OPTICIS
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Digital Video/Audio and Serial I/O Extender

User's Manual for the M5-2C2

Opticis Locations

Opticis Co., Ltd.   Opticis North America Ltd.

For order support, please contact your Distributor or Reseller.

For technical support, check with the Opticis web site www.opticis.com or

scanmagnetics.com

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All contents are subject to be changed without prior notice.

Manual Contents

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Pictorials

Welcome!

Congratulations on your purchase of the M5-2C2, Digital Video/Audio and Serial I/O extender. This manual contains information that will assist you in installing and operating the product.

Product Description

M5-2C2-TR offers integrated extension of digital video, audio and RS-232 interface up to 50m (160ft) for HDMI/DVI. It maintains HD video signals up to WUXGA (1920x1200) at 60Hz refresh rate for PC and 1080p for HDTV. It is compatible with full DDC2B and HDCP. It supports connecting one of 3 different audio types in the transmitter; RCA, PDIF (Optic) or SPDIF (Coaxial) and outputting all 3 audio types. RS232 serial interface offers device-to-device and device-to-controller connections to build up control system for A/V integration.

It is designed to multiplex and de-multiplex the DVI/HDMI video, digital/analog audio, Display Data Channel (DDC) command interface, High Definition Copy Protection (HDCP) and serial protocol so as to be linked over two CAT5 cables. It gives benefits of easy plug-and-go installation and offers you a cost effective solution for pro A/V system.

Shipping Group of M5-2C2 Digital Video/Audio and RS232 Extender

☐ **Tx and Rx boxes:** One Uplink module & One Downlink module.
☐ **AC/DC power adapter:** One +12V/3A unit (including AC cord).
☐ **User's Manual**
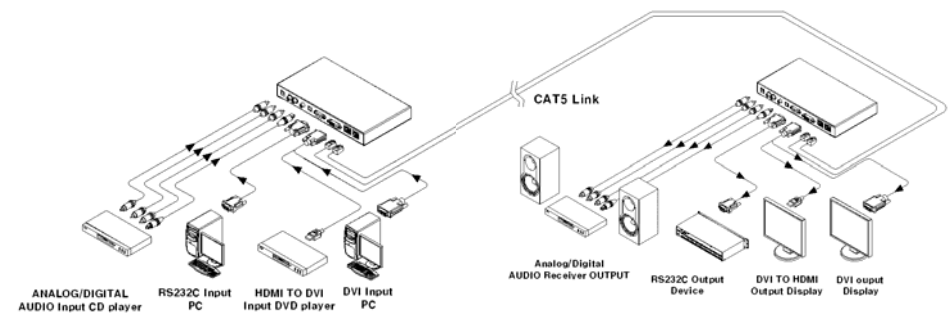☐ **Option:** DVI to HDMI cable, DVI cable, Dsub cable, Audio cable

Figure 1 – Overall Digital Video/Audio and Serial I/O Extender

1-1 Welcome, Product Description

System Requirements for Setup

☐ **Hardware requirements**

■ You have a graphic controller card with a DVI port in your Windows/Mac (Mac is option), or SUN system. It should support the maximum graphic resolution feature of the display to be connected.

■ In case of using a computer, no special memory size, CPU speed and chipsets are required.

■ Proper initial trial of the entire platform with its application using a short length copper cable is recommended prior to install with the optical link.

☐ **Software requirements**

■ No special needs, if the DVI graphic controller and display peripheral are operational with the platform's OS and application.

☐ **AC/DC Power Adapter Technical Advisory**

The power of M5-2C2 is designed to supply to either Uplink or Downlink module by plugging the power plug.

Installation

Important: Please use the installation procedure below. Improper, or no operation may result if the start-up sequence is not correctly followed.

Step 1
Carefully unpack the contents of the shipping group.

Step 2
With system power turned **off**, connect the Uplink module to the DVI receptacle of PC or other video source equipment by a DVI copper cable or a HDMI to DVI cable. If necessary, connect the RS232 cable plugs to each D-sub 9-pin connector on PC and Uplink module.
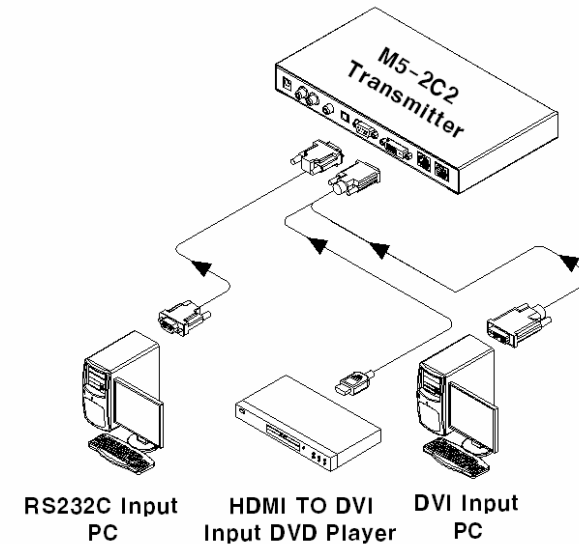

Figure 2 – Connection of DVI and RS232 Cable to Uplink Module

Step 3
Connect the Uplink module to the audio source equipment by audio cables such as RCA, S/PDIF coaxial cable and S/PDIF optical fiber.
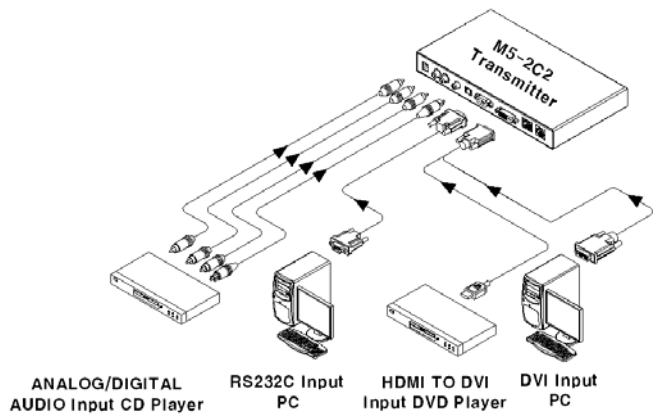
Figure 3 – Connection of Audio Cable to Uplink Module

You can select one of different 3 audio inputs - RCA, S/PDIF(coaxial) and S/PDIF(optical) - using the switch of front panel. Audio input is changed by the audio selection switch.

Figure 4 – Selection of Audio Input

Step 4
In the same way as above, connect the Downlink module to the display by DVI copper cable and to the audio output equipments such as media receiver or speaker by audio cable. The RS232 devices near the display can be connected by RS232 copper cables also.
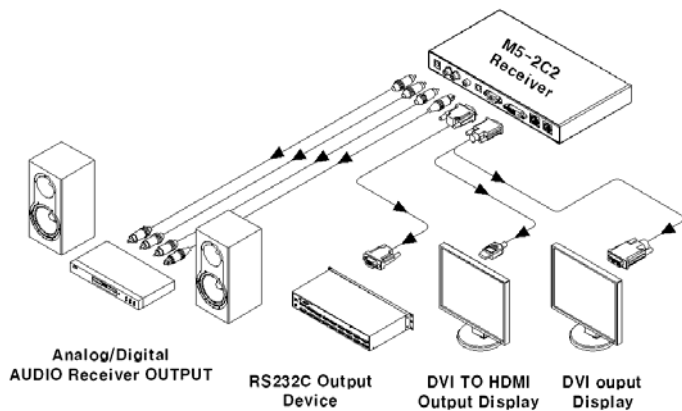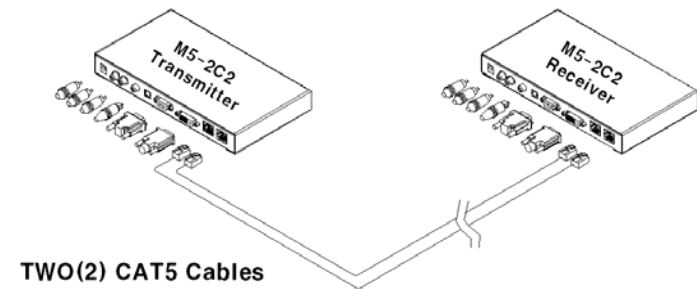

Figure 5 – Connection of Downlink Module

1-4 Installation (continued)

Step 5
Connect two(2) CAT5 or CAT6 cables to RJ45 receptacles of the Uplink and Downlink modules, as shown in Fig. 7. Opticis recommend solid shielded CAT6 cables. Carefully check the wiring sequence of CAT5 or CAT6 cable as Fig. 8 and ensure each RJ45 connector is fully engaged.

Figure 6 – Connection of Two(2) CAT5 Cables

1	White/Orange	1
2	Orange	2
3	White/Green	3
4	Blue	4
5	White/Blue	5
6	Green	6
7	White/Brown	7
8	Brown	8

Figure 7 – Wiring Diagram of CAT5 Cable (Direct Type)

Step 6
Connect an AC/DC power adapter to either Uplink or Downlink module as your availability of AC outlet. You can find power indication LED lit on in the both modules.
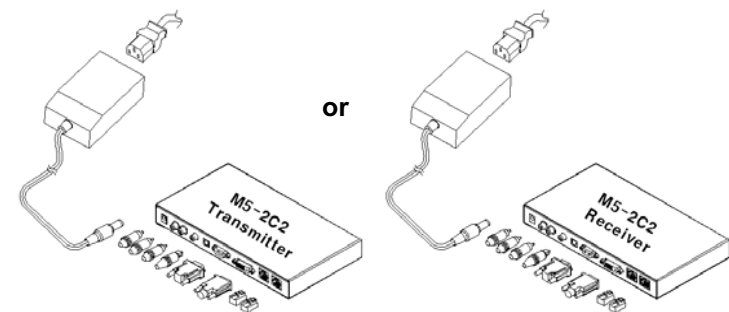

or

Figure 8 – Connection of AC/DC Power Adapter

1-5 Installation (continued)

Step 7

Power ON the PC and display or connected RS-232 devices. Ensure "DVI/HDMI" and "LINK" indication LEDs lit ON, representing secure connection of all kinds of cables. Confirm LED of the selected audio input lit ON.

Tip 1: If any status LED is not ON normally after all installation as guided in the above, we recommend you to push "RESET" button while all connections are set and the Uplink and Downlink modules are powered in. "Reset" function is designed for HPD(Hot Plug Detection) check.

Tip 2: Avoid "hot plugging" the Uplink as this is not recommended practice with live digital voltages.

Booster and EQ Mode Setting

Uplink Module

Downlink Module

Booster and EQ Mode is used extensions over 10 m (33 feet). By default, M5-2C2 transmitter and receiver are set to "BOOSTER" and "AUTO" respectively. Under the default setting, M5-2C2 is optimized for the length from 10m (33feet) to 40m (130feet). If you don't get a picture still or have noise, Booster and EQ Mode Setting are required like the followings.

1. Start by having the source equipments connected by cables and playing with your display on.

2. Set the transmitter to "BOOSTER" by "BOOSTER" switch on the front side of Uplink module. Check if the display is displayed normally.

3. If you don't get a picture still or have noise, set the receiver to "MANUAL" using "EQ MODE" switch of Downlink module.

4. Start with the "EQUALIZER" knob all the way counter clockwise and slowly turn the knob clockwise until the display is shown normally.

Table - Recommended Setting with the Length

Tx – Booster	Rx – EQ Mode	Acceptable Length
Normal	Auto	1~10m
Booster	Auto	10~40m
Booster	Manual	40~50m

Troubleshooting

The display displays only black screen.

- Check that all AC and DC plugs and jacks used by external power supplies (both Opticis and others) are firmly connected.
- Ensure that power LED lit ON.
- Ensure that the Uplink and Downlink modules connected correctly to the PC and display, respectively.
- Check if the PC and display are powered on and properly booted.
- Reset the M5-2C2-TR using Reset button on Uplink and Downlink modules.
- Test to make sure the modules are working normally with short CAT5 or CAT6 cable 5~10m. If you get the good video at the short length, you have to set the correct booster and EQ mode as guided on page 1-6.

Screen is distorted or displays noises.

- Reset the M5-2C2 using Reset button on Uplink and Downlink modules.
- Reset the system.
- Test to make sure the modules are working normally with short CAT5 or CAT6 cable 5~10m. If you get the good video at the short length, you have to set the correct booster and EQ mode as guided on page 1-6.

Maintenance

No special maintenance is required for this product. Ensure that this product is stored or used in a benign environment free from liquid or dirt contamination.

There are no user serviceable parts. Refer all service and repair issues to Opticis or its authorized distributor.

Technical Support and Service

For commercial or general product support, contact your reseller. For technical service, contact Opticis by email techsupp@opticis.com or visit its website at www.opticis.com.

Product Specifications

M5-2C2 Digital Vide/Audio and Serial I/O Optical Extender

- ☐ **Compliance with DVI standard:** supports DVI 1.0 of DDWG, using fiber-optic communication links and DDC2B.
- ☐ **Compliance with HDCP :** supports HDCP
- ☐ **Extension limit:**

  50m (160feet) at WUGA (1,900x1,200) 24bit color at 60Hz refresh rate for PC and 1080p for HDTV.

- ☐ **Audio:** Input - Selectable RCA, S/PDIF(coaxial) or S/PDIF(optic)

  Output - RCA, S/PDIF(coaxial) and S/PDIF(optic)

- ☐ **RS232C:** supports D-sub 9 Pin connectors for RS232C.
- ☐ **Cable Connection:** The transmitter and receiver boxes of M5-2C2 have two(2) RJ45 receptacles connected to two(2) CAT5 or CAT6 cables.
- ☐ **Mechanical specifications of Uplink and Downlink boxes**
  - ■ **Dimensions:** 240mm / 130mm / 31mm (W/H/D)
  - ■ **Weight:** 440 ± 10 gram for each of Uplink and Downlink module.
- ☐ **Environmental Specifications**
  - ■ Operating temperature: 0°C to 50°C
  - ■ Storage temperature: - 10°C to 70°C

AC/DC Power Adapter

- ☐ **Power Input:** Universal AC 85-264V, 50/60Hz, AC power cord with power jack.
- ☐ **Power Output:** +12 V, 3.0 A SMPS DC-power Adapter
- ☐ **Cord DC Jack & length:** Core is 12 V and outer cylinder is GND. Length is 18.5 cm
- ☐ **AC Cord length: 1.8m**
- ☐ **Certification: PSE, UL, cUL, FCC, CE, TUV-GS**

Warranty Information

1 (One) Year Warranty

Opticis warrants this Digital Video/Audio and Serial I/O Optical Extender to be free from defects in workmanship and materials, under normal use and service, for a period of one (1) year from the date of purchase from Opticis or its authorized resellers.

If a product does not work as warranted during the applicable warranty period, Opticis shall, at its option and expense, repair the defective product or part, deliver to customer an equivalent product or part to replace the defective item, or refund to customer the purchase price paid for the defective product.

All products that are replaced will become the property of Opticis.

Replacement products may be new or reconditioned.

Any replaced or repaired product or part has a ninety (90) day warranty or the reminder of the initial warranty period, whichever is longer.

Opticis shall not be responsible for any software, firmware, information, or memory data of customer contained in, stored on, or integrated with any products returned to Opticis for repair under warranty or not.

Warranty Limitation and Exclusion

Opticis shall have no further obligation under the foregoing limited warranty if the product has been damaged due to abuse, misuse, neglect, accident, unusual physical or electrical stress, unauthorized modifications, tampering, alterations, or service other than by Opticis or its authorized agents, causes other than from ordinary use or failure to properly use the product in the application for which said product is intended.

FCC/CE Statement for Regulation of Electro-magnetic Emission

This device complies with part 15 of FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 and 2 of FCC Rules, EN 55022/55024/61000-3 for CE certification. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and. if not installed and used in accordance with the instruction guide, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Re-orient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult a service representative for help.

Properly shielded and grounded cables and connectors must be used in order to comply with FCC/CE emission limits. Changes or modifications not expressly approved by the party responsible for compliance could void the user s authority to operate the equipment.