THE WORLD'S FIRST
AUDIO DIODE

Prevents leakage through
AUDIO peripherals

HDC19354 Rev C

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THE THREATS
OF USING AUDIO PERIPHERALS

Peripheral audio devices such as headphones, speakers, and microphones can be easily hacked and transformed into a listening device, through which attackers can:
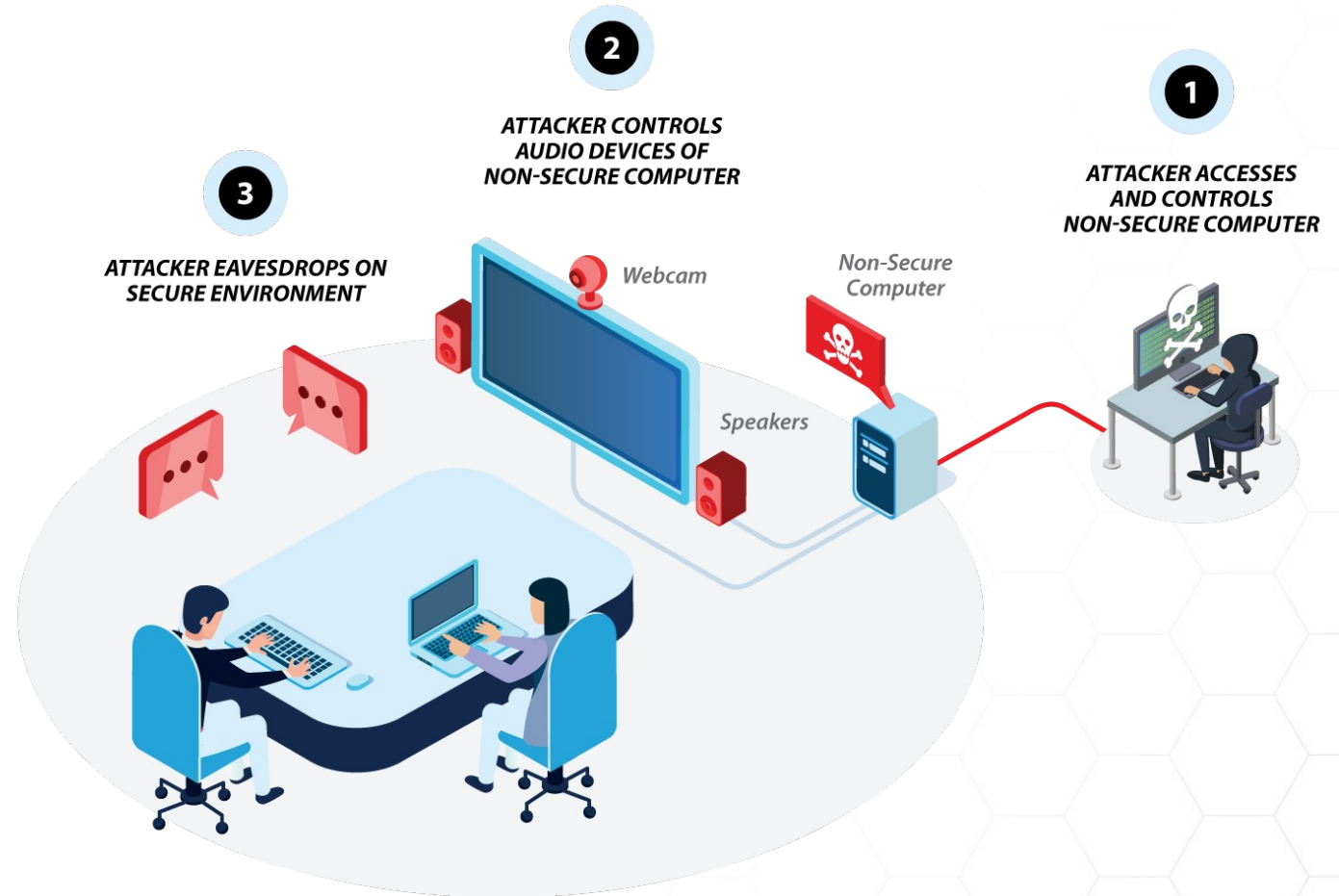
- Listen in to surrounding classified conversations in secure rooms
- Transfer data from secured to unsecured networks

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LEAKAGE OF A SECURE CONVERSATION

**Eavesdropping through an unsecured network's audio devices**

- Any speaker can be easily converted to a microphone by an attacker's malicious software

- With proper audio driver modifications, this small signal can be amplified and filtered to pick up surrounding conversations.

2

ATTACKER CONTROLS AUDIO DEVICES OF NON-SECURE COMPUTER

1

ATTACKER ACCESSES AND CONTROLS NON-SECURE COMPUTER

3

ATTACKER EAVESDROPS ON SECURE ENVIRONMENT

Webcam

Non-Secure Computer

Speakers

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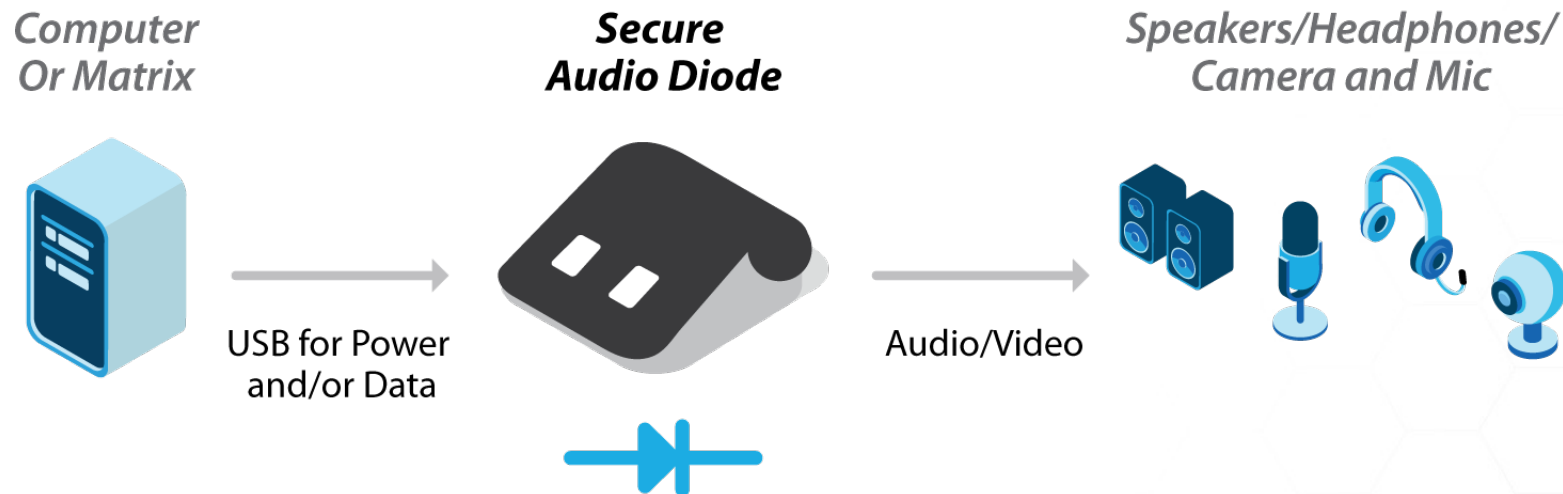Highest Security Solutions

LEAKAGE OF SECURE DATA

Implanting or capturing data from a PC

- Attackers can transfer data from secured to unsecured networks by broadcasting high-frequency signals using the secure computer's audio peripherals.

- For example, data leakage through acoustic ultrasonic transmission

Secure Network → Secure Computer))) Non-Secure Computer → Unsecured Network
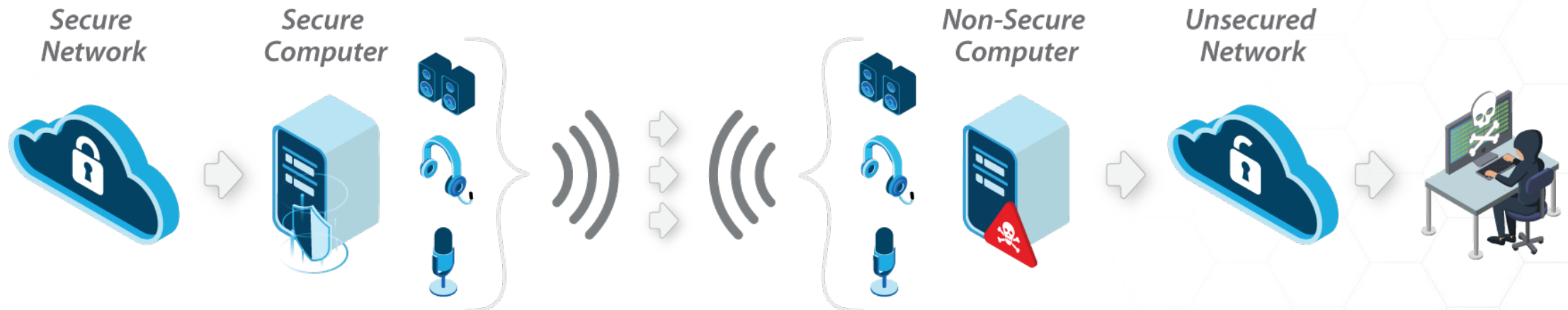
HSL'S **AUDIO DIODE** FAMILY

- The Audio Diode mitigates the risks of using peripheral audio devices in organizations with multiple isolated networks.

- The device connects between a source PC and a peripheral audio device (speaker/headphone or microphone/camera) and prevents attackers from exploiting audio data-leakage vulnerabilities.

Computer Or Matrix — USB for Power and/or Data → Secure Audio Diode → Audio/Video → Speakers/Headphones/ Camera and Mic

HOW DOES IT **WORK**?

- **Unidirectional Audio Flow**
  HSL's Audio Diodes enforce unidirectional audio flow from source to destination (speaker) preventing eavesdropping by a remote attacker.

- **Low-Pass Filter**
  All sounds passing through the Audio Diode go through a low-pass filter that restricts the audio frequencies to the range compatible with the human ear. High frequency data transmissions are blocked.

- **Push-Button Control**
  Push buttons activate the speaker/headphone and microphone/camera manually. Certain models enable setting when and for how long to activate the media channel

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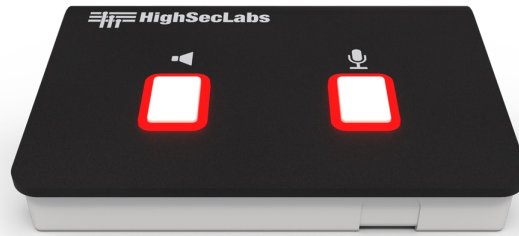
MODELS WITH **BUTTONS**

The Audio Diode has push buttons (one - Audio, or two - Audio and Mic/Camera) that allow basic control of the diode:

1. By default audio peripherals are **disabled** and buttons are illuminated **green**.
2. A short double press on a closed interface will open it for several minutes.
   Solid **red** light indicates a non-secure/open diode state.
3. A short double press closes an open interface.
   Solid **green** light indicates a secure/closed diode state.
4. About a minute before turning off the Speakers/Mic, the button light will start flickering **red**, indicating it's about to turn off.
5. A long press on an open interface will extend it for a few minutes more.
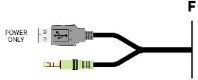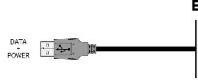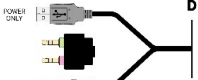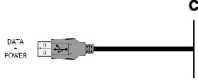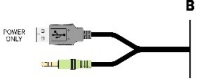
1 – Secure/Safe to Talk
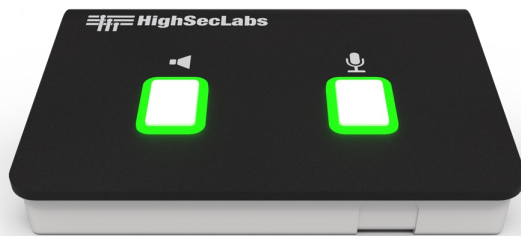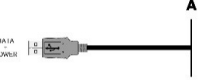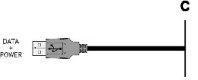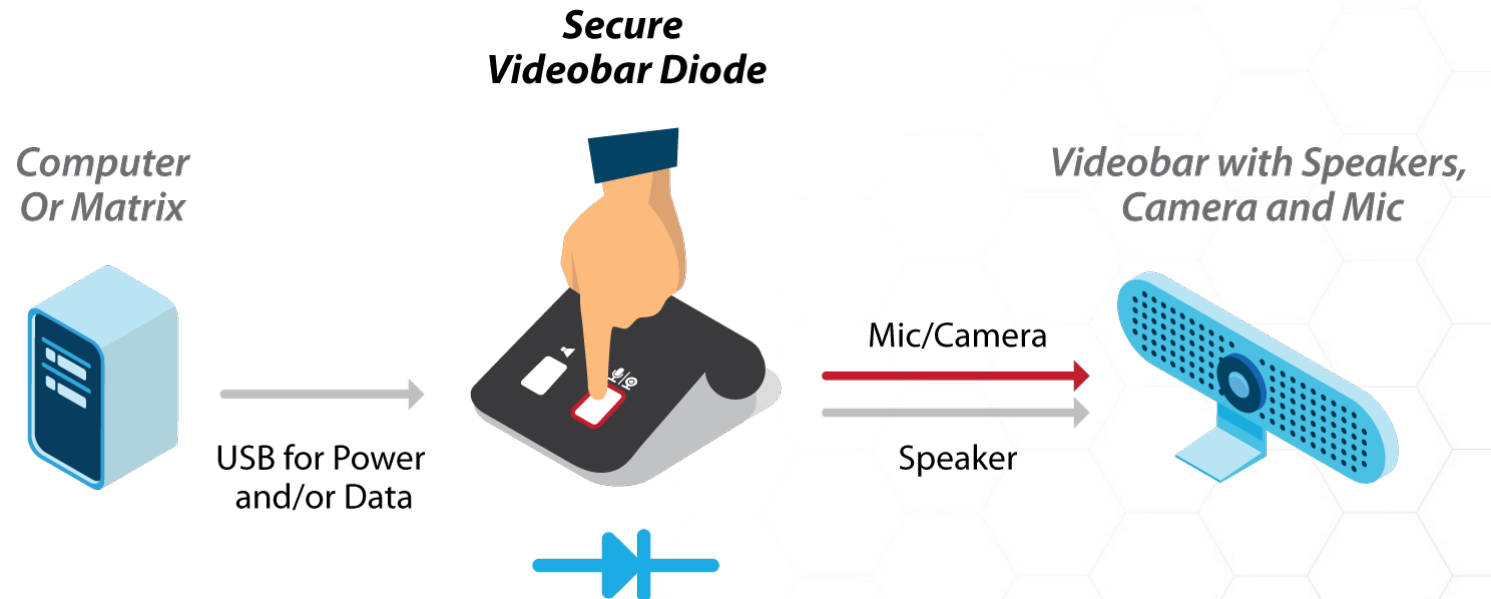

2 – Not Secure/Speaker & Mic Open

4 - About to Close

PRODUCT TABLE

Model	FA10AO-4	FA10BO-4	FA10AM-4	FA10BM-4	FA10A-4	FA10B-4	FA10BC-4	FS11USB2	FA10BB-4
Description	Analog to analog always open no mic, no anti-tamper (AT)	USB to analog always open no mic, no AT	Analog to analog with mic support	USB to analog with mic support	Analog to analog no mic support	USB to analog no mic support	USB to analog with mic & digital camera support	Videobar diode, USB to USB with digital audio (speakers and mic) & video support	USB to USB with mic and headset support
Host Cable								USB	USB
Input Interface	Analog	USB	Analog	USB	Analog	USB	USB	USB	USB
Output Interface	Analog	Analog	Analog	Analog	Analog	Analog	Analog	USB	USB
Speaker Button	-	-	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Mic Button	-	-	Yes	Yes	-	-	Yes	Yes (with camera)	Yes
Camera	-	-	-	-	-	-	Yes	Yes	-

VIDEOBAR/SOUNDBAR
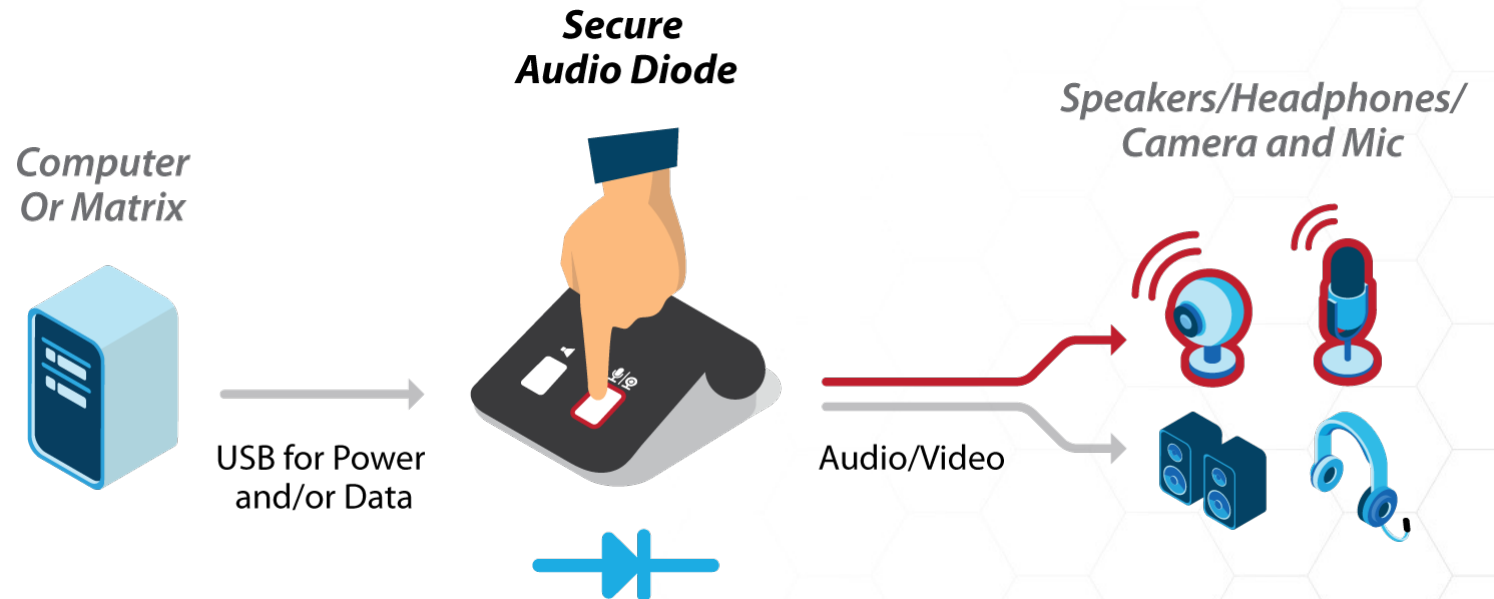# SECURE DIODE - **FS11USB2**

- Securely enables camera session with microphone and audio for a limited, user-defined timeframe after the Camera/Mic and Audio buttons are pressed

- Microphone/camera and speakers can be controlled individually

- Enforces unidirectional data flow of media streams, preventing data leaks

- Audio stream passes through a low pass filter preventing data leaks through high frequency transmissions

*Secure
Videobar Diode*

*Computer
Or Matrix*

*Videobar with Speakers,
Camera and Mic*

USB for Power
and/or Data

Mic/Camera

Speaker

AUDIO DIODE MODELS – FA10BC-4

WEB CAMERA SUPPORT SECURE AUDIO DIODE - FA10BC-4

- Securely enables camera session with microphone and audio for a limited timeframe when the Camera/Mic button is pressed

- Separately open/close audio session with a speaker button

Computer
Or Matrix

Secure
Audio Diode

Speakers/Headphones/
Camera and Mic

USB for Power
and/or Data

Audio/Video

AUDIO DIODE MODELS

FA10AM-4

FA10A-4

FA10AO-4

FA10BM-4

FA10B-4

FA10BO-4

FA10BB-4

FA10BC-4

FS11USB2

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HIGHLIGHTS SUMMARY

Feature	Benefit
Audio Diode	Blocks listening in to surrounding conversations
Low-Pass Filter	Blocks high-frequency signal attacks
Small Size	Takes up almost no room on the desktop
Easy to Install and Operate	Quickly connects to the host PC
Push Button Control	User clicks on the push button(s) to activate media stream(s)
Configuration Tool	Sets how long the speaker or mic/camera remains open
Independent Speaker and Mic/Camera Support	The user decides which peripheral device to use and when

Thank You

For more info:

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