



Models:

KL01H-M – HSL Key Loader for Neous Encrypted Isolators

HLT39510 Rev. 1.0

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INTRODUCTION

High Sec Labs' KL01H-M Key Loader generates unique NIST-certified HID encryption keys and loads them to the Encrypted Isolators that are paired with Neous Transmitters and Receivers. This method allows a pair of Isolators to share an encryption key without displaying the key to the operator.

This manual demonstrates how to install and operate the KL01H-M Key Loader.

Keyboard Hotkeys

The interface to operate the Key Loader uses keyboard hotkeys that can be entered at any time. These hotkeys are based on a QWERTY keyboard layout. For example, to put an Isolator into Receive Mode, the key combination is two presses of the **Left** Control (**LCtrl**) key and one press of the **r** key, so the combination is shown as **LCtrl | LCtrl | r**.

Notes:

- Always use the Left Control key (**LCtrl**) unless otherwise specified.
- Do not use the numeric pad for number keys, unless otherwise specified.
- All hotkey combinations are configured using a QWERTY keyboard. When using a non-QWERTY keyboard, use the key location corresponding to the QWERTY layout.

INTRODUCTION

Specifications

Model Number	KL01H-M
Host/PC Connectivity	
Video	1xDP/HDMI (IN)
Keyboard/Mouse	1xUSB Type B
Console Connectivity	
Video	1xDP/HDMI (OUT)
Keyboard/Mouse	2xUSB Type A
Physical	
Dimensions	145x105x28 mm / 5.8x4.2x1.1 in
Weight	0.3 kg / 0.64 lbs.
Power	
Power Requirements	DC input 12V/1.5A Maximum
AC Input	External power supply unit, 90V-240V AC
Environmental	
Operating Temperature	0°C to 40°C / 32°F to 104°F
Storage Temperature	-20°C to 60°C / -4°F to 140°F
Humidity	0%-80% RH, non-condensing
General Info	
Manufacturing	TAA/BAA Compliant
Product Lifecycle	10 Years
Product Warranty	2 Years

INSTALLATION AND OPERATION

Before Installation

Before opening the product's sealed packaging, inspect the seal's condition to verify that the product was not accessed or tampered with during delivery. If the packaging seal looks suspicious, contact HSL support and do not use the product.

Tamper-Evident Label

- The Key Loader uses a holographic tamper-evident label to provide visual indications in case of enclosure intrusion attempts. These labels display white dots or the text "VOID" once removed. When opening the product's packaging, inspect the tamper-evident label.
- Once the Key Loader is removed from its packaging materials, carefully inspect the tamper-evident label to verify that the product is properly sealed. If the label is damaged or missing, contact HSL support and do not use the product..



Figure 1: HSL Holographic Tamper-Evident Label

Package Contents

Once the packaging for the Key Loader is opened, inspect the contents of the package to make sure all components are included.

KL01H-M	CPN3932S	Key Loader for Neous Encrypted Isolators	1
		Wall-Mounted 12V DC Power Source	1
		HDMI Retention Kit	1

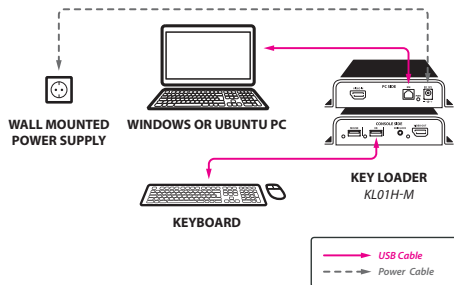
Required Equipment

- Key Loader
- FI11PHT-ME Transmitter Encrypted HID Isolator
- FI11PHR-ME Receiver Encrypted HID Isolator
- PC with Windows or Ubuntu
- USB cable to connect the PC to the KM port of the Key Loader.
- HDMI cable to temporarily connect the Key Loader to the Isolator.
- Keyboard connected to the Key Loader KB interface.
- Mouse when required for normal PC operation. A separate keyboard/mouse may be required when using a desktop PC.

INSTALLATION AND OPERATION

Connect the Key Loader to the PC and Keyboard

1. Connect the Key Loader to a 12V DC power supply.
2. Connect the Key Loader to the Windows or Ubuntu PC via the USB-B port labeled 'KM' on the Key Loader's PC Side.
3. Connect the keyboard to the USB-A port labeled 'KB' on the Key Loader's Console Side.

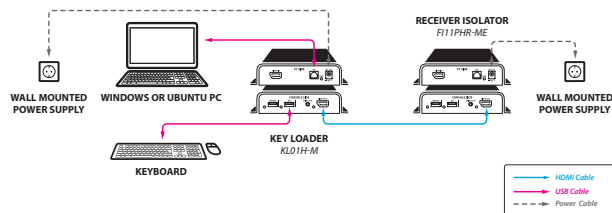


Provision the Receiver (Rx) Isolator

Step 1 – Connect the Key Loader to the Rx Isolator

1. Connect the Rx Isolator to a 12V DC power supply.
2. Connect one end of the HDMI cable to DP/HDMI port labeled 'VIDEO OUT' on the Key Loader's Console Side.
3. Connect the other end of the HDMI cable to the DP/HDMI port labeled 'VIDEO OUT' on the Rx Isolator.

Note: It is important to connect the Video ports 'VIDEO OUT' to 'VIDEO OUT' for the key provisioning process to work.



INSTALLATION AND OPERATION

Step 2 – Put the Rx Isolator into Key Receive Mode

1. On the PC, open Notepad (Windows) or Text Editor (Ubuntu). This will act as the text interface for the Key Loader.
2. On the keyboard connected to the Key Loader, enter the key combination **LCtrl | LCtrl | r** to put the Rx Isolator into Key Receive Mode. This allows the Rx Isolator to receive a new encryption key
3. The open text editor will display one of the following responses:

Response	Meaning	Required action
OK	The Rx Isolator is in Key Receive Mode.	Continue to the next step.
NACK	The action did not succeed.	Do not continue. Check that the HDMI cable between the Key Loader's VIDEO OUT and the Tx Isolator's VIDEO IN is correctly and securely connected, then repeat the command.

Step 3 – Power-Cycle the Rx Isolator

Note: Perform this step only after the text editor displays the “OK” response.

1. Disconnect any HDMI cable connected to the Rx Isolator's VIDEO IN port.
2. Disconnect power from the Rx Isolator.
3. Reconnect power to the Rx Isolator.
4. Allow the Rx Isolator to complete its power-up sequence.

IMPORTANT: DO NOT disconnect the cable connecting the Key Loader's VIDEO OUT port to the Rx Isolator's VIDEO OUT port at this stage.

INSTALLATION AND OPERATION

Step 4 – Generate a New Encryption Key

1. Ensure the text editor is active on the PC.
2. Using the keyboard connected to the Key Loader, enter **LCtrl | LCtrl | n** to generate a new encryption key internally on the Key Loader.

Expected result: The text editor displays “OK” to indicate the new key is generated. Do not proceed unless the expected success response is received.

Notes:

- The encryption key is never displayed to the operator. Do not attempt to expose, copy, or manually enter an encryption key.
- The Key Loader generates completely random encryption keys and only stores the most recent one. Once a new key is generated, any key generated previously is lost.

Step 5 – e. Load the New Encryption Key to the Rx Isolator

1. Using the keyboard connected to the Key Loader, enter **LCtrl | LCtrl | p | 1** to load the newly generated key onto the Rx Isolator.

Expected result: The text editor displays “OK” to indicate the key has been loaded. Do not proceed unless the expected success response is received.

Alternate Step: Load the Original Firmware Default Key

When the service procedure requires the original firmware default key, enter **LCtrl | LCtrl | p | 0** to reset the Rx Isolator.

IMPORTANT: Enter **LCtrl | LCtrl | p | 1** to load a newly generated key. Only enter **LCtrl | LCtrl | p | 0** when the intention is to restore the default key supplied with the original TX/RX firmware.

Step 6 – Reboot the Rx Isolator and Restore Normal Connections

1. After confirming the key has successfully loaded onto the Rx Isolator, perform a power cycle on the Isolator.
2. Disconnect the HDMI cable connecting the Key Loader’s VIDEO OUT port to the Rx Isolator’s VIDEO OUT port.
3. Connect the Rx Isolator in its normal operating configuration.
4. Allow the Rx Isolator to complete its power-up sequence.

IMPORTANT: DO NOT GENERATE A NEW KEY BEYOND THIS POINT

At this point, only the Rx Isolator has the new key. If a new key is generated on the Key Loader, Tx Isolators will not be able to communicate with this Rx Isolator for encrypted HID.

INSTALLATION AND OPERATION

Provision the Transmitter (Tx) Isolator

Step 1 – Connect the Key Loader to the Tx Isolator

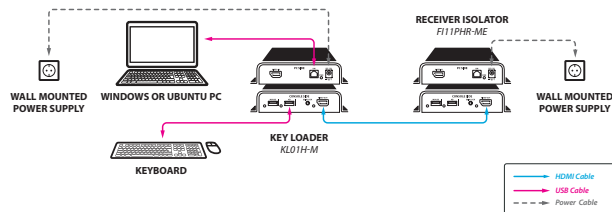
1. Move the Key Loader to the corresponding Tx Isolator.

Note: The Key Loader retains the last generated key, so it can disconnect from the power source without losing the key.

2. If necessary, reconnect the Key Loader to the PC via the 'KM' port on the Key Loader's PC Side and reconnect the keyboard via the 'KB' port on the Key Loader's Console Side.

Step 2 – Connect the Key Loader to the Tx Isolator

1. Open the text editor on the PC and ensure it is active.
2. Connect one end of the HDMI cable to DP/HDMI port labeled 'VIDEO OUT' on the Key Loader's Console Side.
3. Connect the other end of the HDMI cable to the DP/HDMI port labeled 'VIDEO IN' on the Rx Isolator.



INSTALLATION AND OPERATION

Step 3 – Put the Tx Isolator into Key Receive Mode

1. On the PC, open Notepad (Windows) or Text Editor (Ubuntu). This will act as the text interface for the Key Loader.
2. On the keyboard connected to the Key Loader, enter the key combination **LCtrl | LCtrl | r** to put the Tx Isolator into Key Receive Mode. This allows the Rx Isolator to receive a new encryption key
3. The open text editor will display one of the following responses:

Response	Meaning	Required action
OK	The Tx Isolator is in Key Receive Mode.	Continue to the next step.
NACK	The action did not succeed.	Do not continue. Check that the HDMI cable between the Key Loader's VIDEO OUT and the Tx Isolator's VIDEO IN is correctly and securely connected, then repeat the command.

Step 4 – Power-Cycle the Tx Isolator

Note: Perform this step only after the text editor displays the “OK” response.

1. Disconnect power from the Tx Isolator.
2. Reconnect power to the Tx Isolator.
3. Allow the Tx Isolator to complete its power-up sequence.

IMPORTANT: DO NOT disconnect the cable connecting the Key Loader's VIDEO OUT port to the Tx Isolator's VIDEO IN port at this stage.

Step 5 – Load the Stored Encryption Key to the Tx Isolator

1. Using the keyboard connected to the Key Loader, enter **LCtrl | LCtrl | p | 1** to load the stored encryption key onto the Tx Isolator.

Expected result: The text editor displays “OK” to indicate the key has been loaded. Do not proceed unless the expected success response is received.

Step 6 – Reboot the Tx Isolator and Restore Normal Connections

1. After confirming the key has successfully loaded onto the Tx Isolator, perform a power cycle on the Isolator.
2. Disconnect the HDMI cable connecting the Key Loader's VIDEO OUT port to the Tx Isolator's VIDEO IN port.
3. Connect the Tx Isolator in its normal operating configuration.
4. Allow the Tx Isolator to complete its power-up sequence.

Final Verification

Once the provisioning process is complete, the Tx and Rx Isolators contain the same newly generated encryption key. Confirm the system is operating correctly, with HID communication resuming between the Transmitter and Receiver.

IMPORTANT: Do not consider the system successfully provisioned until confirming normal HID operation.

APPENDIX

Troubleshooting

The following table shows some possible problems that may occur, their likely cause, and how to resolve them.

Problem	Likely Cause(s)	Solution
Receive the “NACK” error message after attempting to put the Rx Isolator into Key Receive Mode.	The Rx Isolator did not successfully enter Key Receive Mode.	Do not continue. Check that the HDMI cable between the Key Loader’s VIDEO OUT and the Tx Isolator’s VIDEO IN is correctly and securely connected, then repeat the command.
Receive the “NACK” error message after attempting to put the Tx Isolator into Key Receive Mode.	The Tx Isolator did not successfully enter Key Receive Mode.	Do not continue. Check that the HDMI cable between the Key Loader’s VIDEO OUT and the Tx Isolator’s VIDEO IN is correctly and securely connected, then repeat the command.
HID between the Tx and Rx Isolators does not operate after only provisioning the Rx Isolator.	The Tx Isolator will not match the Rx Isolator without the same encryption key; this is expected behavior.	Provision the Tx Isolator with the same encryption key.

Problem	Likely Cause(s)	Solution
HID between the Tx and Rx Isolators does not operate after provisioning both Isolators.	- There may be an issue with cabling. - The provisioning process may be incomplete, or there may have been a new key generated between provisioning the Tx and Rx Isolators, causing them to have mismatched keys.	Cabling Issue: Check that the connections to the Tx and Rx Isolators are correct. Provisioning Issue: Confirm both provisioning operations returned with the “OK” message. Repeat the provisioning procedure so both Isolators receive the same key.

Highseclabs.com

For more information about HSL's solutions, please contact:

HighSecLabs Inc.

905 James Record Road STE A,
Huntsville AL, 35824

HSL Support

256-203-3036
<https://highseclabs.com/contact/>

Sales

Sales@highseclabs.com

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