

Joystick Override GPI Input interface for Blackmagic Design Videohub Routers

Model **JOyVerride 20i-BMD**



General product description

The JOyVerride 20i-BMD is an interface designed to provide a “Joystick Override” video switching mode, on systems that are using Blackmagic Design¹ Videohub router series for camera color matching & technical control.

The joystick override mode allows the camera operator to momentarily override a video router input selection, when keep pressing the joystick (iris control lever) on the camera remote control panel (RCP)² – or other dedicated switch used for same purpose. After the joystick is released, the video router input returns to the one that was last selected prior to joystick press. Quasi-simultaneous joystick presses are served in a first-in / last-out stacked order.

The JOyVerride 20i-BMD interface has a number of 20 general purpose interface (GPI) inputs, such that a maximum of 20 contact closures from 20 joystick camera RCPs can be connected to it.

Each GPI input can be configured to address a particular video router output. In this way, an arbitrary number of video router inputs can be grouped to serve an arbitrary number of video router outputs – useful, for example, when a single video router is used by two or more camera operators, each one operating a group of camera RCPs on their own video control monitor.

1 <http://www.blackmagicdesign.com>

2 Depending on manufacturer, the same camera remote control product category may have different names and abbreviations – eg. remote control panel (RCP), operational control panel (OCP), remote control unit (RCU), etc.

The GPI inputs are isolated with optocouplers, with each input tied to an internal floating +5V supply by means of 470Ω pull-up resistors. All GPI inputs share a common floating 0V rail to which each contact must be closed.

Note: the optocoupler isolated inputs is now provided as standard, being no longer an option.

The connection from the interface to the video router itself is done via Ethernet³. No additional equipment is required during normal operation.

The front panel has an informative alphanumeric display on it, 20 characters per line × 2 lines. On start-up, the IP and MAC addresses of the interface are briefly displayed, then during normal operation the IP address of the video router and its connection status is continuously displayed. By short pressing a utility front panel button, the IP and MAC addresses of the interface can be again briefly displayed, information which is useful when configuring the unit while in DHCP mode or when configuring the local area network for static DHCP.

Note: the unit is delivered with the DHCP mode turned ON, unless otherwise requested.

Configuration is platform independent and has to be done by directly editing a plain text file in terminal mode, either directly from within the unit or using a PC.

Several configuration methods can be used:

- (valid for: credential configuration, network parameters, GPI inputs assign) via serial remote session, by running a serial terminal on a PC connected through the dedicated USB terminal connection at the front side of the unit⁴ and then using typical Linux commands⁵;
- or -
- (valid for: credential configuration, network parameters, GPI inputs assign) via SSH remote session, by running a SSH terminal on a PC connected through the network and then using typical Linux commands⁵;
- or -
- (valid for: credential configuration, network parameters, GPI inputs assign) directly from the unit, by connecting to it a monitor with HDMI input, a USB keyboard and then using the native Linux terminal & typical Linux commands⁵;
- or -
- (valid for: basic network parameters, GPI inputs assign) via network, using the built-in web page⁶ that can be accessed from any web browser that is connected to the same network.

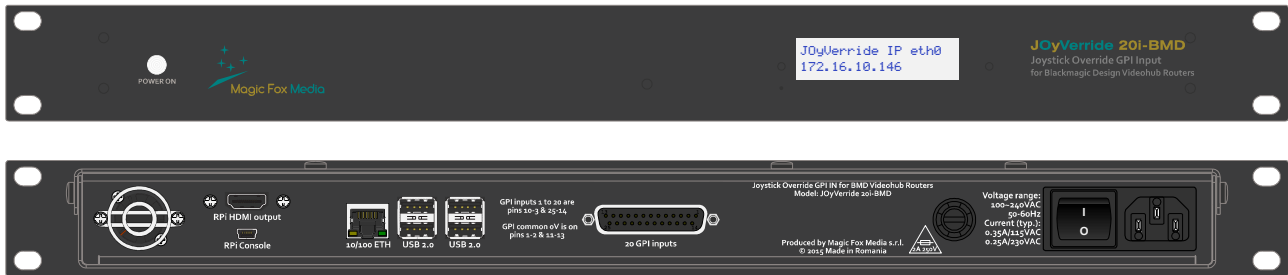
3 A wireless network connection can also be used, by connecting a Raspberry Pi compatible WiFi dongle to one of the JOyVerride 20i-BMD USB ports and then make a wireless connection to a router with WiFi capabilities on the local area network.

4 Although the unit is delivered with the USB terminal connector mounted on front of the unit, the internal connector assembly can also be mounted on the rear.

5 By directly editing a plain text configuration file. Care must be taken not to make typing errors when using this method.

6 Planned feature, not implemented at the time of this writing.

Front & rear panel layouts



Note: units delivered to European market have red illuminated ON/OFF power switch

Features summary

- 20 optical isolated GPI inputs, sharing a floating common 0V rail
- Each GPI input is internally tied to isolated +5V by means of pull-up resistors
- Each GPI input is triggered by connecting it to the GPI common 0V rail
- Any GPI input can be configured to serve any video router output
- All GPI inputs are equipped with hardware debouncing circuits providing clean interfacing of joystick mechanical switches
- Interface delay is between 20ms to 60ms approx. from contact closure to command send to the video router
 - actual delay depends on the joystick mechanical contact bouncing
 - overall delay may further increase slightly if the video router actively uses its video reference input for vertical interval synchronous switching
- Control is based on Raspberry Pi microcomputer
- Communication between JOyVerride interface and video router goes over network
- Configuration of credentials and network parameters has to be done by directly editing a plain text file in terminal mode, either by attaching a monitor with HDMI input and a USB keyboard directly to the unit, or via SSH remote session over network, or via serial remote session over USB serial connection
- Configuration changes are protected against unauthorized access, based on standard Linux user rights levels
- An alphanumeric 20×2 LCD display is provided on front panel for general status information
- Is built in a robust 1U rackmount enclosure, with internal power supply and IEC power connector
- An optional terminal block adapter is available for the GPI inputs connector

Specifications

| | |
|---|--|
| Number of GPI inputs | 20 |
| GPI inputs connector | DB-25 female connector on panel |
| GPI input electrical characteristics (each input) | Optocoupler isolated; Optocouplers inputs are connected to an internal floating +5V supply via 470Ω pull-up resistors; Contact closure goes to a floating common 0V rail, with 8mA (typ.) flow current per closed contact; Note: the metallic case of the DB-25 connector is NOT isolated, being always connected to the system earth ground (≐) together with the entire enclosure. |
| Controller | Raspberry Pi Model 2B Industrial, running Raspbian OS |
| Built-in network connection | 10/100 base-T Ethernet, Auto-MDI/X enabled |
| Terminal port | USB Mini-B connector, serial protocol, 115200, 1N8N |
| Peripheral ports | 4×USB 2.0 Type A connectors ⁷ |
| Monitor output | HDMI (rev. 1.3 & 1.4) connector, resolutions from 640×350 to 1920×1200 pixels |
| Cooling | Fan forced ventilation, air direction from left side to rear-right (when viewing the unit from front) |
| Fan noise | 23dB(A) (fan manufacturer specification) |
| Fan life expectancy | 60000 hours @ 40°C, 65% humidity, 90% CL (fan manufacturer specification) |
| Storage ambient temperature | -20°~70°C |
| Operating ambient temperature | 0°C~40°C long term, -10°C~50°C fault tolerance |
| Power input | IEC 60320-1 C14 type connector; ON/OFF switch at the rear side of the unit; ⚠ This equipment must be plugged only into power outlets which provide a protective earth contact ⚠ |
| Power voltage | 100~240VAC voltage range to ensure EMC safety regulations, -10% +6% fault tolerance; 50~60Hz frequency range, ±5% tolerance |
| Power consumption | 15W approx. |
| Dimensions | 1U rack sized front panel, 427.9mm×120mm×37.3mm actual case (excluding case assembly screws) |
| Weight | 2.3kg approx. |
| Environment compliance | Class A digital device – to be used only in commercial and industrial environments |

⁷ For more info regarding the USB electrical specifications and recommended peripherals, please consult the Raspberry Pi Model 2B documentation and associated general information available on the internet.

Ordering information

Base product:

- **JOYVERRIDE 20i-BMD**

Additional options:

- **JOY OPT-02**

Terminal block adapter for GPI input connections, 20 pairs with screw connection method, provides basic ability to bind the wires all together on adapter board with a small tie-wrap.



© 2015-2017 Magic Fox Media s.r.l.
<http://www.magicfoxmedia.ro/joyoverride>

Features, design and specifications are subject to change without notice.
Raspberry Pi is a trademark of the Raspberry Pi Foundation.
All other trademarks are the property of their respective owners.

Document rev. 0.F