication states "Translation of the Original Instructions" please note:

The original source of this publication may have been updated since this translation was made. Be sure to check manual *26311* , *Revision Status & Distribution Restrictions of Woodward Technical Publications*, to verify whether this translation is up to date. Out-of-date translations are marked with ⚠. Always compare with the original for technical specifications and for proper and safe installation and operation procedures.

Revisions—Changes in this publication since the last revision are indicated by a black line alongside the text.

Application Note 51244

Warnings and Notices

Important Definitions

This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

- **DANGER**—Indicates a hazardous situation which, if not avoided, will result in death or serious injury.
- **WARNING**—Indicates a hazardous situation which, if not avoided, could result in death or serious injury.
- **CAUTION**—Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.
- **NOTICE**—Indicates a hazard that could result in property damage only (including damage to the control).
- **IMPORTANT**—Designates an operating tip or maintenance suggestion.

⚠WARNING

Overspeed / Overtemperature / Overpressure

The engine, turbine, or other type of prime mover should be equipped with an overspeed shutdown device to protect against runaway or damage to the prime mover with possible personal injury, loss of life, or property damage.

The overspeed shutdown device must be totally independent of the prime mover control system. An overtemperature or overpressure shutdown device may also be needed for safety, as appropriate.

⚠WARNING

Personal Protective Equipment

The products described in this publication may present risks that could lead to personal injury, loss of life, or property damage. Always wear the appropriate personal protective equipment (PPE) for the job at hand. Equipment that should be considered includes but is not limited to:

- **Eye Protection**
- **Hearing Protection**
- **Hard Hat**
- **Gloves**
- **Safety Boots**
- **Respirator**

Always read the proper Material Safety Data Sheet (MSDS) for any working fluid(s) and comply with recommended safety equipment.

⚠WARNING

Start-up

Be prepared to make an emergency shutdown when starting the engine, turbine, or other type of prime mover, to protect against runaway or overspeed with possible personal injury, loss of life, or property damage.

⚠WARNING

Automotive Applications

On- and off-highway Mobile Applications: Unless Woodward's control functions as the supervisory control, customer should install a system totally independent of the prime mover control system that monitors for supervisory control of engine (and takes appropriate action if supervisory control is lost) to protect against loss of engine control with possible personal injury, loss of life, or property damage.

NOTICE

Battery Charging Device

To prevent damage to a control system that uses an alternator or battery-charging device, make sure the charging device is turned off before disconnecting the battery from the system.

Electrostatic Discharge Awareness

NOTICE

Electrostatic Precautions

Electronic controls contain static-sensitive parts. Observe the following precautions to prevent damage to these parts:

- **Discharge body static before handling the control (with power to the control turned off, contact a grounded surface and maintain contact while handling the control).**
- **Avoid all plastic, vinyl, and Styrofoam (except antistatic versions) around printed circuit boards.**
- **Do not touch the components or conductors on a printed circuit board with your hands or with conductive devices.**

To prevent damage to electronic components caused by improper handling, read and observe the precautions in Woodward manual *82715*, *Guide for Handling and Protection of Electronic Controls, Printed Circuit Boards, and Modules*.

Follow these precautions when working with or near the control.

1. Avoid the build-up of static electricity on your body by not wearing clothing made of synthetic materials. Wear cotton or cotton-blend materials as much as possible because these do not store static electric charges as much as synthetics.
2. Do not remove the printed circuit board (PCB) from the control cabinet unless absolutely necessary. If you must remove the PCB from the control cabinet, follow these precautions:
   - Do not touch any part of the PCB except the edges.
   - Do not touch the electrical conductors, the connectors, or the components with conductive devices or with your hands.
   - When replacing a PCB, keep the new PCB in the plastic antistatic protective bag it comes in until you are ready to install it. Immediately after removing the old PCB from the control cabinet, place it in the antistatic protective bag.

EGCP-2 Software Upgrade Instructions
Download the latest software for 8406-120/-121

Introduction

Woodward is releasing application software **149E_app.hex** for upgrading existing EGCP-2 controls in the field. This application note explains how to download the software and describes all the changes made in the software.

The software can be used to upgrade only these existing controls.

- 8406-120 A, B, C, or D can be upgraded to 8406-120 E (this converts software 5418-149 A, B, C, or D to 5418-149 E).
- 8406-121 A, B, C, D or E can be upgraded to 8406-121 F (this converts software 5418-149 A, B, C, or D to 5418-149 E).

IMPORTANT **Woodward recommends that all existing stock be upgraded. This is only an application software upgrade, 149E_app.hex, and will not affect any of your configuration or calibration settings. The download takes approximately 14 minutes.**

A communication cable, Woodward part number 5417-551, can be used to download the new software.

New EGCP-2 Part Numbers	Description	Installation & Operation Manual	Application Manual	Communication Manual	Security Levels Manual
8406-120	150–300 Vac PT	26174	26175	26181	26108
8406-121	50–150 Vac PT	26174	26175	26181	26108

Description of Software Changes

1. **Start_All command**
   a. The Start_All command from the Master unit was being set for False if the Master unit received an Alarm or Shutdown when transferring back to the Utility. Even after the alarm was cleared the Start_All command remained in a False state. This would result in the Master unit not issuing a Start_All command on the next Loss of Mains event. In a multiple generator standby application this would cause only the Master to start, no Slave units would start.
   b. The Start_All command is now reset when the alarm is cleared.

2. **Slave units issuing a Generator breaker open command**
   a. When multiple units are connected onto a Load Bus by using the Auto and Run w/Load discrete inputs and then a Mains PT signal is received, the Slave units will issue an Open Gen Breaker command and then re-synch back on. The Master unit will be in the Close Mains Breaker mode.
   Only happens if:
      - Auto Sequence mode is configured for “Disabled”.
      - Mains PT signal is unstable when Auto and Run are closed.
      - The control is not configured to sense a Loss of Mains event.

   b. The Slave units will now stay in the In Synch mode when the Mains become stable.

3. Close Mains Breaker

a. A Close Mains Breaker command could be received even when the Mains became unstable.
b. Added a Mains Stable check in the synchronizer loop so that if the Mains became unstable the synchronizer will stop attempting to Close the Mains Breaker.

4. Open Gen Breaker

a. When synchronizing to close the Gen or Mains breakers, if the breaker would close on the last Close Attempt (configured in the Synchronizer menu) a very large percentage of the time it would issue an Open Breaker command.
b. This was a timing issue in the Aux feedback circuit. Corrected the Aux feedback timing issue in the EGCP-2.

5. Droop Mode

a. When configured for KW Droop, in the Real Load Control menu, the Speed and Voltage bias signals would both return to their Rated positions when the Generator Breaker Aux feedback was received.
b. Corrected so that the Speed and Voltage Bias signals would stay at their present positions when the Gen Breaker Aux is received.

6. Voltage Reference setting

a. The Voltage Reference, in Config menu, if set over 20,000 would cause a Sanity Check error. The –2 would show this as a Configuration Error alarm.
b. The Voltage Reference can now be set as high as 30,000.

7. Loss of Mains Action Delay Time

a. The LOMs Action Delay time had a Maximum setting of 30 seconds.
b. The Maximum now is 999 seconds.

8. Process Slave to Baseload

For Multiple unit application only. When multiple generators sets are operating against a Utility in the Process mode it is now possible to place a Slave unit into the Baseload mode without removing the 485 networks.

To place into Baseload

1. Close the Run w/Load input on the Slave unit.
   The EGCP-2 will now have the Auto and Run w/load inputs closed. It will still operate as a Process Slave unit, but will not be available for sequencing.
2. Open the AUTO input.
3. Control will ramp to the Baseload reference setting in the Real Load Control menu.
4. The Baseload Reference cannot be changed until it reaches the initial Baseload reference setting.
5. The Baseload reference can be changed thru the Speed Raise and Lower discrete inputs or over Modbus® * using Analog Write address 40003.
6. To ramp back into a Process slave mode just close the Auto input.

*—Modbus is a trademark of Modicon, Inc.

9. Idle Time

a. The Maximum Idle Time has been increased from 240 seconds (4 minutes) to 2400 seconds (40 minutes).

Compatibility with Existing Controls

The new software, 5418-149 E, will operate with all existing EGCP-2 and EGCP-1 controls.

Download Instructions

This section provides instructions for downloading the 149E_app.hex software needed to upgrade the 8406-120 or -121 controls. The software in the control after the download will now be 5418-149 Rev E.

IMPORTANT **Loading the application software will not affect any Configuration or Calibration set points.**

⚠WARNING **An unsafe condition could occur with improper use of these software tools. Only trained personnel should have access to these tools.**

Downloading the 149E_app.hex Software

Requirements

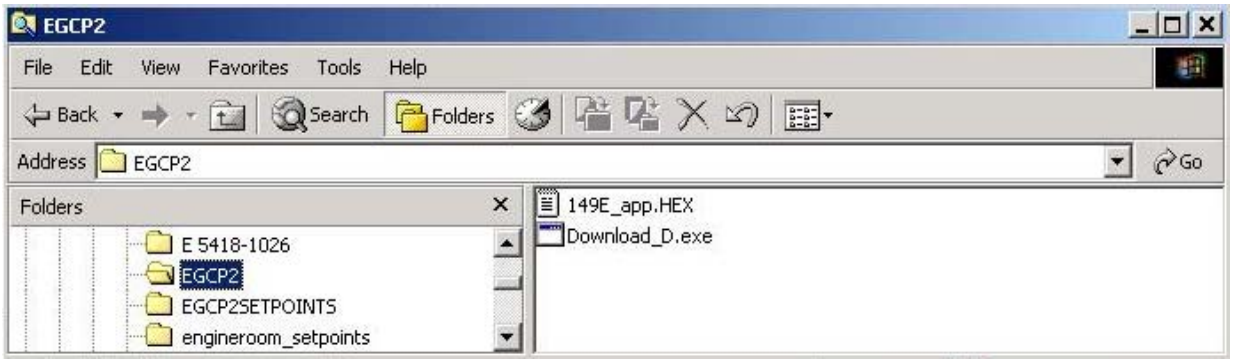
- EGCP Download Cable, Woodward part number 5417-551 (includes RS-232—RS-422 converter) or equivalent.
- Download_d.exe, part number 9926-113 Rev B or greater (download_d is a DOS-based freeware program that can upload and download configuration files through the RS-422 serial port on the EGCP-2. This program is available on the Woodward website at **www.woodward.com/software**).

Select EGCP-2 Tools and then select EGCP Download Program.

Instructions

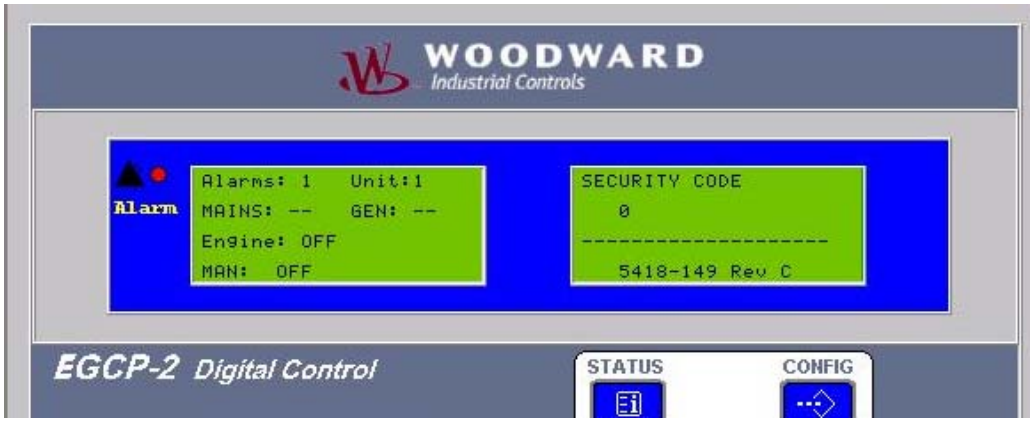
Save the download_d.exe file to the computer. In the following example, this file is saved in a directory called EGCP2 on the C:\ drive. Store the EGCP-2 software files in the same location.

Software—**149E_app.hex**

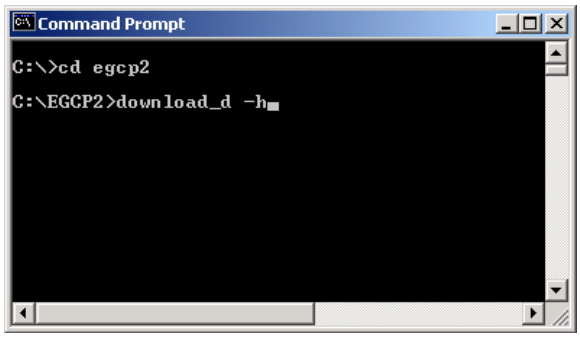


The EGCP-2 control that is being upgraded will have software 5418-149 already loaded. To view the software number that is programmed in the EGCP-2 control, press the “CONFIG” key and then press the “ENTER” key.

The software can be Rev A, B, C, D, or E. Here’s an example of a control installed with 5418-149 Rev C software.



Using a DOS command prompt, go to the directory where the download_d.exe file is stored and type "**download_d –h**" (or –?) for a complete list of the command-line options (see below).



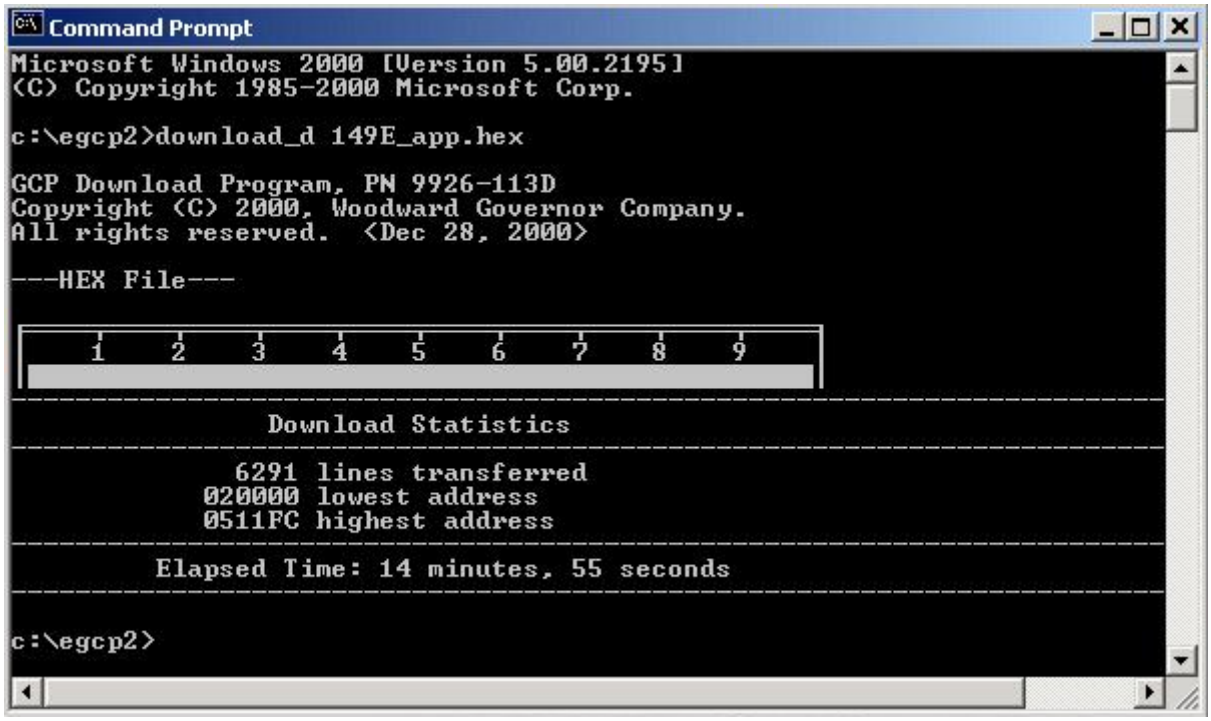
Establishing a Connection
Connect the RS-232 / RS-422 cable between the EGCP-2 and the computer.

IMPORTANT

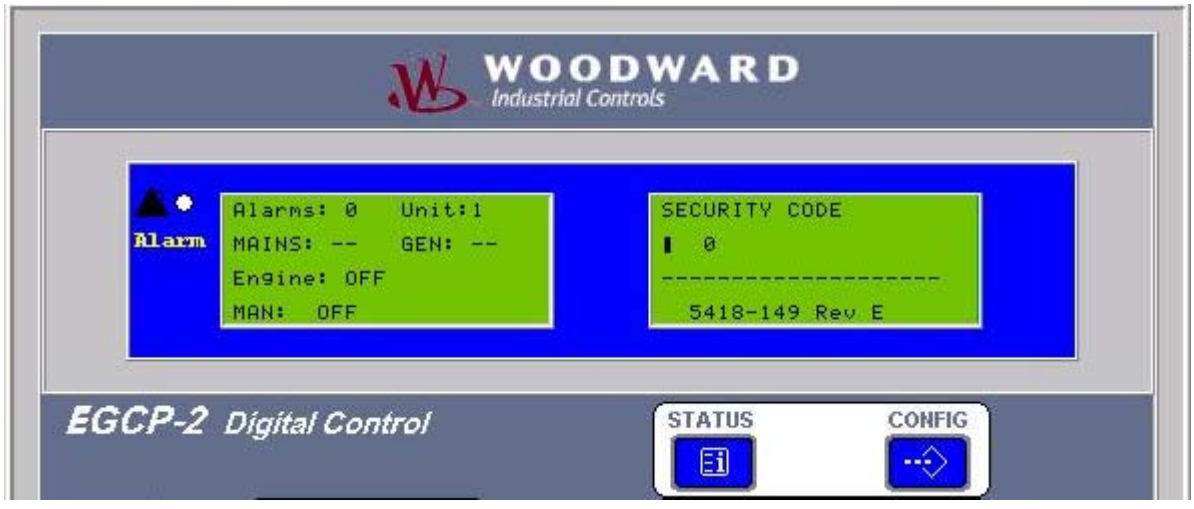
Only one EGCP-2 can be connected to the RS-422 communication network when uploading or downloading set points. If a multidrop network has been set up (linking more than one EGCP-2 on the RS-422 communication port network), it will be necessary to separate the control from the network in order to upload or download.

Downloading 149E_app.hex file from the Computer to the Control:
Using a DOS command prompt, go to the directory where the download_d.exe file is stored and type "**download_d 149E_app.hex**" at the DOS command prompt (see below). When the message appears as in the example below complete steps 1–6.

1. **Cycle power to the EGCP-2.**
2. When the power is restored to the control, the download will begin.
3. On the EGCP-2s left screen, the text "**APPLICATION**" will be displayed.
4. A scroll bar will appear on the computer screen showing the progress of the download.



5. After the download is complete, the control is ready to operate. **The set points and calibration adjustments have not been changed.**
6. The EGCP-2 will display software part number, 5418-149 Rev E.



We appreciate your comments about the content of our publications.

Send comments to: icinfo@woodward.com

Please reference publication 51244.

WOODWARD

PO Box 1519, Fort Collins CO 80522-1519, USA
1000 East Drake Road, Fort Collins CO 80525, USA
Phone +1 (970) 482-5811 • Fax +1 (970) 498-3058

Email and Website—www.woodward.com

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