
SERVICE BULLETIN

MAINTENANCE OF WAY EQUIPMENT

DATE: 04-2021

BULLETIN NO: 21-002

TITLE: JAM Box G4/G5 to G6 Conversion

RATING:

<input type="checkbox"/>	DIRECTIVE (Action Is Required)	<input type="checkbox"/>	ALERT (Potential Problem)
<input type="checkbox"/>	INFORMATION (Action Is Optional)	<input checked="" type="checkbox"/>	PRODUCT IMPROVEMENT (Enhance Product)

PRODUCT SERIES / MODEL: Harsco Rail Machines Equipped with Jupiter II Control System and G4 or G5 JAM Box.

SERIAL NO: N/A

SUMMARY: Instructions to replace the G4 or G5 JAM with G6 JAM on machines so equipped.

OPERATIONAL IMPACT: While the G6 JAM Box is primarily intended as a replacement for the previous generation of JAM BOXES, it does support faster operations, more RAM and updated peripherals support.

ACTION: Make sure to have your machine's Model Number(s), Serial Number(s) and Software Version (if known) available when contacting Harsco Rail about ordering a new G6 JAM Box.

The new G6 JAM Box is ordered through the Harsco Rail Parts Department (1-800-800-6410). It may also be necessary to contact the Harsco Rail Service or Sales Department to obtain the software update for your machine if not previously loaded on the JAM. The software update will be available via e-mail or sent to you on a USB Flash Drive.

If requesting the 6700SJ1 software upgrade via e-mail you will be required to have two USB Flash Drives available. One for the WORK JAM software upgrade and one for the INSTRUMENT JAM software upgrade. The software will be sent in two separate e-mails. A third e-mail will then be sent containing the Jupiter 1 Software Installation instructions. If the software upgrade for the 6700SJ1 is sent to you on USB Flash Drives, the Software Instruction document will be printed out and added to the package.

Follow the instructions in this Service Bulletin to replace the G4/G5 JAM Box with the G6 JAM Box.

CONTACT: Harsco Rail Service Department
Columbia, SC Facility
(803) 822-7546

Harsco Rail Service Department
Ludington, MI Facility
(231) 843-7413

G6 Jam Box Notes

1. The G4 and G5 JAM Boxes are officially at "end-of-life". The only replacement for it or any generation of JAM Box is another G4/G5 or upgrading to the G6.
2. The G6 is in the same hardware family as the previous G4 and G5 devices, and it installs and operates very similarly. This includes use of the same Jupiter-I or Jupiter-II J42 board. Therefore a G4 or G5 can be directly replaced with a G6.
3. While the overall footprint of the G6 is the same as the G4/G5 boxes, the connecting plugs and ports are not all on the same side as before. This means that when replacing a G4/G5 with a G6, some amount of cable relocation will be required.
4. Installing the G6 JAM Box requires an update to the newest release of Jupiter software capable of interfacing with unique G6 requirements.
 - a. There are no simple means to move pre-existing set-up, calibrations, and similar settings from an old JAM to a new G6.
5. The G6 Jam Box does not use the CF (Compact Flash) Card as found in the G5 JAM Box as its 'hard disk'. The G6 instead uses an mSATA drive similar to many modern laptops.
6. Once the software is updated for G6 use, multi-JAM applications can use a mix of JAM-box generation types (i.e. a mix of G4, G5 and G6).
7. In some Jupiter-II applications, a new software "Install Permission" panel now asks the user whether they want to shut down the machine application in order to download a new software package.
 - a. Press the "Esc" button to leave the USB drive installed but not install new software.
 - b. Press the "Enter" button to proceed to software install (Super-Download screen).
8. The G5 Jam Box has a PS/2 keyboard-mouse plug. The G6 Jam Box has eliminated this plug so the keyboard or mouse will be connected to the G6 via one of the USB ports. PS/2-to-USB converters are available to allow older keyboards and mice to connect to the G6, but purchasing newer USB-equipped peripherals may be easier to manage.
9. On newer machines, the G6 will in some cases start using HDMI connections for the Video, and a USB connection for the Touchscreen control.

Safety Information



- **FOLLOW APPLICABLE RAILROAD LOCKOUT - TAGOUT PROCEDURES AND MACHINE ENERGY CONTROL PROCEDURE TO DISABLE ENERGY SOURCES WHEN PERFORMING MAINTENANCE, MAKING ADJUSTMENTS OR REPAIRS TO THE MACHINE. FAILURE TO HEED THIS WARNING COULD RESULT IN SEVERE BODILY INJURY.**

G4/G5 to G6 Conversion - See Figure 1

1. Follow applicable Railroad Lockout - Tagout Procedure to remove the machine from all energy sources when performing maintenance, or making adjustments or repairs to the machine.

Important: BE SURE the Jupiter Control System and the master disconnect switch are shut OFF on the machine before installing the G6 JAM Box Conversion Kit.

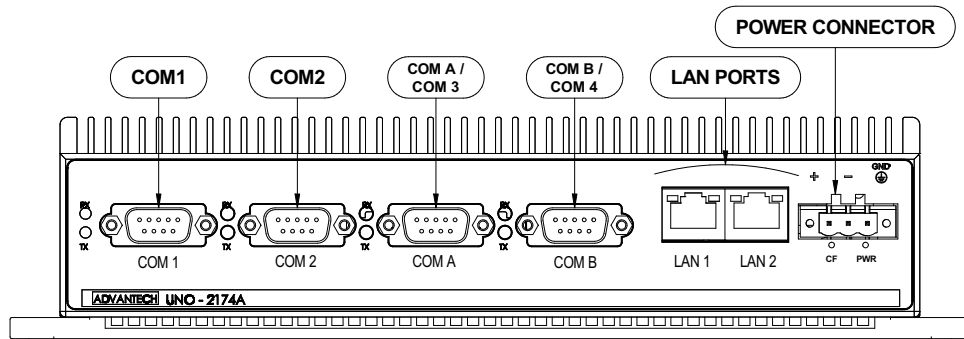
Connecting G4/G5 Cables to the New G6 Corresponding Locations

2. Label all the cables connected to the G4/G5 JAM Box with the descriptions shown on the G5 JAM Box front and rear views in Figure 1.
3. Disconnect the cables connected to the G4/G5 JAM Box. Note that the Printer connection and Audio Ports are not used. Remove the G4/G5 JAM Box from the panel mounting location.
4. Install the G6 JAM Box as shown in reference views on 5122636 - JAM BOX G5 TO G6 CONVERSION (Sheet 2). Re-use the mounting hardware that was used for the G4/G5.
5. Connect the cable marked VGA from the monitor to the VGA Connector on the G6 JAM Box.
6. Connect cables marked COM1, COM2, COM A and COM B to the COM ports marked on the G6 JAM Box.
Note: Cables connected to the G5's COM A and COM B will now connect to the G6's COM3 and COM4 respectively.
7. Connect the Ethernet cable (if multiple JAMs are used on the machine) marked LAN1 to the LAN A port and the cable marked LAN2 to the LAN B port on the G6 JAM Box.
8. Connect the cables marked USB PORTS to the USB Ports on the G6 JAM Box.
 - a. For the Printer - the G6 JAM Box doesn't support parallel printer cables. If not already installed, an updated USB printer may be required. Connect the new printer to the G6 JAM Box using one of the USB Ports.
 - b. Connect the Keyboard cable (if used) to any USB receptacle. Note that the traditional PS/2 connector for MS/KB does not exist on the G6 JAM and requires a newer USB keyboard connected using one of the USB Ports.
 - c. Connect the Mouse cable (if used) to any USB receptacle. Note that a traditional PS/2 connector for MS/KB does not exist on the G6 JAM and requires a newer USB mouse connected using one of the USB Ports.
9. POWER CONNECTOR (G5 Only) Connect the G5 plug of the cable marked Power Connector into the Power Connector receptacle on the G6 JAM Box.
10. POWER CONNECTOR (G4 Only): The G4 Power Connector uses a 2-pin plug that will need to be rewired to a 3-pin plug. The G6 comes with the required 3-pin plug installed or in the box.
Note: No wiring on the J42 Circuit Board needs to be changed. Follow the steps below to switch the 2-pin plug to the 3-pin plug.

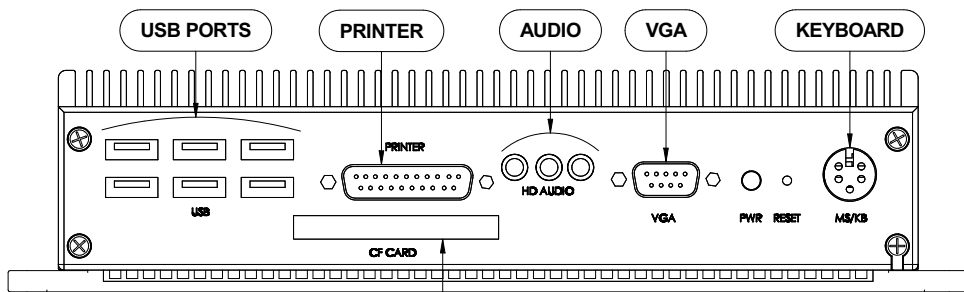
On the JAM 3-pin plug:

- a. The Red wire G4 "24V" goes to the G6 "+".
- b. The Black wire G4 "GND" goes to the G6 "-".
- c. The "GND" on the G6 is not connected.

FIGURE 1
G5 to G6 JAM BOX CONVERSION

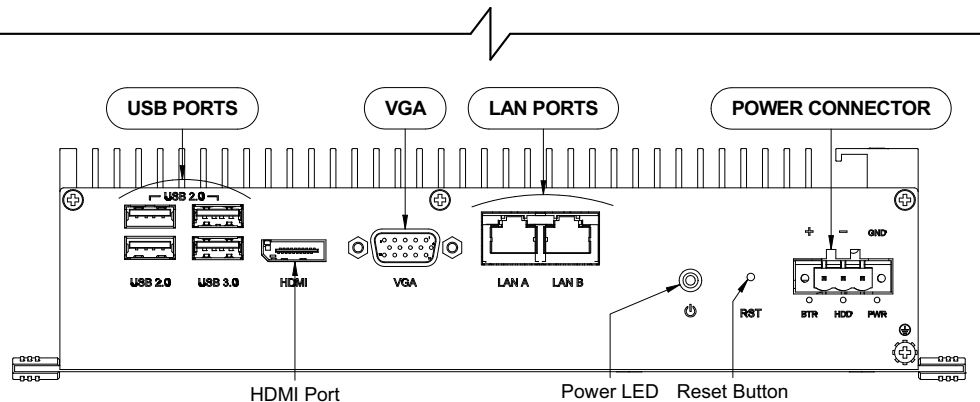


G5 JAM BOX (FRONT VIEW)

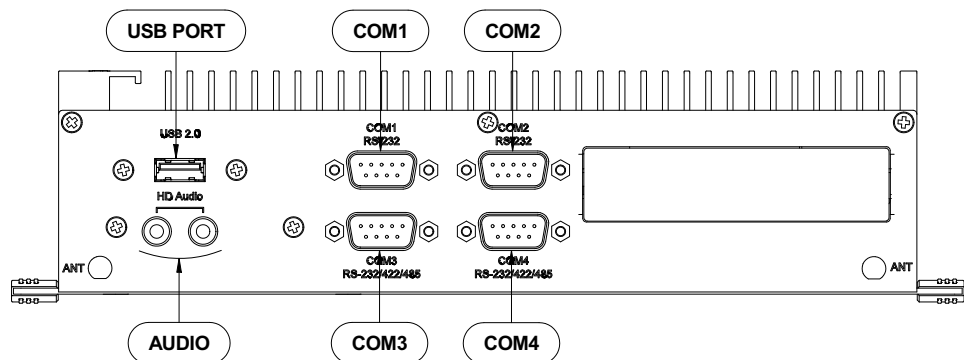


Compact Flash Card

G5 JAM BOX (REAR VIEW)



G6 JAM BOX (FRONT VIEW)



G6 JAM BOX (REAR VIEW)

System Boot-Up

1. If the G6 JAM was supplied pre-programmed for your machine, the machine application program will be started and all of the data files will be set to the default settings. Perform all calibrations and setup required before putting the machine in service.
2. If the G6 JAM has been supplied with only the base files and no application software, the JAM will boot up to the Jupiter splash screen to indicate that there is no software installed. The machine control software can be loaded using an "install.jam" file from a USB memory stick and all of the data files will be reset to the default settings. Perform all calibrations and setup required before putting the machine in service.

G6 JAM (Jupiter Application Master) - See Figures 2 & 3

1. The G6 JAM consists of the following:
 - (1) USB: The four USB front-side ports and one rear-side port are used to connect USB devices (printer, flash drives, memory sticks, mouse, keyboard, etc.) to the JAM.
 - (2) HD AUDIO - BLUE: The audio input connection is NOT USED.
 - (3) HD AUDIO - GREEN: The audio output connection is NOT USED.
 - (4) VGA: The video / graphics connection is used for the Touch Screen Monitor.
 - (5) POWER: The switch controls the power to the JAM. Press the switch to power down the JAM. Press the switch again to power up the JAM.
 - (6) RST: The reset switch is located inside the small hole. It requires a tool small enough to be inserted through the hole to reset the JAM. When pressed and released, the JAM will shut down and then reboot.
 - (7) COM 1: The serial port connection is used for the Touch Screen Monitor on many applications.
 - (8) COM 2: The serial port connection is NOT USED on most applications.
 - (9) COM 3: The serial port connection is used for the J42 Board.
 - (10) COM 4: The serial port connection is NOT USED on most applications.
 - (11) HDMI connection: For video, but NOT USED on most applications.
 - (12) LAN 1: The ethernet connection is used for communication between the JAMs on machines with a multiple JAM network.
 - (13) LAN 2: The ethernet connection is NOT USED on most applications.
 - (14) + / - / O: The +/- pins of the 3-pin connector are used for the J42 Board. The O pin (ground) of the connector is NOT USED.
 - (15) HDD LED: The LED will flash green when the hard drive of the JAM is transmitting or receiving data.
 - (16) PWR LED: The LED will illuminate green when 24V power is supplied from the J42 Board.

NOTE: If your machine previously used a parallel port connection to a line-printer, a USB capable line-printer (#351118-1) is required for the G6 JAM.

G6 JAM (Jupiter Application Master) (continued)

FIGURE 2
G6 JAM BOX (FRONT VIEW)

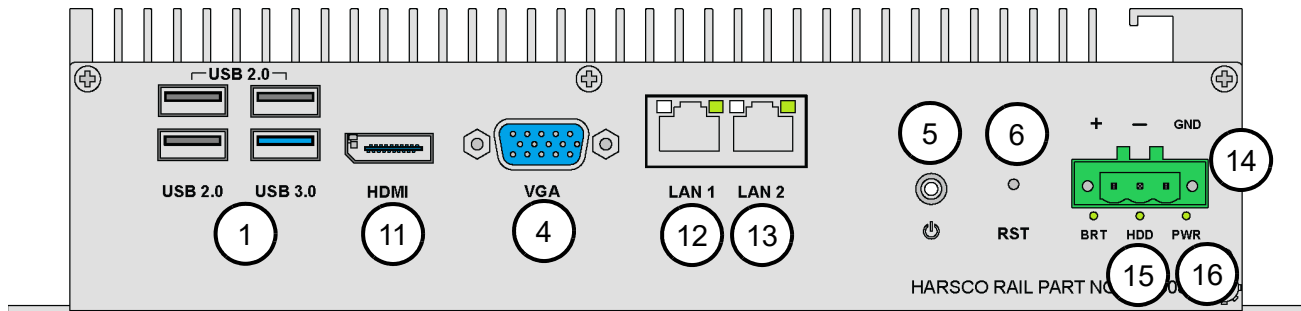
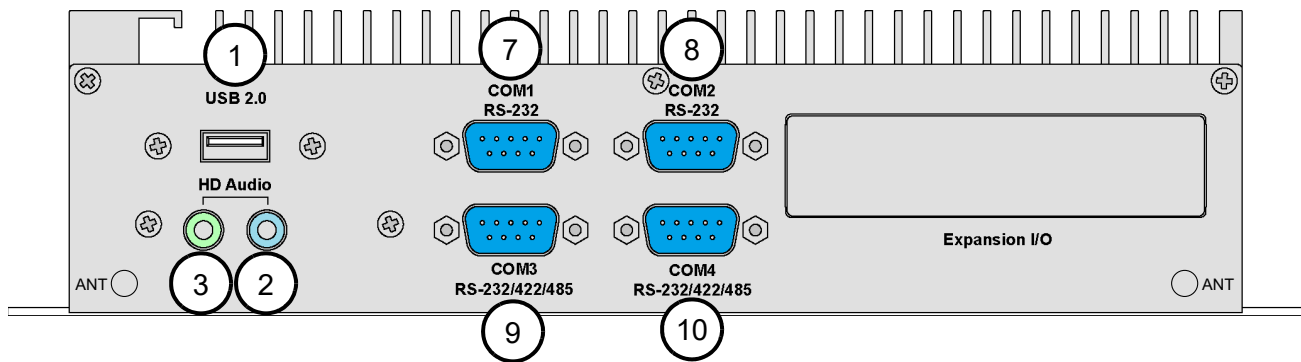


FIGURE 3
G6 JAM BOX (REAR VIEW)

**Battery Replacement - See Figure 4**

1. The G6 JAM incorporates an internal Battery. The battery should be replaced when the current time and date are lost during system power-down.
2. Battery Specifications:
 - a. Lithium Battery: BR2032 (see Note)
 - b. Output Voltage: 3 VDC

Note: Harsco Rail recommends using Lithium Battery BR2032 as it has better thermal performance in cold climates. Lithium Battery CR2032 is an acceptable replacement if the machine is not working in cold climates.

3. To replace the battery:
 - a. **Important:** It is recommended that the battery be replaced in a static free environment. Use of an Electro Static Discharge (ESD) pad and strap is recommended to help prevent damage to static sensitive devices on the circuit boards inside of the JAM.
 - b. **Important:** Make sure the Jupiter Control System is shut off.
 - c. **Important:** Make sure all 24 volt electrical power on the machine is shut off.

Battery Replacement (continued)

- d. Carefully disassemble the six screws securing the bottom cover plate to the JAM. This will allow access to the correct side of the circuit board where the Battery (1) is located.
- e. Carefully remove the existing Battery (1) from the battery holder on the circuit board. Use care not to damage the battery holder or the circuit board.
- f. Be sure the new battery meets the specifications listed above before installing the battery.
- g. Install the new Battery (1) in the battery holder on the circuit board. Use care not to damage the battery holder or the circuit board.
- h. Re-assemble the bottom cover plate onto the JAM. Secure with the six screws.
- i. Turn on all 24 volt electrical power to the machine.
- j. Turn on the Jupiter Control System to boot-up the JAM.
- k. Reset the current time and date on the Jupiter main panel.

FIGURE 4
G6 JAM BOX BATTERY



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56031-1837
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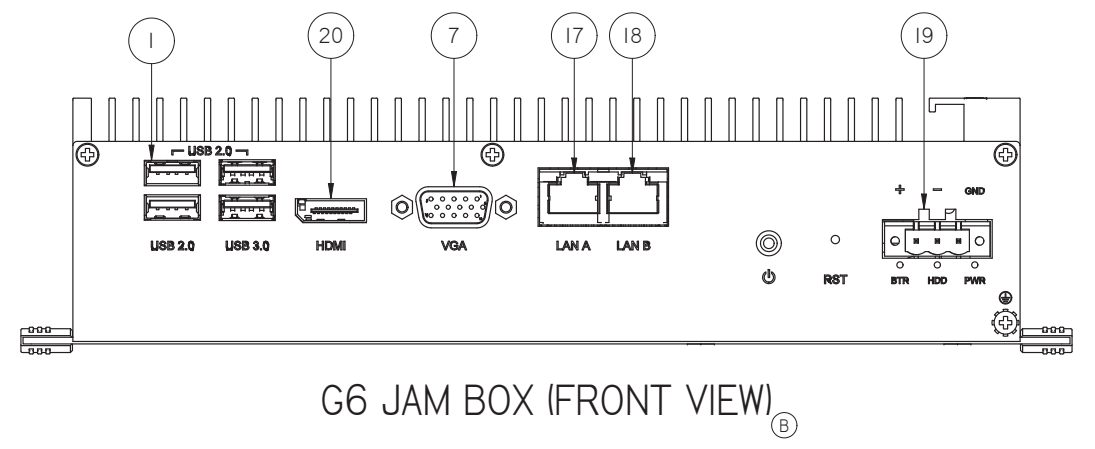
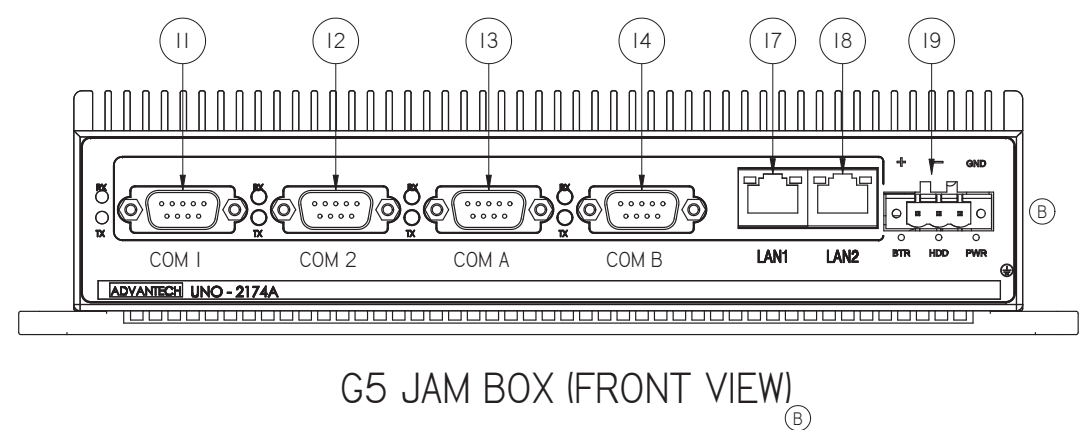
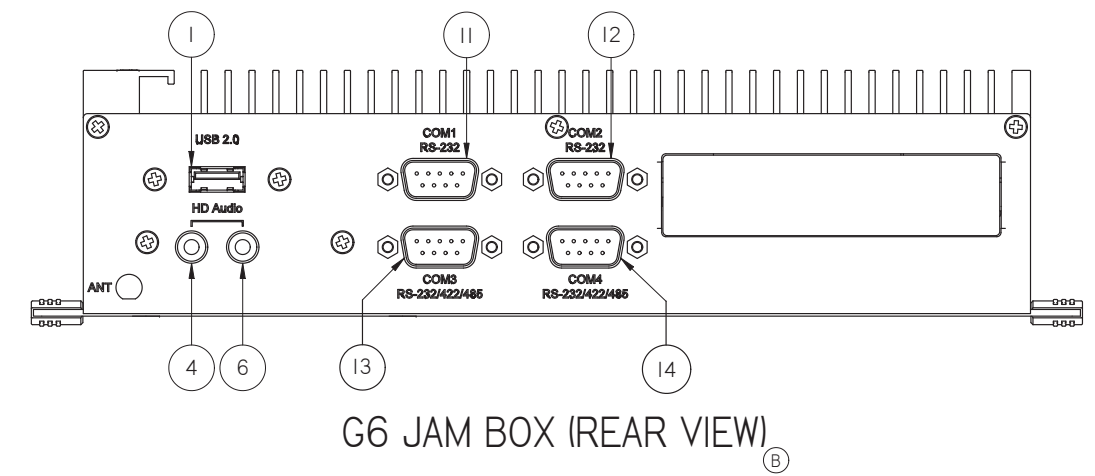
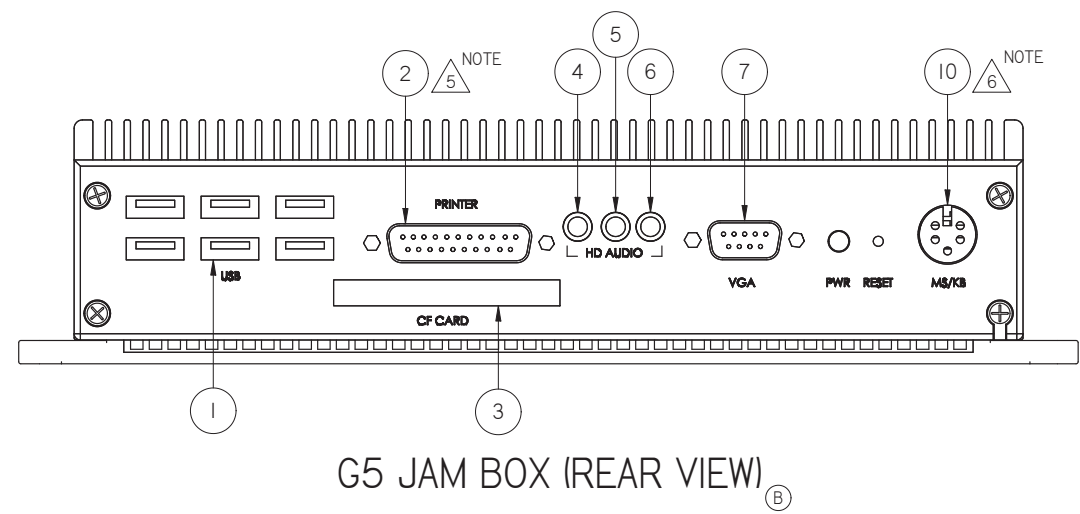
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NOTES:
 G5 TO G6 CONVERSION
 CONNECT G5 CABLES TO THE NEW G6 CORRESPONDING LOCATIONS

- 1) LABEL ALL THE CABLES GOING TO THE G5 JAM BOX WITH THE NUMBER ON THE G5 JAMBOX VIEWS.
- 2) REMOVE ALL THE CABLE GOING TO THE G5 JAM BOX AND REMOVE THE G5 JAM BOX FROM THE PANEL MOUNTING LOCATION.
- 3) INSTALL THE G6 JAM BOX AS SHOWN IN REFERENCE VIEWS ON SHEET 2.
- 4) INSTALL THE EXISTING JAM BOX CABLES TO THE G6 JAMBOX PER THE NUMBER ON THE G6 JAM BOX VIEWS
- 5) IF A CABLE WAS CONNECTED TO #2 ON THE G5 JAM BOX, A NEW DEVICE WITH AN USB CONNECTOR WILL BE NEEDED AND CONNECTED INTO #1 OF THE G6 JAM BOX.
- 6) IF A CABLE WAS CONNECTED TO #10 ON THE G5 JAM BOX, AN ADAPTOR CABLE WILL BE REQUIRED OR A NEW DEVICE WITH AN USB CONNECTOR WILL BE NEEDED AND CONNECTED INTO #1 OF THE G6 JAM BOX.



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FEATURES ENCLOSED IN C ARE KEY CHARACTERISTICS					
BEST			WORST		
NOMINAL	PLUS OR MINUS	3 PLACE DECIMAL	NOMINAL	PLUS OR MINUS	3 PLACE DECIMAL
0	6	.03	0	150	.8
6	24	.04	008	150	600
24		.06	010	600	1.5

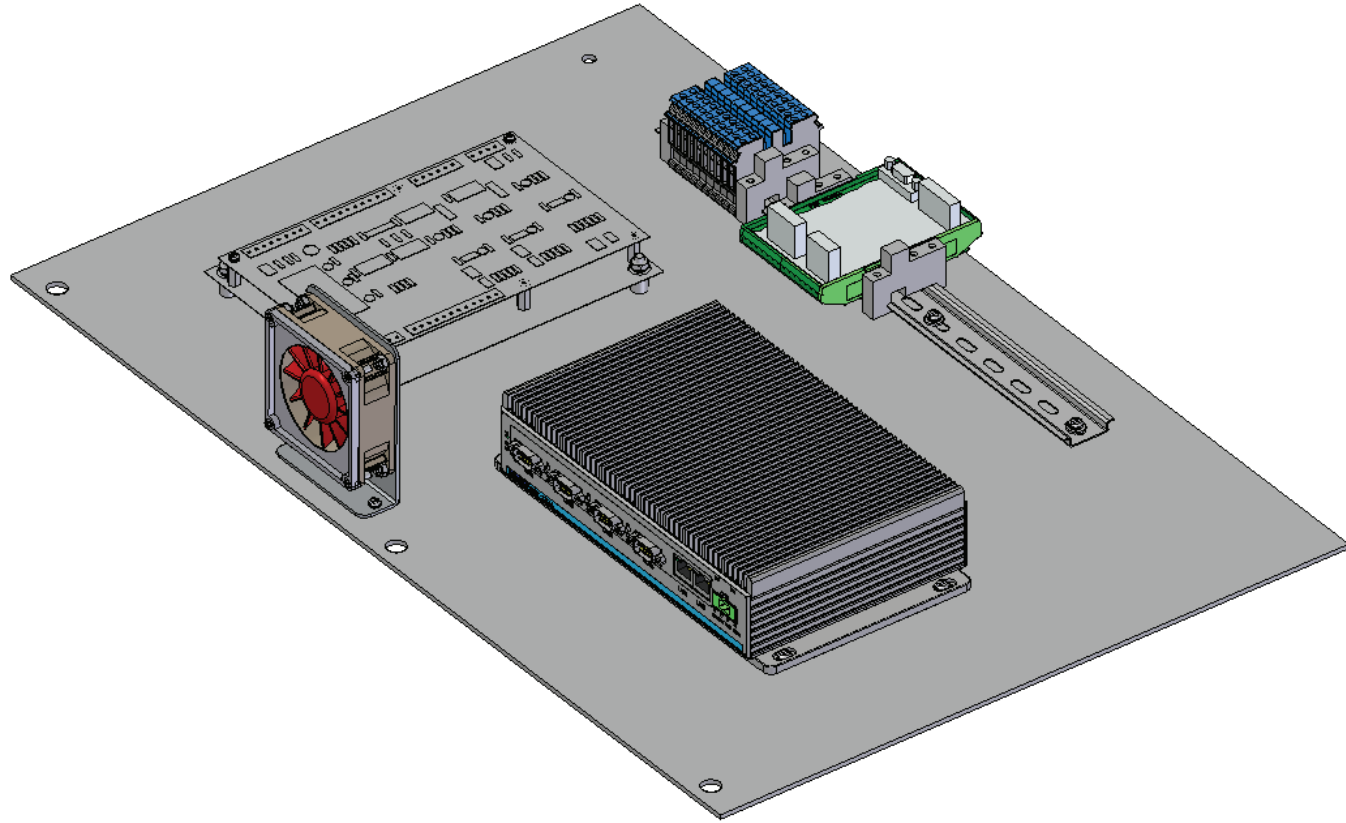
CHANGE	R/L	REVISION
EC614816	A	NEW RELEASE
EC615066	B	POWER CONNECTOR WAS 2 PIN. REVERSE FRONT & REAR VIEWS

DR	DATE	Description
WJG	02/24/21	JAM BOX G5 TO G6 CONVERSION
WJG	04/13/21	

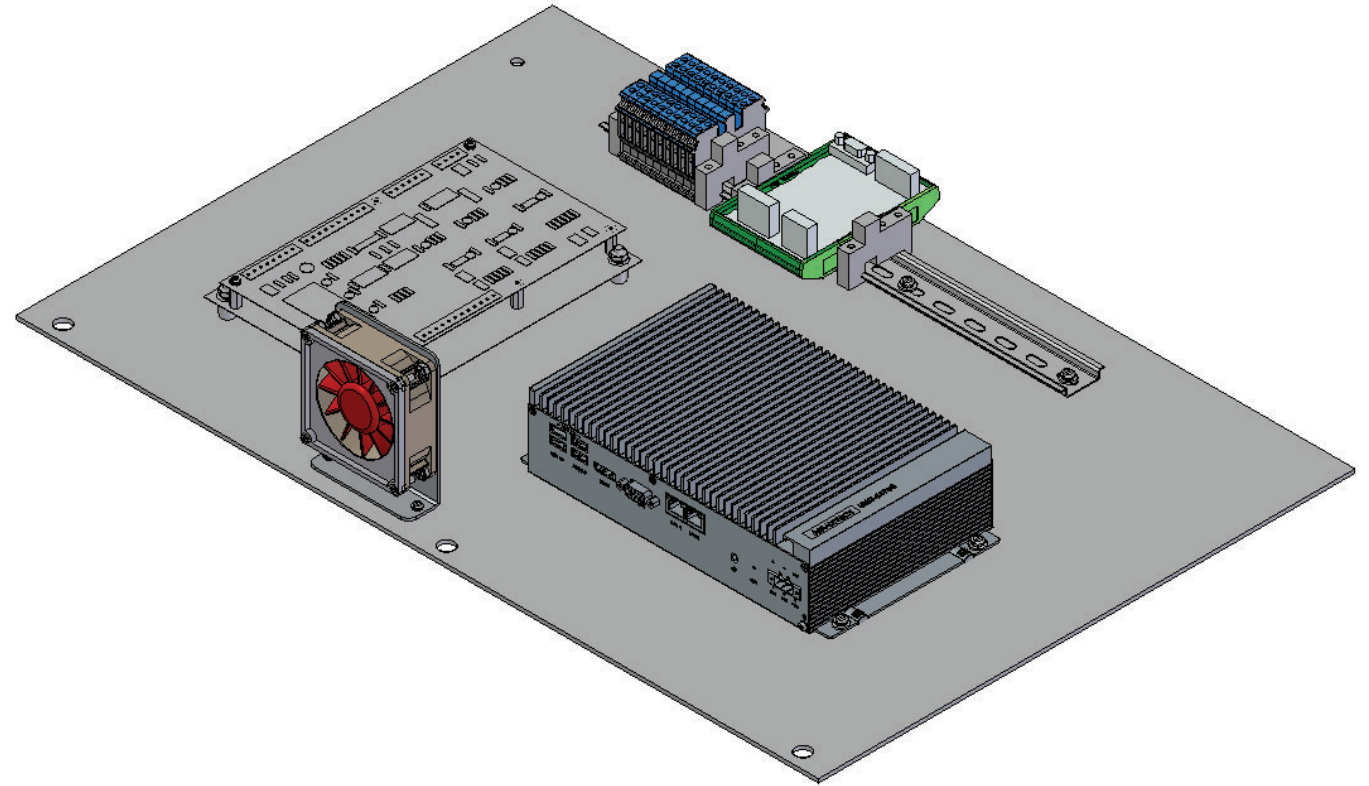
HARSCO RAIL	
Machine Type	COMPUTER CONTROL SYSTEM
Part Number	5122636
Weight	34.2 lbm
Drawn	wgrier
Date Drawn	2/24/2021
Material	SOLID EDGE DRAWING
Scale	DO NOT SCALE

Inch [mm]

Sheet 1 of 2



G5 JAM BOX



G6 JAM BOX

REFERENCE VIEWS ONLY

FEATURES ENCLOSED IN ARE KEY CHARACTERISTICS		UNLESS OTHERWISE SPECIFIED: 1. REMOVE SURFACES AND BREAK CHAMFER EDGES 2. ALL DIMENSIONS UNLESS OTHERWISE SPECIFIED ARE IN INCHES 3. SURFACE FINISH OF 125 MICRONS 4. ALL MACHINED SURFACES WILL HAVE AN ANGLE OF 45 DEGREES UNLESS OTHERWISE SPECIFIED		CHANGE	R/L	REVISION	DR	DATE	Description	MATERIAL		Machine Type	Part Number	Sheet
NOMINAL	TOLERANCE	PLUS OR MINUS	NOMINAL	PLUS OR MINUS	1	NEW RELEASE	WJG	02/24/21	JAM BOX G5 TO G6 CONVERSION	34.2 lbm	wgrler	2/24/2021	5122636	2 of 2
OVER	TO	0	OVER	TO	2	POWER CONNECTOR WAS 2 PIN. REVERSE FRONT & REAR VIEWS	WJG	04/13/21		SOLID EDGE DRAWING	DO NOT SCALE			
0	6	.03	0	150	.8									
6	24	.04	.008	150	600	1.0								
24		.06	.010	600		1.5								

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THIRD ANGLE PROJECTION
 DRAFTED PER HARSOCO RAIL STANDARD STD-1601D

HARSOCO RAIL
 JUPITER CONTROL SYSTEM

Inch [mm]

Sheet 2 of 2