Opto 232
Adapter

Applications and
Operation Manual

AVE

STRENGTH IN THE BUSINESS
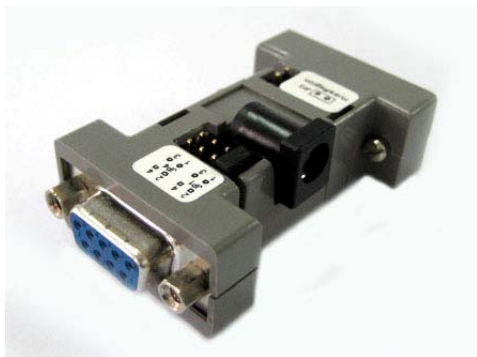
Opto 232 Adapter

RS-232 Bi-Directional Optically Isolated Adapter

- **Introduction**

The Opto232 is designed specially for the VSI-Pro but will work with any RS-232C device. It basically separates the ground signal from the transmitting device to the receiving device by optical LED devices.

The specific application is to optically isolate the RS-232 signals and ground from cash registers to the VSI-Pro and the CCTV system. Many CCTV systems use many different power sources to power the cameras which are normally very far from the recording system. This can create power ground loops which make the ground signal of the CCTV system be at a higher voltage other than zero or ground. When this high voltage ground is connected to the cash register ground all kinds of problems can arise and can damage either the CCTV system or the cash register or both. Therefore isolating the ground signal via the Opto232 prevents this problem.

- **Function**

The Opto232 requires a power source for the VSI-Pro side and another power source from the cash registers side. Since the VSI-Pro can power external devices via the DTR (Pin4) and DSR (Pin6) of its DB9F connector an external power source for the VSI-Pro side is not required and no external power supply connector is supplied. Therefore if you use another device other than the VSI-Pro you must make sure one of these pins can supply a minimum of 10 VDC or you must wire a user supplied external supply to one of these pins.

The cash register side has an external power supply connector to use a standard 2.1 x 5.5 mm DC Coax power connector and unregulated 12VDC should be used. However the Opto232 has jumpers to select using DTR (Pin4) and DSR (Pin6) to power to the Opto232 if the cash register has this ability. However, if the cash register is just using its TXD signal to send data to the VSI-Pro no power supply or power connection is required. This power source is only required if data from the VSI-Pro is to be sent to the cash register and the cash register receives the data on its RXD.

- **Shielding**

The metal shield of a DB9 connector is normally connected to the shield of the cable to eliminate RFI and EMI interference in the RS-232 signal. In the Opto232 the metal shield of each DB9 connector is not connected to anything so a true isolation between input and output. Therefore the shield of any cable to the Opto232 must be connected to the shield of the sending or receiving device since no connection is made to or through the Opto232.

- **VSI-Pro Connection**

In most cases the Opto232 can plug in line with all the standard cash register cables from AVE. It also can plug directly to the DB9F connector on the rear of the VSI-Pro. A standard CR-802 cable which is a DB9M to DB9F 9 conductor extension cable can also work between the VSI-Pro and the Opto232 or between the Opto232 and the register.

• DVR Connection

Since the DVR ground is normally part of the CCTV ground it should be connected directly to the ground of the VSI-Pro. If you are using the TXD output of the VSI-Pro to the DVR, Regcom, Networker or Vnetworker then you should use an AVE "Multifunction Cable Adapter" directly on the rear of the VSI-Pro and then use the Opto232 after that connection to the cash register. The Multifunction cable will wire the TXD signal with the VSI-Pro ground directly to the DVR before the Opto232 and isolate the ground from the DVR from the cash register. If you wish to isolate the ground of the VSI-Pro from the DVR then you should use another Opto232 or that purpose. It is not recommended to connect the DVR ground to the cash register ground but in many cases for properly installed CCTV systems this will be okay.

• Other Connections

Jumpers are provided in the Opto232 to defeat standard RS-232C Hardware handshaking functions without special cable wiring. It allows you to short RTS and CTS together and/or DTR and DSR together via convenient jumpers.

• **Connector Pin Out and Assignments**

DB9M to VSI-Pro Side

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1 – N/C
2 – TXD
3 – RXD
4 – DTR   Connected to power the Opto232
5 – GND
6 – DSR   Connected to power the Opto232
7 – RTS  N/C
8 – CTS  JP1    ON    = Connected to power of the Opto232
                OFF   = N/C
9 – N/C
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DB9F from Cash Register Side

```
1 – N/C
2 – RXD
3 – TXD
4 – DTR  JP1 1-2  ON    = Connected to power the Opto232
             1-2  OFF   = Not Connected to power the Opto232
         JP2 3-4  ON    = Short DTR (4) to DSR (6)
5 – GND
6 – DSR  JP1 3-4  ON    = Connected to power the Opto232
             3-4  OFF   = Not Connected to power the Opto232
7 – RTS  JP2 1-2  ON    = Short RTS (7) to CTS (8)
8 – CTS  JP2 1-2  OFF   = No Short
9 – N/C
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2.1mm X 5.5mm
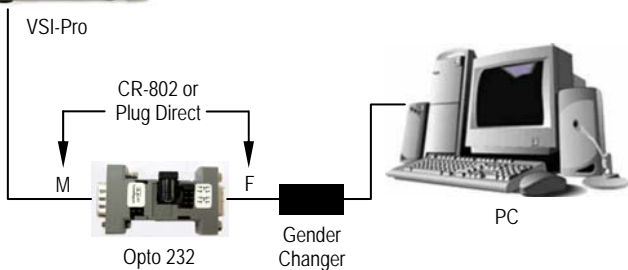DC Coax Jack

2 4
JP1 JP4
1 3

2 4
JP3
Hydra Regcom
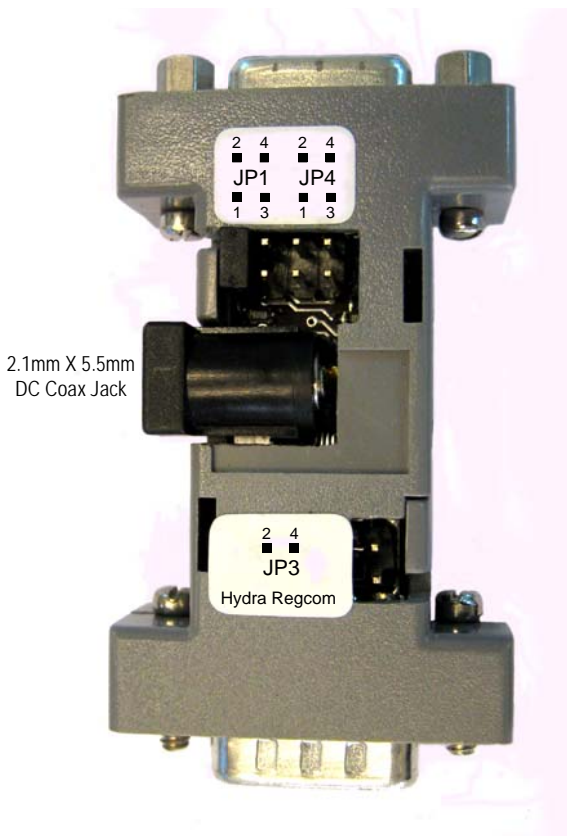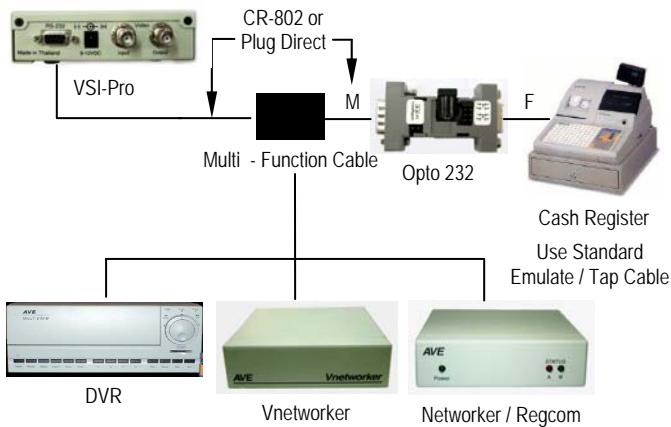
VSI-Pro Opto 232 with DVR, Networking, Regcom
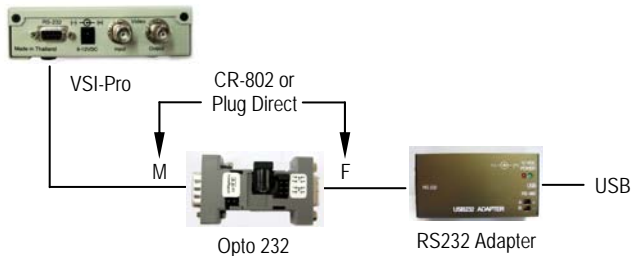
VSI-Pro Opto 232 & USB232

PIN 7 - 8
PIN 4 - 6 & Powered

VSI-Pro

CR-802 or
Plug Direct

M   F

Opto 232

Gender
Changer

PC

VSI-Pro to PC Opto 232 Powered by PC

PIN 7 - 8
PIN 4 - 6 & Powered

VSI-Pro

CR-802 or
Plug Direct

Power Supply

M   F

Opto 232

Gender Changer

PC
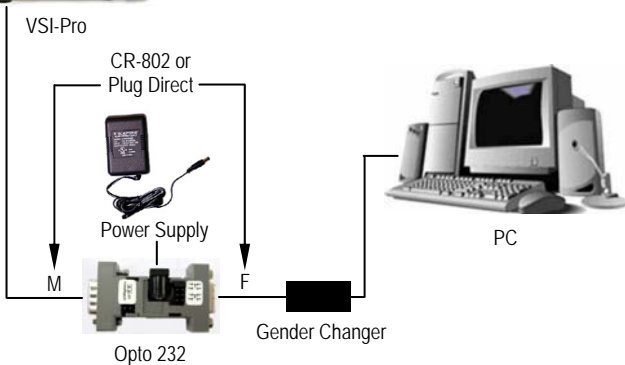
VSI-Pro to PC External Power
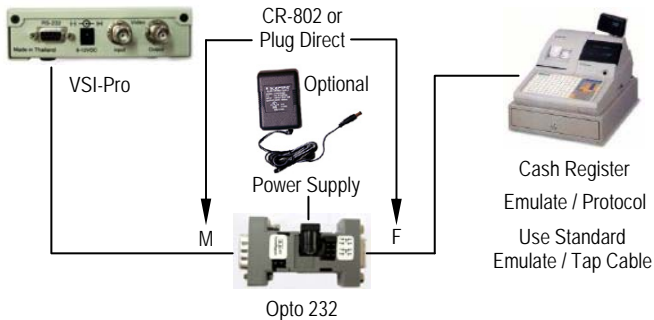
VSI-Pro Opto 232
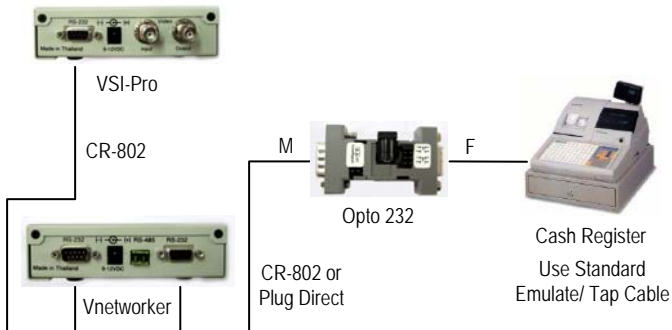
VSI-Pro with Vnetworker & Opto 232

Notes

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March 2008