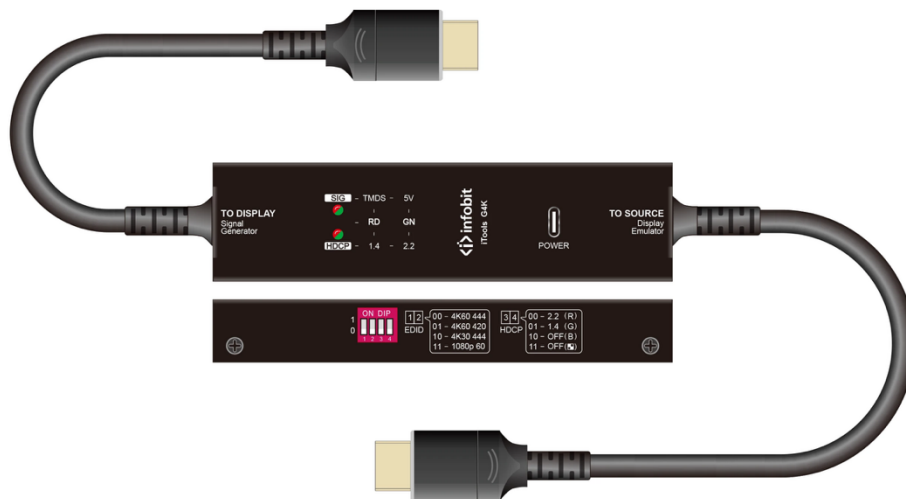


# iTools G4K

HDMI 4K60 Signal Generator & Display Emulator

*User Manual V1.0*



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# 1. TECHNOLOGY INTRODUCTION

## 1.1 WHAT IS HDMI SIGNAL GENERATOR AND EMULATOR?

An **HDMI 4K signal generator and analyzer** is an essential diagnostic tool used by AV installers, integrators, and technicians to troubleshoot and verify HDMI signal paths. It acts as a "source" to send test patterns to displays, and a "sink" (display emulator) to inspect incoming signals from video sources like media players or laptops.

## 1.2 CORE DIAGNOSTIC CAPABILITIES

- **Signal Generation (Source Mode):** Transmits reference video patterns and audio tones to test if TVs, projectors, or extenders can handle specific resolutions, frame rates, and color spaces.
- **Signal Analysis (Sink/Emulator Mode):** Mimics a display to check the incoming raw data from a source device. It reads critical data like resolution, refresh rate, color depth, and frame rates.
- **EDID Management:** Reads, copies, and emulates Extended Display Identification Data (EDID) to solve handshake and communication issues between conflicting devices.
- **HDCP Verification:** Tests compliance for HDCP 1.4 and HDCP 2.2 encryption protocol layers to diagnose "black screen" copyright protection issues.

## 1.3 WHO NEEDS THIS TOOL?

- **AV Integrators & Installers:** Professionals setting up commercial conference rooms, sports bars, classrooms, or high-end home theaters.
- **Broadcast & Live Event Technicians:** Crews managing massive LED video walls, concert screens, and complex production switchers where a signal failure drops the entire show.
- **Hardware QA & Product Developers:** Engineers designing new TVs, media players, AV receivers, or HDMI cables who need to stress-test their hardware against strict video standards.
- **Smart Home System Programmers:** Specialists deploying automated multi-room video distribution systems (like HDBaseT or AV-over-IP matrices).



- **IT Field Support Teams:** Corporate tech teams managing large offices with extensive digital signage networks and complex hybrid meeting rooms.

## 1.4 WHY DO THEY NEED IT?

< The Top 5 Problems It Solves >

### 1.4.1 IT ELIMINATES THE "BLAME GAME"

When a TV screen stays black, the display manufacturer blames the cable, the cable company blames the media player, and the media player company blames the AV receiver.

- **The Fix:** This tool acts as a referee. By injecting a perfect 4K signal directly into the cable or display, it proves exactly which piece of hardware in the chain is broken.

### 1.4.2 IT TESTS EQUIPMENT BEFORE IT IS INSTALLED

Installing hundreds of feet of HDMI or network cabling inside walls or ceilings is incredibly labor-intensive.

- **The Fix:** Technicians use the generator to test cables and extenders on a test bench *before* pulling them through drywall, saving thousands of dollars in wasted labor.

### 1.4.3 IT SOLVES INVISIBLE "HANDSHAKE" ERRORS

#### (EDID)

When a source (like a laptop) connects to a display (like a projector), they must talk to each other to agree on a resolution. If this conversation fails, you get a black screen, flickering video, or downgraded 1080p resolution.

- **The Fix:** The analyzer reads the display's hidden data profile (EDID) instantly, showing the technician exactly what resolutions the display is capable of accepting.



## 1.4.4 IT BYPASSES COPYRIGHT PROTECTION ISSUES (HDCP)

Premium content from Netflix, Apple TV, or Blu-ray players is encrypted using HDCP. If any device in your AV system uses an outdated encryption standard, the entire video stream shuts down.

- **The Fix:** The analyzer acts as a fake display to see if the source is outputting the correct HDCP 1.4 or 2.2 encryption, pointing out the exact device causing the security block.

## 1.4.5 IT CALIBRATES DISPLAYS FOR PERFECT COLOR

High-end commercial displays and home theaters require precise color calibration to combat room lighting and panel age.

- **The Fix:** The generator outputs standardized, mathematically perfect color bars and grayscale patterns so calibrators can tune the TV's brightness, contrast, and color accuracy accurately.

# 2. PRODUCT INTRODUCTION

The **iTools G4K** is a portable HDMI signal generator and display simulator, integrating both functions into a compact body. It is ideal for audio/video installers or testers. As a signal generator, user can use it to generate a signal via a 4-pin DIP switch. And as a display simulator, users can use it to analyze the signal status (5V, TMDS) and HDCP status via the device's LEDs. Flexible switching between HDMI male and female connectors for great convenience.

# 3. FEATURES

- Used as HDMI signal generator or display emulator (signal analyzer).
- Provides 4-pin DIP switch for setting video resolution and HDCP.
- Supports 4K@60Hz 4:4:4, 4K@60Hz 4:2:0, 4K@30Hz 4:4:4, or 1080p@60Hz video signal output.
- Supports HDCP OFF, HDCP 1.4 or HDCP 2.2 output.
- Supports four different test patterns for HDCP version.
- LEDs show signal and HDCP status.
- Powered via USB-C.
- Flexible switching between HDMI male and female connectors.

## 4. PACKAGE LIST

- 1x iTools G4K
- 2x HDMI Female-to-Female adapter
- 1x USB-C Power Cable (Data+power), 1m
- 1x Pouch
- 2x Dust Cap
- 1x User Manual

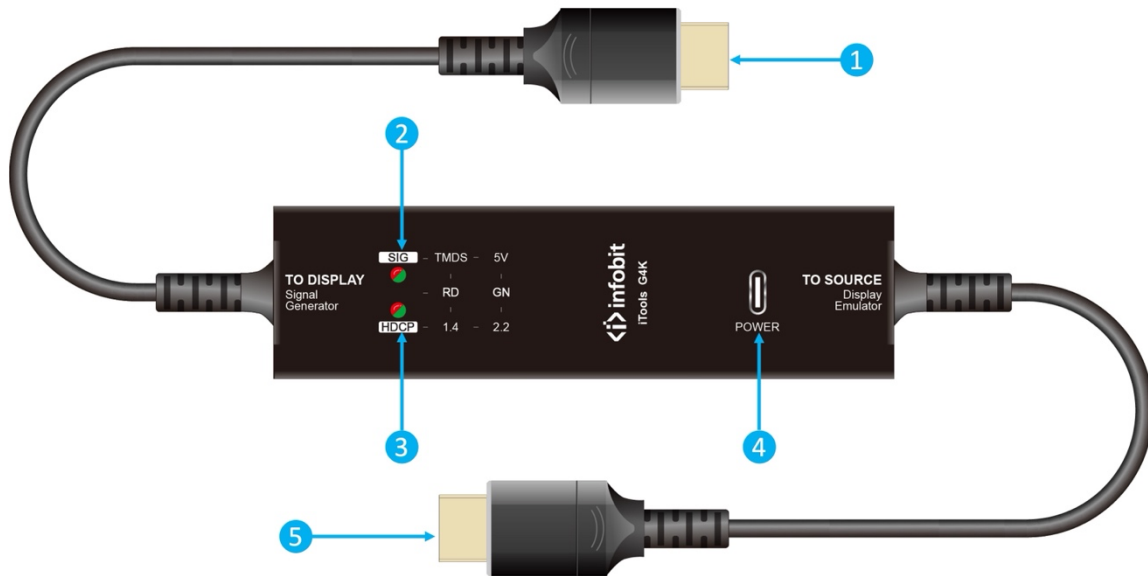
**Note:** Please contact your distributor immediately if any damage or defect in the components is found.

## 5. SPECIFICATION

<b>Input</b>	
Resolution	Up to 4K@60Hz 4:4:4 8-bit
<b>Output</b>	
Resolution	4K@60Hz 4:4:4, 4K@60Hz 4:2:0, 4K@30Hz 4:4:4, and 1080p@60Hz
<b>General</b>	
HDMI Version	HDMI 2.0
HDCP Version	2.2/1.4
Power Supply	DC 5V 1A
Power Consumption	1W (Max)
Storage Temperature	-20°C ~ +70°C
Relative Humidity	10% ~ 90%
Dimension (L*W*H)	430 x 36 x 22mm (including pigtail cables)
Net Weight	100g

## 6. PANEL DESCRIPTION

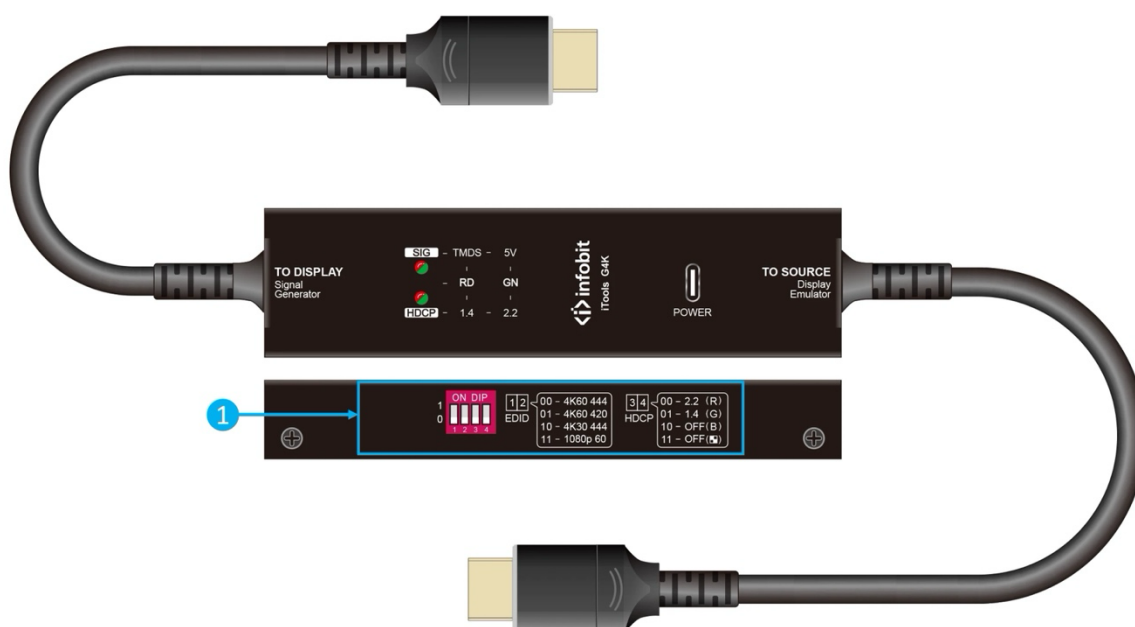
### 6.1 FRONT PANEL



No.	Name	Description
1	HDMI OUT	1x HDMI type-A male, HDMI 2.0, connect to the HDMI sink.
2	SIG	<p>1x red/green LED, signal indicator.</p> <ul style="list-style-type: none"> <li>When the device is used as a Signal Generator: it will turn red if the third-party device is detected there is an HDMI signal output. And turn green if only the DC 5V power supply.</li> <li>When the device is used as a Display Emulator: it will turn red if the TMDS signal is detected. And turn green if only the HDMI 5V signal is detected.</li> </ul>
3	HDCP	<p>1x red/green LED, HDCP indicator.</p> <ul style="list-style-type: none"> <li>When the device is used as a Signal Generator: it will turn red if there is an HDCP 2.2 signal output. It will turn green if there is an HDCP 1.4 signal output.</li> <li>When the device is used as a Display Emulator: it will turn red if the HDCP 2.2 signal is detected. It will turn green if the HDCP 1.4 signal is detected.</li> </ul>

4	POWER	1x USB-C, for power supply, DC 5V 1A. <b>Note:</b> When used as a Display Emulator, it can be powered via HDMI 5V. If the HDMI 5V power supply is insufficient, please power it via USB-C.
5	HDMI IN	1x HDMI type-A male, HDMI 2.0, connect to the HDMI source.

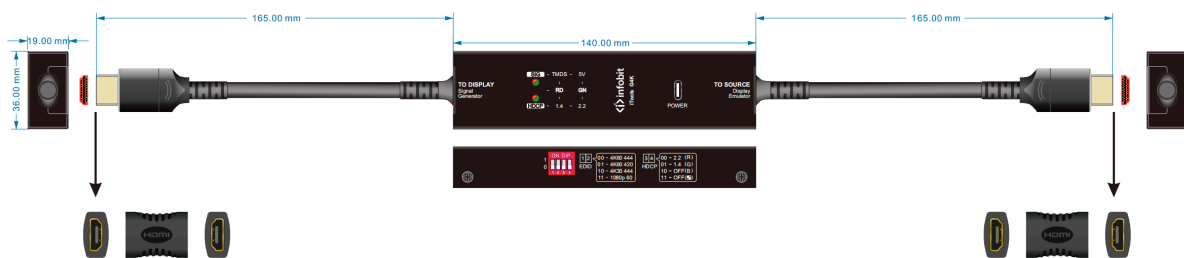
## 6.2 REAR PANEL



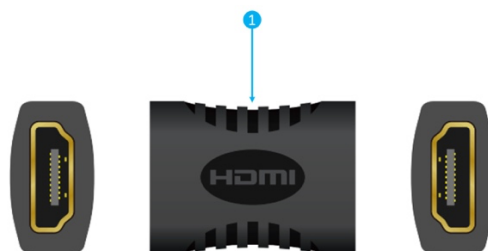
No.	Name	Description
1	4-position DIP Switch	When the device is used as a Signal Generator, 1 and 2 for EDID, 3 and 4 for HDCP. EDID: <ul style="list-style-type: none"> <li>● 00: 4K60 4:4:4 Audio 2CH PCM</li> <li>● 01: 4K60 4:2:0 Audio 2CH PCM</li> <li>● 10: 4K30 4:4:4 Audio 2CH PCM</li> <li>● 11: 1080p 60 Audio 2CH PCM</li> </ul>

		<p>HDCP:</p> <ul style="list-style-type: none"> <li>● 00: HDCP 2.2 Red screen</li> <li>● 01: HDCP 1.4 Green screen</li> <li>● 10: HDCP OFF Blue screen</li> <li>● 11: HDCP OFF AlternateWB</li> </ul>
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## 6.3 PANEL DRAWING



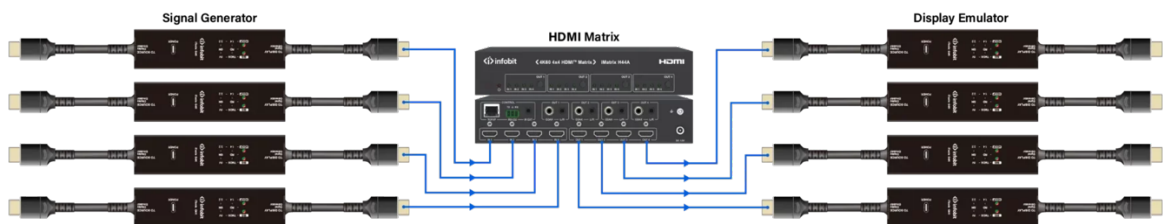
## 6.4 ACCESSORY



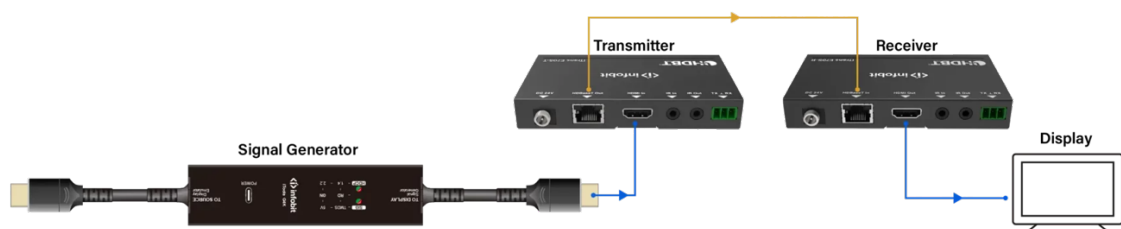
No.	Name &Description	Remark
1	ADAPTER	2x HDMI female-to-female adapters.

## 7. SYSTEM DIAGRAM

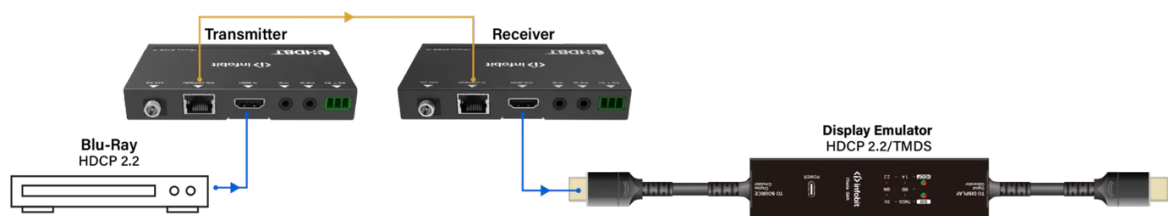
### 7.1 TO TEST HDMI MATRIX



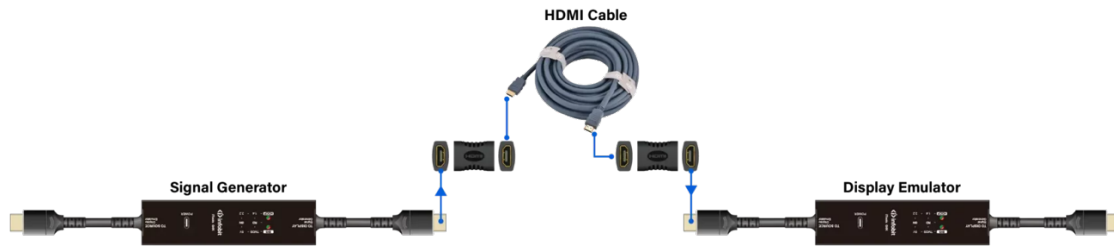
### 7.2 TO TEST HDBASET TRANSMITTER



### 7.3 TO TEST HDBASET RECEIVER



### 7.4 TO TEST CABLES



## 8. CUSTOMER SERVICE

The return of a product to our Customer Service implies the full agreement of the terms and conditions hereinafter. These terms and conditions may be changed without prior notice.

### 1) Warranty

The limited warranty period of the product is fixed three years.

### 2) Scope

These terms and conditions of Customer Service apply to the customer service provided for the products or any other items sold by authorized distributor only.

### 3) Warranty Exclusions:

- Factory applied serial number has been altered or removed from the product.
- Damage, deterioration or malfunction caused by:
  - Normal wear and tear.
  - Use of supplies or parts not meeting our specifications.
  - No certificate or invoice as the proof of warranty.
- The product model showed on the warranty card does not match with the model of the product for repairing or had been altered.
- Damage caused by force majeure.
- Servicing not authorized by distributor.
- Any other causes which do not relate to a product defect.

### 4) Documentation:

Customer Service will accept defective product(s) in the scope of warranty coverage at the sole condition that the defect has been clearly defined, and upon reception of the documents or copy of invoice, indicating the date of purchase, the type of product, the serial number, and the name of distributor.

**Note:** For further assistance or solutions, please contact your local distributor.