IMPORTANT PRODUCT INFORMATION

READ THIS INFORMATION FIRST

Product: **Max-ON™ Hot-Backup Redundancy Software, Release 2.02**

IC641HBR300C	Max-ON Hot-Backup Software, Lite Edition
	PLC Folder release 2.04
	Max-ON Tools, build 2.02.014
	Max-ON Helpfile, build 2.02.005
IC641HBR301C	Max-ON Hot-Backup Software, Standard Edition
	PLC Folder release 2.04
	Max-ON Tools, build 2.02.014
	Max-ON Helpfile, build 2.02.005
IC641HBR302C	Max-ON Hot-Backup Software, Extended Edition
	PLC Folder release 2.04
	Max-ON Tools, build 2.02.014
	Max-ON Helpfile, build 2.02.005
IC641HPD001C	Max-ON Hot-Backup Software, Distributor Demo, Single CD
IC641HPD010C	Max-ON Hot-Backup Software, Distributor Demo, 10 CD Package

Introduction

This document contains information about this product that is not available in any other publication; therefore, we encourage you to read it and then save it with your other PLC documentation. This document covers release 2.02 of Max-ON Hot-Backup Redundancy Software which includes Max-ON Tools, PLC Hardware Configuration folders, PLC Redundancy folders, and Max-ON Remote Drop folders.

General Description

Max-ON Software, release 2.02, provides support for Series 90™-30 Hot-Backup redundancy using one or more Genius™ busses interfaced to Genius I/O, VersaMax™ I/O, Field Control™ I/O or a special implementation of Series 90-30 Remote Drops.

Max-ON Release 2.02 Highlights

1. Max-ON Tools Software has been revised so that it is compatible with VersaPro 2.00 (and later) programming software. A new set of PLC folders has been provided. These folders have change the manner in which Max-ON configuration data is made available to the PLC redundancy drivers. Also, several operational issues in the redundancy drivers were resolved.

2. The online diagnostic tool has been revised so that it uses a built-in communication driver rather than the server that is employed by VersaPro programming software.

3. This release expands the capabilities for VersaMax I/O configuration. Max-ON Tools software and the PLC redundancy drivers have been enhanced to support VersaMax expansion racks.

4. This release provides selections for Genius bus communication options. The configuration utility and the PLC redundancy drivers have been enhanced to allow the full range of Genius bus baudrate selections.

5. This release eliminates several problems associated with Remote Drop operation. A new set of Remote Drop folders has been included.

Foldername	*CPU Model*
m23d106	CPU323 and higher
m31d106	CPU331 and higher
m40d106	CPU340 and higher
m5Sd106	CPU350 and higher
m5Ld106	CPU351 and higher

6. This release corrects a problem associated with attempting to install Max-ON Tools software on workstations that are not configured for English language. Starting with this release, the tools may be installed, regardless of language settings.

7. This release corrects a problem encountered during installation in which system software components were being used by other applications.

Max-ON Release 1.21 Highlights

1. Additional folders have been included to offer more CPU model selections in Remote Drop I/O implementations.

Foldername	*CPU Model*	*Release*
m23dxyy	CPU323 and higher	1.10 and 1.21
m31dxyy	CPU331 and higher	1.21
m40dxyy	CPU340 and higher	1.21
m5Sdxyy	CPU350 and higher	1.21
m5Ldxyy	CPU351 and higher	1.21

2. This release corrects operational deficiencies in the PLC executables.

3. This release clarifies certain Helpfile issues in the Max-ON Tools software.

Max-ON Release 1.10 Highlights

1. The Max-ON PLC drivers provide support for various modes of CPU Mastership.
    a   PLC A is always the preferred Master. (If Master A fails, then B will become Master. When A is restored to service, then B will transfer Mastership to A.)
    b   PLC B is always the preferred Master. (Similar to A.)
    c   There is no preferred Master. A and B are equal in preference. (For example, if Master A fails, then B will become Master. When A is restored to service, B will remain Master.)
    d   Switch (toggle) the Mastership upon command from the user application or from an HMI.

2. The Max-ON PLC drivers provide support for exchange of system data and will synchronize a set of user-defined variables by way of Genius bus. Max-ON Extended may be configured to provide data exchange by way of Ethernet LAN. The system designer specifies the type and range of data to be exchanged. The data sets depend upon the product used as the basis for the project.
    a   Registers in the range of %R00001 through %R08000, inclusive.
    b   Internal coils in the range of %M00001 through %M02048, inclusive.
    c   Discrete outputs in the range of %Q00001 through %Q02048, inclusive.
    d   Analog outputs in the range of %AQ00001 through %Q00256, inclusive.

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3. The Max-ON PLC drivers provide support for VersaMax I/O by issuing contiguration datagrams to the Genius Network Interface Unit (GNIU).
    a. The driver will issue datagrams automatically to a device each time it logs onto the Master PLC.
    b. The packet always includes Hot-Backup controller settings.
    c. The packet always includes extended default timeout period.
    d. The packet sets the BSM controller parameter to accomodate single or redundant I/O bus connectivity.

4. Depending upon the product, the Max-ON PLC drivers provide support for either simplex bus connections (i.e., a single bus interface) to the I/O devices, or dual bus connections (a redundant interface.)
    a. IC641HBR300 (Max-ON Lite) supports only one simplex I/O bus.
    b. IC641HBR301 (Max-ON Standard) supports either two simplex I/O busses or one dual bus.
    c. IC641HBR302 (Max-ON Extended) supports up to eight simplex I/O busses or up to four dual busses, or some combination of the two, as long as there are no more than eight bus controllers in any PLC.

5. Max-ON Tools Configuration Software is used to specify the I/O components, the bus topologies and the quantities of data to be transferred from the Master PLC to the Backup PLC. The configuration software creates new project files from the Max-ON PLC Template folders. After the configuration session has been completed, the software writes VersaPro compliant subroutines directly into the project folder.

6. Max-ON Tools Diagnostic software is used to extract and display realtime information from the two PLCs that comprise the Hot-Backup controllers. The software displays diagnostic fault messages and extra system information that are generated by the Max-ON PLC drivers.

Replaces Software Versions

Release 2.02 of Max-ON Hot-Backup Redundancy Software replaces version 1.21 or earlier.

Documentation

GFK-2053   Max-ON Hot-Backup System Software User's Manual

GFK-1670   VersaPro Programming Software User's Guide

GFK-1868   Getting Started Manual (CIMPLICITY ME)

GFK-1918   Getting Started Manual with LD-PLC (CIMPLICITY ME)

Operational Notes

Minimum Workstation Requirements for Max-ON Tools Software

	For Windows 95 and Windows 98		For Windows NT		For Windows 2000, Windows XP[1]	
System Features	**Minimum**	**Recommended[1]**	**Minimum**	**Recommended[1]**	**Minimum**	**Recommended**
CPU	486/66 MHz	Pentium 133 MHz	486/66 MHz	Pentium 133 MHz	Pentium 2	Pentium 4
RAM (in MB)	16	32	24	64	128	256
Free Hard Disk Space for installation (in MB)	64	64	64	64	64	64
Free Hard Disk Space for operation (in MB)	50	50	50	50	50	50
CD-ROM Drive	Yes	Yes	Yes	Yes	Yes	Yes
VGA Monitor	Yes	Yes	Yes	Yes	Yes	Yes

Operating Systems Supported

- Windows 95B
- Windows 98 (First Edition Service Pack 1, Second Edition)
- Windows NT 4.0 (Service Pack 5, Service Pack 5 international version, Service Pack 6)
- Windows 2000
- Windows XP

VersaPro Compatility

Max-ON Tools software is compatible with VeraPro software, release 2.00 and higher. Please refer to the GE Fanuc website for additional information when using VersaPro software. The URL is:

http://www.gefanuc.com/support/plc/criticalcontrol.htm

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[1] Refer to the programming software user's manuals for additional system requirements.

Product Matrix

Catalog Number	Description	CPU Models	Maximum I/O Busses	Ethernet Data Transfers?
IC641HBR300	Max-ON Lite	350, 351, 352, 360, 363, 364 or 374	1	no
IC641HBR301	Max-ON Standard	351, 352, 360, 363, 364 or 374	2	no
IC641HBR302	Max-ON Extended	351, 352, 360, 363, 364 or 374	8	yes[2]

Series 90-30 CPU Firmware Release Requirements

IC693CPU350-BD   firmware version 9.10 or later

IC693CPU351-GP   firmware version 9.10 or later

IC693CPU352-DF   firmware version 9.10 or later

IC693CPU360-BD   firmware version 9.10 or later

IC693CPU363-AA   firmware version 9.10 or later

IC693CPU364-AD   firmware version 10.00 or later

IC693CPU374-BF   firmware version 11.04 or later

Series 90-30 Ethernet Module Firmware Release Requirements

IC693CMM321-EK   firmware version 2.02 or later.

Series 90-30 GBC Firmware Release Requirements

IC693BEM331K   firmware version 1.7 or later.

VersaMax GNIU Firmware Release Requirements

When using VersaMax I/O, the firmware for the Genius Network Interface Unit must be release 1.50 or later for dual bus (i.e., redundant bus) operation. It must be 2.0 or later for single bus operation.

Special Operational Notes

VersaPro Version Compatibility

This release of Max-ON Tools configuration software is directly compatible with VersaPro release 2.00 and later.

Program Folder Compatibility

A project folder that was created in version 1.21 or earlier of Max-ON Tools should be copied and then upgraded to this latest release. The two hardware configuration folders, the Max-ON program application folder, and any remote drop folders must be opened and converted to the new program structure using VersaPro 2.00 and later. The project application database must be opened and converted using Max-ON Tools configuration software.

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[2] A Max-ON Extended system employing the IC693CPU374 must use the IC693CMM321 module for Ethernet data synchronization.

Max-ON Diagnostics

A revised utility for Online diagnostics is available in this release.

Problems Resolved From Version 1.21

Max-ON Tools Configuration Software

1. **VersaPro 2.0 Compatibility.** VersaPro release 2.00 changed the construction of various source files in the Max-ON program folder. As a result, Max-ON Tools was not able to construct configuration files that were recognized by the programming software.

   Resolution: As of Release 2.02, Max-ON Tools software constructs files that are compatible with VersaPro 2.00 directly. A new block, Cfg_Dat.blk, contains the Max-ON configuration data. Max-ON tools revises the block each time the project is modified.

2. **VersaMax expansion racks were not accessible in the configuration session.** Max-ON Tools configuration software did not display configuration options for expansion racks in VersaMax I/O drops.

   Resolution: A checkbox is available for each device on the I/O Lan. If VersaMax I/O has been selected, then the checkbox will be examined, and an appropriate entry will be made in the Max-ON configuration file.

3. **Genius baudrate settings were fixed at 153.6k, Standard**. The Genius bus baudrate settings were fixed at the default setting of 153.6 kbaud, standard. For systems using VersaMax I/O, the baudrate must be configurable so that appropriate configuration datagrams may be issued automatically when the I/O devices come online.

   > **Note:** These config parameters are set in the PLC at %AQ0385 - %AQ0512.
   > Customers converting from an older Max-ON product must verify there is no conflict
   > in this area.

   Resolution: A dropdown list with all available Genius bus baudrate settings has been added.

4. **PLC keycode could not be entered offline.** The authorization keycode is obtained from CPU A while in the online mode only. In certain circumstances, it might be necessary to produce the program folder, with authorization codes, while in the offline mode.

   Resolution: Keycode entry is available while in offline mode.

Max-ON Tools Redundancy Drivers (PLC Folders)

1. **Discrete and Analog Outputs might not update properly in the Remote Drops.** Discrete and analog outputs configured to be active in Remote Drops would not update under certain circumstances.

   Resolution: This problem has been corrected in Release 2.02

2. **Synchronized Variables do not map properly (applies to Max-ON Extended only).** Synchronized data in %M type memory was incorrectly handled by the de-multiplexer, resulting in incorrect data updates to the backup CPU. The length of data it was reading exceeded the working buffer area, and incorrect values were mapped into the backup data tables.

   Resolution: This problem has been corrected in Release 2.02

3. **Initialization of a Versamax device causes a loss of output data**. A device, configured as VersaMax, logging onto the Genius LAN triggers the transmission of a configuration datagram. The Max-ON redundancy drivers were sending the datagram too frequently, especially in the case of dual bus. In attempting to process consecutive datagrams, the Versamax drop would sometimes default its outputs for several seconds.

   Resolution: This problem has been corrected in Release 2.02

4. **Occasional missed packets during Sync data transfers.** %Q, %M, and%AQ data occasionally miss one cycle of update through the system's mux/demux service. It is unlikely that a customer would have noticed this condition. It would have resulted in occasional lags in updating remote 9030 drop outputs, or lags in updating blocks of sync

data to the backup. In one scenario, however, it could be more serious. If the system operates with a preferred Master then the following scenario might expose the problem:

a.   The preferred master fails, resulting in the backup assuming control.

b.   The failed unit is repaired or replaced.

c.   The failed unit is placed in run, thus operating as the backup until it recognizes that it has received a full set of Sync Data. If one or more packets is missed during this time, then the unit might start operating as the Master before is should.
Resolution: This problem has been corrected in Release 2.02

d.   **Sync OK bit coming on too soon with Ethernet synchronization.** Under certain conditions, the Ethernet synchronizing logic would set the sync data complete bit, %M1021, true before the entire sync data cycle had completed. This would only cause a problem in a preferred master configuration where it would assume control before a complete update had occurred.
Resolution: This problem has been corrected in Release 2.02

e.   **Incorrect register update time with Ethernet synchronization.** The register containing the value for the register update time for synchronized data was incorrect for Ethernet operation.
Resolution: This problem has been corrected in Release 2.02

f.   **Stand-alone mux packet timer was running at half speed.** When the Master and Backup CPUs are available, multiplexer packets are advanced by way of handshake signals between the two CPUs. In the event that there is only a single CPU, the handshake mechanism ceases. In this case, a freerunning timer is used to advance data packets so that remote I/O drops will continue to operate. In releases prior to 2.02, the timer was operating at half the proper frequency. This would result in a slower update time at remote drops if one of the redundant CPUs failed.
Resolution: This problem has been corrected in Release 2.02

Remote Drop Folders

1.   **Discrete and Analog Outputs start in Hold-Last State.** Discrete and Analog Outputs configured in the Remote Drop Folder start operation using the values from their last state.
Resolution: This problem has been corrected in Release 2.02

2.   **Outputs reset due to Remote Drop watchdog timer**. The remote drop monitors the multiplexer cycle from the master in order to reset its local watchdog timer. If no update is seen in 2.5 seconds, then analog and digital outputs at the remote drop will assume their default values. In previous versions of the remote drop folder, if the configured %M transfer was large, and the CPU scan times and genius bus scan times were long, the remote drop unit could default the output data for a short period every sync cycle, causing the outputs to flash off and on.
Resolution: This problem has been corrected in Release 2.02

3.   **Remote drop program could not process analog output data above %AQ192 if master sync data transfer was above %AQ200**. If the master sync data limits were set to 200 or below, the remote drop would receive %AQ192 - %AQ200 correctly. If the master sync data limits were set above 200, the remote drop de-multiplexer would exceed its array limit, and not map in the data for %AQ192 - %AQ200.
Resolution: This problem has been corrected in Release 2.02

Installation

1. It is recommended that you close all applications including virus checking, Internet Explorer, and CIMPLICITY HMI software that might be running in the background. You may need to check the task manager to determine if other applications are running.

2. Insert the Max-ON CD into the CD-ROM Drive.

3. Select the CD drive from Windows Explorer.

4. Double click *Setup.exe*.

5. Follow the user prompts to complete the installation. If you have a previous version of Max-ON Tools installed, the installation tool will overwrite files with older version numbers or files with older dates. Previous Max-ON template folders will remain on your system. However, Max-ON Tools will use the template folders with the latest release numbers when creating new projects.

Starting the Max-ON Tools Application

The Max-ON Tools application is installed in the *GE Fanuc Software Program* group. The application can be started by any of the following:
*   From the Start Menu, select *Programs→GE Fanuc Software→ Max-ON*, or
*   Create a shortcut to the Max-ON application and place the shortcut on the desktop, or
*   Click on a file created by Max-ON (the file in the project folder with a *.mxn* extension), and start the application in the context of the selected folder.

Upgrading an existing Max-ON Project to Release 2.02

A project created in earlier versions of Max-ON Tools must be upgraded using the following procedure.

Create a New Project Folder

1. Using Max-ON Tools, create a new project folder of the same type as the existing folder. (For example, if your existing folder is Max-ON Standard, then the new project folder should be Max-ON Standard as well.)

2. The name of your new project should be related to the name of your existing project. A suggestion is to include a revision number or letter in the project name. For example, if your old project is named *MyProj* then the new project might be named *MyProj01*.

Convert Your Existing Project Using VersaPro 2.0

3. Locate your existing project folder. This folder will have the extension *.prj*. Using VersaPro, browse within the project folder and then open the folder for the hardware configuration folder for PLC A. VersaPro will produce a message that states that the folder was created in an earlier version. Allow VersaPro to convert the folder to the new version.

> **Note**: *Once you have converted the current folder, it is no longer compatible with earlier versions of VersaPro. Make certain that you have backup copies of the folder if you must retain compatibility.*

4. Repeat step 3 using the hardware folder for PLC B.

5. Repeat step 3 for the Max-ON application folder that contains the redundancy drivers and your application.

Open Your New Project Folder

6. Open a second instance of VersaPro programming software by using either *Start →Program→GE Fanuc Software→VersaPro* or by using the VersaPro shortcut on your computer's desktop.

7. Open the project folder in the new project that you created in Max-ON Tools.

Copy Your Existing Application

Recall that the first instance of VersaPro has your old project folder.

Rungs Prior to Max-ON Subroutine -

8. With the main portion of the logic displayed, select any rungs that you have added prior to the call to HBR_000. Copy these rungs using either the toolbar, Edit menu, or the key combination Ctrl-C.

9. Activate the second instance of VersaPro (the one that contains the new project.)

10. Insert a row prior to the call to HBR_00 and then paste your logic into the program.

Rungs Following the Max-ON Subroutine -

11. Select any rungs that you have added that follow the call to HBR_000.

12. Activate the second instance of VersaPro (the one that contains the new project.)

13. Select the rung that follows the call to HBR_00 and then paste your logic into the program.

Copying Project Subroutines -

14. Activate the first instance of VersaPro (the one that contains your old project folder.)

15. Make certain that the project browser window is displayed. If it is not, then select *View→Folder Browser*.

16. Locate any subroutines that you have created separately from the subroutines that are part of Max-ON redundancy drivers.

17. Select the first subroutine that is part of your project.

18. Using either the toolbar, Edit menu, or the key combination Ctrl-C., copy this subroutine.

19. Activate the second instance of VersaPro.

20. Paste the subroutine into the project browser window.

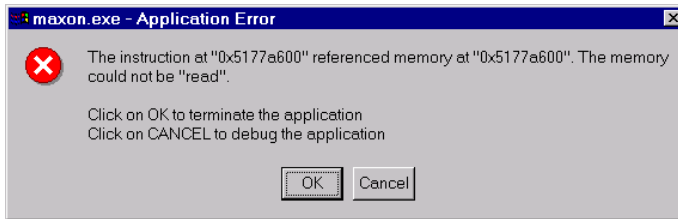21. Repeat steps 14 through 20 for each subroutine that is part of your application.

Open Issues and Problems

Open issues in Max-ON Tools 2.00

1. **When exiting Max-ON Tools software you may receive the following Windows error message.** This occurs perhaps one out of ten times.

   Suggested Resolution: Click on *OK*. This problem appears to be cosmetic in nature only. There is no permanent effect on the operating system or other applications that are running at the time the message appears.

2. **When a Max-ON project folder has been opened in VersaPro programming software, and you perform a *Folder→Check All*, the information window will display between 25 and 28 warnings.**

   Suggested Resolution: None. This is normal behavior when VersaPro software checks the Max-ON PLC drivers (i.e., the subroutines named HBR_000 through HBR_099.) The subroutines are valid.

3. **Output devices installed on a dual Genius bus will exhibit a bus switching event if CPU B is the current Master and then CPU B fails.**

   Suggested Resolution: None. This is normal operation. (It relates to enabling the output data streams on the CPU A Genius bus controllers when CPU A becomes a Master.)

4. **Printing the configuration report in Max-ON Tools produces tabbed columns that are outside the page size.** When printing the configuration summary, Max-ON Tools may produce data columns that are beyond the right margin of the page. The result is that the rightmost data columns "wrap" into the areas of data columns to their left.

   Suggested Resolution: Set the page layout on the selected printer to *Landscape* and print the document As an alternate, you may save the configuration report to an *rtf* file. This file may opened in your word processing application. Once the file has been opened, edit the tabs to settings that accomodate your report format requirements.