GEMR-HS User Guide
For use with GEMR-HS Hardware

Document No: 70-00005
Date: Jun-21-2022

Change Log

Revision	Revision History	Date
-	Initial Release	11/07/2016
A	System Configuration update to reflect Data Port network address set by EDTC	11/14/2016
B	Added Jumbo frames and partition status limitations	9/5/2018
C	Added supported cartridges	9/17/2018
D	Added troubleshooting for large file transfers	04/23/2019
E	Updated textual descriptions. Minor typo corrections.	03/11/2020
F	Added DFARS statement Changed title page to standard	02/10/2020
G	Added footer	06/21/2022

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Contact Us

ITI Engineering LLC.
https://itiengineering.com

Ticket Center (product support)
https://itiengineering.com/ticketing/

Product Specifications

Spec	
Size	13.75" L x 9.5" W x 3.3" H (349.3 mm x 241.3 mm x 83.8 mm)
Chassis Weight	8.9 lbs. (4 kg)
Operating Temp	+10 to +40 C (+50 to +104 F)
Storage Temp	+10 to +40 C (+50 to +104 F)
Power	100/240 VAC 50/60Hz Max Current 1.5A Fuse 250V/T2A

Supported Cartridges

The GEMR-HS is verified to support the following EDTC cartridge configurations:
- AS2.0
  - Pass through mode only
- AS2.2, AS2.6, AS3.2 and AS3.7
  - High speed mode with jumbo frames support (FTP only)

Cartridges not listed above should utilize pass through mode for operation.

Notes

Warning:

This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Power Cords:

These devices should be installed in close proximity to socket outlets that are easily accessible.

These devices support universal AC input: 100/240VAC @ 50/60Hz. The product is sold in a base configuration with a North American AC power cord with the following characteristics: the device end has a 3-prong "PC" power type C13 beveled connector; the wall outlet end has a US type 110-volt outlet connector.

For specific country power cords, contact the manufacturer or purchase the needed power cord directly from an international power cord provider.

About

This guide provides the information needed to setup and use the GEMR-HS. The GEMR-HS receptacle provides the capability to read and write data cartridges while interfacing with the client system as a network appliance. This guide does <u>not</u> include information on the applications used to access, write, or read data cartridges used in the GEMR-HS receptacle.

Key features of the GEMR-HS over the GEM/GEMR include:

- Provides a high-speed FTP interface with 5X increased performance
- User display of network configuration settings
- Pass through mode that replicates the GEM/GEMR network interface

Hardware Overview

Front Panel
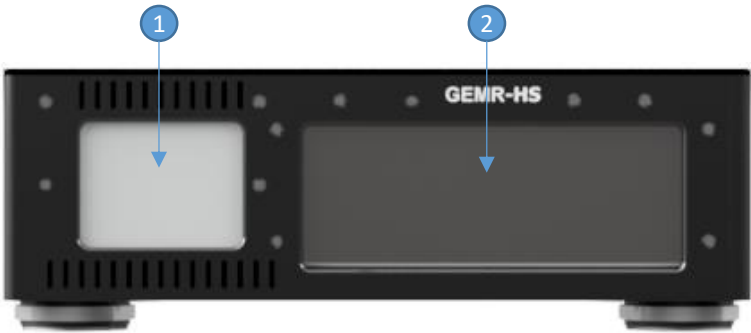
	ITEM	DESCRIPTION
1	Touch Screen	Main user interface to control the read/write operations of the PMD cartridge. Displays status information of the operation in progress.
2	Cartridge Slot	Insert an EDTC facing upwards.

Rear Panel
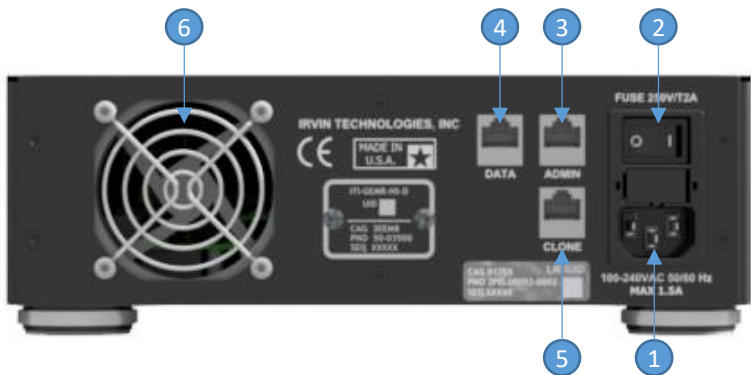
	ITEM	DESCRIPTION
1	Power Connector	Industry standard IEC power cord interface supporting a 3-prong "PC" power type C13 beveled connector. Connect the power cord to the power connector.
2	Power Switch	System main power switch. When in the "1" or ON position, the internal AC-DC power supply is energized and the receptacle is ready to support an EDTC.
3	Admin Port	Gigabit Ethernet port used for out of band management. The GEMR-HS is configured using a TELNET session into this port (see System Configuration section).
4	Data Port	Gigabit Ethernet data port. **NOTE:** *It is recommended that you use a shielded CAT5e or higher patch cord to connect the GEMR-HS to the network infrastructure.*
5	Clone Port	Gigabit Ethernet port used to daisy chain multiple GEMR-HS systems together (*future feature not currently implemented*).
6	Exhaust Fan	Exhaust fan. Do not block the exhaust fan or overheating may occur.

System Deployment

The GEMR-HS can be configured as a point-to-point network device or as a device connected to a Local Area Network (LAN).
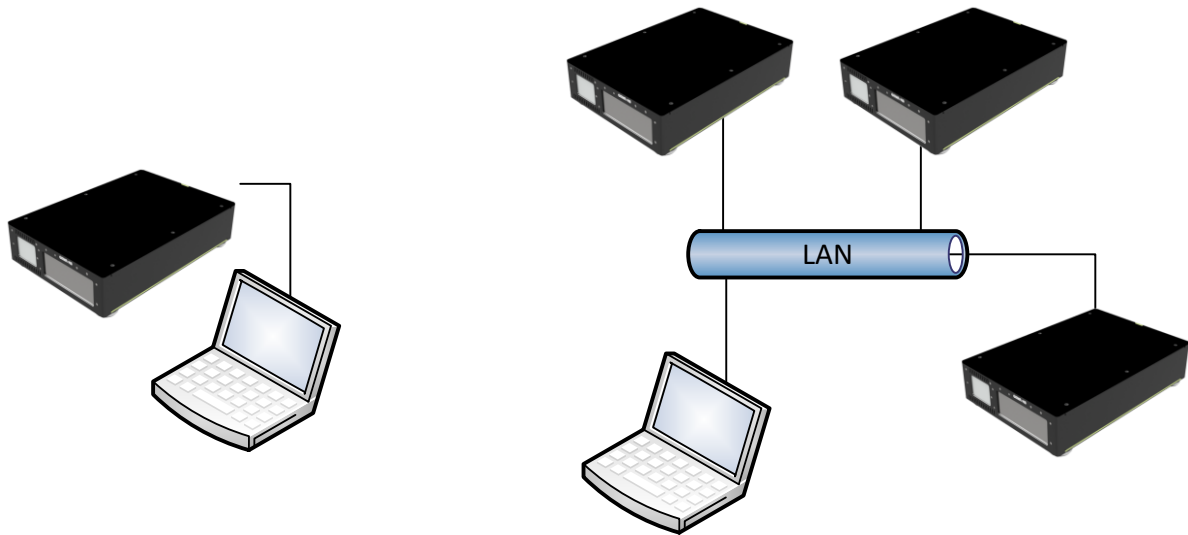
The GEMR-HS provides all the same functionality for EDTC access as the GEM/GEMR with the addition of out of band management configuration.

SOFTWARE OVERVIEW

The GEMR-HS provides the network interfaces to the EDTC. The system has three operating modes:

- System Configuration
- Normal Operation mode
- Pass through mode

The GEMR-HS is designed to optimize data transfer to/from the EDTC using the FTP protocol. The GEMR-HS FTP Server interface operates the same way the GEM/GEMR FTP interface. All legacy commands are supported with the following updates:

- "rmdir(RMD)" command performs a recursive delete of the directory and all of its contents

The EDTC web interface is accessed exactly the same as the GEM/GEMR. Connect a properly configured computer to the Data Port interface, open a web browser and enter the IP address displayed on the EDTC Screen.

The EDTC CIFS interface is exactly the same as the GEM/GEMR. Connect a properly configured computer to the Data Port interface, open Microsoft Windows Explorer and enter the IP address displayed on the EDTC Screen.

NOTE: Do not use CIFS with JUMBO frames. If this occurs either change the Data Port MTU size to 1500 or place the GEMR-HS into passthrough mode.

Operational Modes

System Configuration

Configuration mode is used to configure the GEMR-HS network interface. The GEMR-HS can only be configured using a computer with a network connection to the Admin port. The computer must be on the same network as the Admin port. Touching the display (with no cartridge inserted) changes the screen to the Out-Of-Band Management (OOBM) screen and displays the Admin port network configuration:
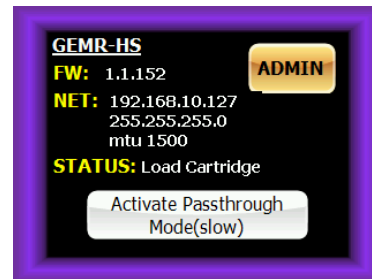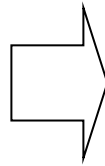
The default administration settings are shown below.

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Item	Default	Description	
Data port	<EDTC IP> <EDTC Netmask> mtu 9000		Network address and MTU size of the data port. The network address is set by the EDTC. The data port provides the interface for clients to transfer data to/from the EDTC.
Oobm port	192.168.10.127 255.255.255.0 mtu 1500		Network address and MTU size of the admin port. The admin port network access is required to configure the device.
Name	GEMR-HS		Name of the device displayed on the default touch screen.

A Command Line Interface (CLI) is provided via a TELNET session into the Admin port. The following commands are available through the CLI.

NOTE: *Commands are case sensitive.*

Base commands	
cfg	Enter the configuration daemon to configure the GEMR-HS (*see next page*).

Example:
Open a command prompt (*must have telnet client installed*).
Run: **telnet 192.168.10.127**

```
[cfg@localhost ~]$ cfg
CMD> print
-----------------------------------------------
NAME GEMR-HS

>oob_port
  ip_address=192.168.10.127
     netmask=255.255.255.0
         mtu=1500

>data_port
  ip_address=<configured by EDTC Web page>
     netmask=<configured by EDTC Web page>
         mtu=9000
CMD>
```

Configuration Daemon

Use the configuration daemon (*cfg*) to set IP addresses, ports, and the name of the device. Once in the configuration daemon the following CLI commands are available.

NOTE: *Enter all commands on a single line. Commands are case-sensitive.*

General Commands	
help	Prints list of commands.
print	Prints the current configuration
save	Saves any changes that were made to the configuration.
erase	Delete all configuration data from the system. Reset back to factory defaults.
idle	Specify the number of minutes the system will wait until going to idle. A value of 0 disables the idle timeout. The system will <u>not</u> go to idle when a cartridge is inserted. (**NOTE:** *Not available on all models*)
name <device name>	Stores a user provided name to be displayed on the touch screen default display.
reboot	Reboots the device.
fw	Prints GEMR-HS firmware version.

| quit	Exits the configuration daemon.
force_passthrough <1/0>	Forces the GEMR-HS to continuously be in passthrough mode even though reboots until the setting is reverted. 1 for enable, 0 to disable. (**NOTE**: *Not available on all models*)

Network Configuration Commands	
oob_port *<ipaddress> <subnet mask> <mtu>*	Sets the IP address of the admin port.
data_port_mtu *<mtu>*	Sets the MTU size for the data port. Recommended to configure at 9000 unless the client network adapter supports other sizes.

ⓘ *Always 'save' and 'reboot' after making configuration changes*

Normal Operation

Under normal operation, the GEMR-HS is used with minimum user interaction in the same manner as the GEM/GEMR. The user inserts a cartridge, waits for the cartridge to boot and then accesses the cartridge over the network interface. When complete, the user removes the cartridge.

The GEMR-HS screens can be used to provide additional user feedback to the EDTC status. When the cartridge is inserted the "CARTRIDGE BOOTING" message is displayed (*average boot time is 30-40 secs*). When the boot process completes the EDTC status screen is displayed:
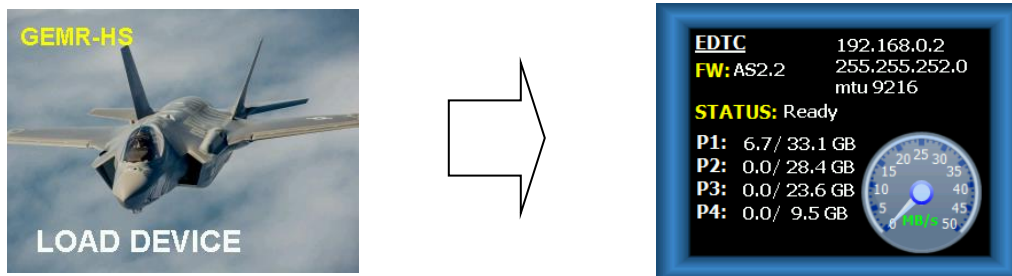
See "Screen Descriptions" for more information.

Passthrough Mode

The GEMR-HS Passthrough Mode is designed to support situations that require EDTC access using the legacy network interface. When the passthrough mode is activated the GEMR-HS reconfigures the electrical interface in the EDTC to be a GEMR interface. In this mode, the GEMR-HS provides an EDTC interface that is exactly the same as a GEMR. The passthrough screen displays the status of the EDTC boot process and the EDTC IP address after cartridge boot.
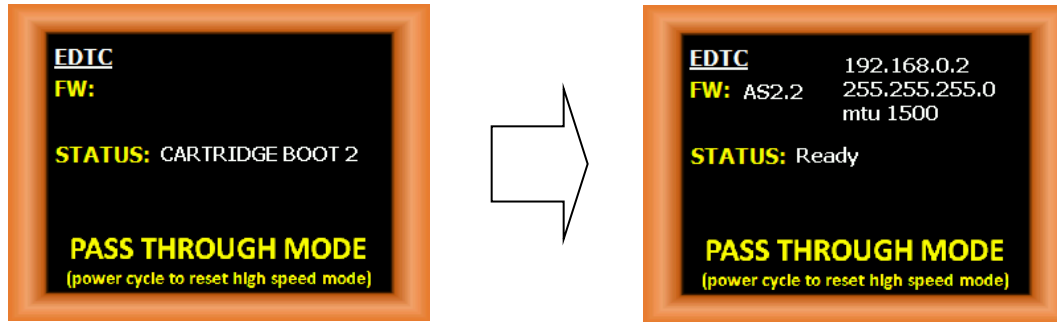
If using CIFS or the EDTC Web interface it will require passthrough mode to function properly.

Enter Passthrough Mode
1.) Remove cartridge if inserted.
2.) Press the 'Loading' screen.
3.) Press 'Activate Passthrough Mode'.
4.) The above screens will be displayed.
5.) Passthrough mode will remain active until the GEMR-HS is power cycled.
6.) Once Passthrough Mode is enabled, insert a cartridge.

Enter Passthrough Mode (*extended*)
(**NOTE:** *Not available on all models*)
Some scenarios it may be desired to continuously be in passthrough mode (*for example if always using CIF file sharing to perform transfers*). To keep passthrough enabled through power cycling use the **force_passthrough 1** from the *cfg* daemon. Reboot the device after configuration changes.

In this configuration the GEMR-HS will remain in passthrough mode until either **force_passthrough** is set to 0 or the device is reset to factory settings using the 'erase' CLI command.

Administrative Procedures

EDTC IP Reset

The legacy GEM/GEMR used a hardware process to reset the EDTC. The GEMR-HS requires to use the EDTC Web interface to reset the EDTC IP address.

1.) Insert EDTC into GEMR-HS.
2.) Reconfigure the client computer network interface to use a subnet compatible with the EDTC IP address displayed on the EDTC Status Screen.
3.) Access the EDTC Web interface using the IP address on the EDTC page.
4.) Use the EDTC Web interface to change the EDTC IP address.

NOTE: *The IP address displayed on the screen is only updated when the cartridge is first inserted and will not update if the user changes the EDTC IP via the EDTC Web interface. Remove and reinsert the cartridge to update.*

GEMR-HS IP Reset

If the GEMR-HS Admin Port network interface is misconfigured the following procedure can be used to reset the Admin port back to factory defaults.
1.) Power on GEMR-HS without a cartridge inserted.
2.) Once "LOAD CARTRIDGE" is displayed, touch the screen to switch to the Admin Screen.
3.) Select the "ADMIN" button to change screens to the Admin BIT screen.
4.) Select "ERASE GEMR-HS" button.
5.) Power cycle the GEMR-HS.
6.) Configure the Admin port using the standard GEMR-HS configuration process.
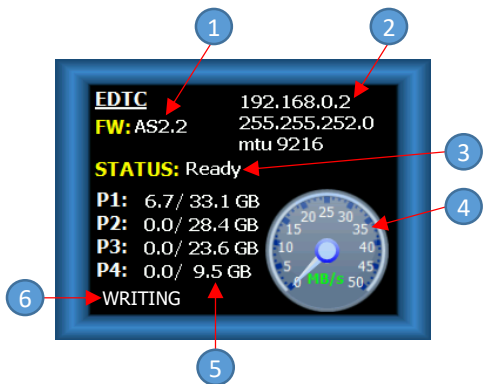
Screen Descriptions

Default Screen

	FIELD	DESCRIPTION
1	Name	Administratively configurable name field. Use the configuration tool to assign the GEMR-HS a name.
2	Status	Primary status message used for booting, cartridge loading and general notifications. On older models, when the device is in idle mode, the screen will display 'IDLE'. Simply press the touch screen to wake the device up.
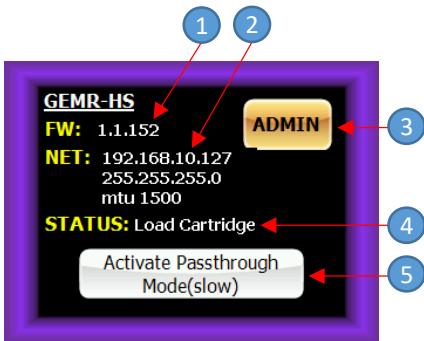
Admin Screen

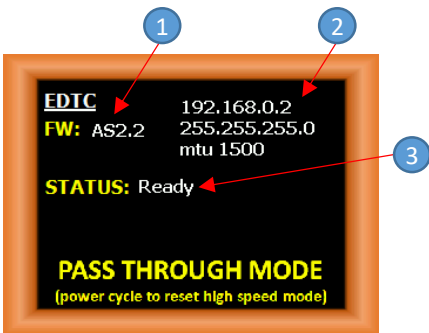|	FIELD	DESCRIPTION
1	GEMR-HS Firmware	Displays the firmware version of the embedded software running in the GEMR-HS.
2	Admin Port Network I/F	Displays the IP address, Netmask and MTU size of the GEMR-HS Admin port. Used for system configuration.
3	Admin Button	Button used to access Built in Test (BIT) administration screen.
4	GEMR-HS Status	Display the current state of the GEMR-HS.

5	Activate Pass Through	Button used to command the GEMR-HS into pass through mode.

### *EDTC Screen*

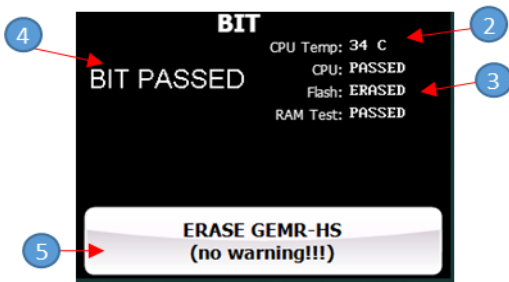|	FIELD	DESCRIPTION
1	EDTC Firmware	OFP ID of the inserted cartridge.
2	Data Port Network I/F	Displays the IP address, Netmask and MTU size of the GEMR-HS Data port. Used for data transfer to/from the EDTC. This network address is defined by the **EDTC network configuration web page**. The GEMR-HS can only control the MTU size which is configurable by the 'cfg' CLI.
3	EDTC Status	Status message of the EDTC. This field displays BUSY when data is being transferred. FORMATTING % when performing a low-level format. ZEROIZE % when performing an EDTC zeroize.
4	Transfer Rate	Displays the FTP transfer rate in megabytes (MBs) per second.
5	Partition Status	Displays the partition status of the four EDTC partitions. The status displays used/total gigabytes. If a partition is unformatted (*or corrupt*) a "0/0 GB" is displayed.
6	Transfer Status	Displays an FTP transfer status. Flashes READING when FTP reads are performed, WRITING when FTP writes are performed. (**NOTE:** *This is only updated when using FTP transfers.*)

Passthrough Screen

	FIELD	DESCRIPTION
1	EDTC Firmware	OFP ID of the inserted cartridge.
2	Data Port Network I/F	Displays the IP address, Netmask, and MTU size of the GEMR-HS Data port. Used for data transfer to/from the EDTC. This network address is defined by the **EDTC network configuration web page**. The IP address is only updated when the cartridge is first inserted and will not update if the user changes the EDTC IP via the EDTC Web interface.
3	EDTC Status	Status message of the EDTC. The field displays LOAD CARTRIDGE when no cartridge is present and BOOTING during cartridge boot.
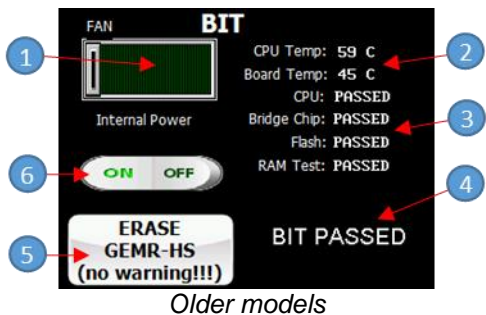
Older models   *Newer models*

Admin BIT Screen

	FIELD	DESCRIPTION
1	Fan Slider	Touch slider to test the fan speed controller. (*NOTE: Not available on all models*)
2	Temperature Status	System temperatures.
3	Individual BIT Status	Displays BIT status of each hardware component.

4	System BIT Status	Displays GEMR-HS BIT status.
5	ERASE Button	The Erase button deletes all system configuration data. This operation performs the same operation as the "erase" command in the configuration tool. After the system erase completes, the "Flash" bit status changes to ERASED.
6	Internal Power Toggle	Test internal power on/off state. Turning power off clears the BIT status. Turning power on executes BIT, updating BIT status. (***NOTE:*** *Not available on all models*)

Limitations

The GEMR-HS has the following design limitations

1.) EDTCs OFP versions older than AS2.2 will operate in pass through mode only
2.) Only one FTP session at a time is supported.
3.) The GEMR-HS data and admin ports must be connected to the same subnet as the client computer.
4.) Internet Protocol packets transmitted from the GEMR-HS have a Maximum Transmission Unit (MTU) size of 9000 bytes.
5.) Used partition activity status is only updated when transmitting or deleting files over FTP.
6.) The EDTC only supports active FTP transfers. It does not support passive mode.

Troubleshooting

This section provides troubleshooting tips for issues that may occur with the device.

1.) Removing the cartridge in the middle of a cartridge boot will require the GEMR-HS to be power cycled.

2.) Some web browser/OS combinations have difficulty displaying the EDTC web interface when JUMBO frames are enabled. Using passthrough mode allows the user to work around the issue. This is not a device issue.

3.) The EDTC CIFS interface works best in passthrough mode. The GEMR-HS only accelerates FTP data transfers.

4.) Terminating an FTP session in the middle of a file write will leave the file corrupted and require a cartridge reset (open and close handle).

5.) Terminating an FTP session in the middle of a file read will require a cartridge reset (open and close handle).

6.) If large file transfers fail, check JUMBO frames on the local system. Some systems do not support JUMBO frames. If the GEMR-HS is configured with MTU higher than 1500, large file transfers may fail if the client system is not also configured. To resolve the issue set the GEMR-HS MTU size to 1500. See the cfg commands to update MTU on the GEMR-HS. Remember JUMBO frames is not supported when using CIFS.

7.) If the system is having unknown issues, a detailed log file will be required for analysis. A detailed system log is captured using telnet via the GEMR-HS admin port, perform the operation that causes the issue, the system will log all events to the telnet session. Copy the session log to a text file and attach the file to a Ticket created in ITI's Ticket Center (https://itiengineering.com/support).