Hardware User's Manual

Digital Video Motion Detector DVMD1-X

Version 010
Revision A

July, 2004

RADIANT

Radiant, Inc.

TECHNICAL SPECIFICATIONS

VENDOR   Radiant Inc.   http://www.dvmd.com

PART NUMBER: 801-004

OPERATING TEMPERATURE RANGE: 0-60C.

POWER REQUIREMENTS

The DVMD1X will accept 8 to 36VDC or 24VAC. If DC power is shared between devices the GROUND must be the same for all units. At 12V input the supply must be rated at 1.1 watts or greater, which is 12V at 100 mA or more.

INTRODUCTION

This is a manual for the installation, setup, and configuration of the DVMD1-X. It contains step-by-step instructions for connecting the DVMD1-X in a system. Please also refer to the XPORT User Manual to change the IP address and Local Port number for each DVMD1-X.

The minimum DVMD1-X configuration must contain:

- At least one DVMD1-X and Power Supply
- The PC program, ManagerNET.exe, to communicate with the DVMD1-X.
- This User's Manual.

The user must provide the following:

- A Windows based computer with NIC card and crossover cable or Hub/Router
- An 8 to 40 volt power supply (AC or DC)
- A video camera
- A CCTV monitor
- Two 75 ohm coaxial cables with BNC connectors

Any questions or comments regarding the DVMD1-X Hardware User's Manual should be sent to:

Radiant, Inc.
2395 Kenwood Drive
Boulder, CO 80303
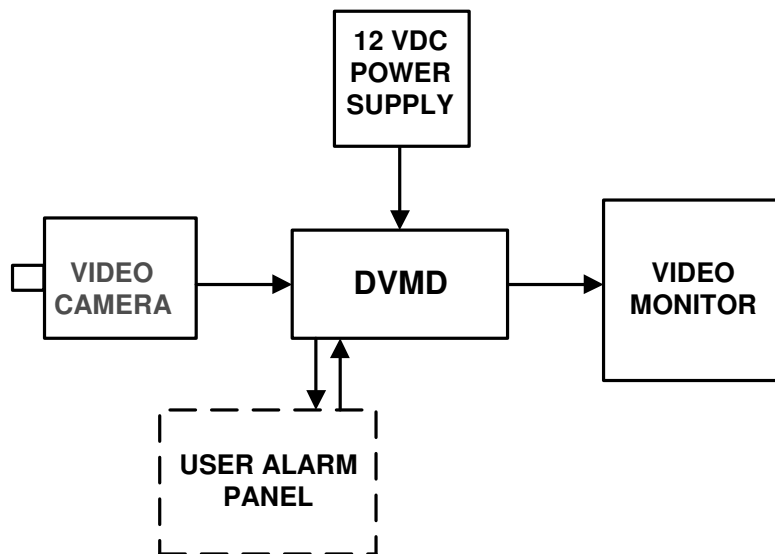
Phone: 303-543-0440
FAX: 303-543-0440

E-mail: lyle.powers@dvmd.com

Operating Configurations

The DVMD1-X is a standalone product with its own Digital Signal Processor (DSP). It requires only power and video input and produces video output with overlay and a dry contact relay alarm. The user customizes the performance to accommodate site-specific operational requirements.

A security system with multiple video cameras may use a single DVMD1-X that is connected to other DVDM1s through the CHAIN cable. Each subsequent DVMD1 must be assigned a unique address on the rotary switch. The address of the DVMD1-X is always set to "FF0". Setting up the addresses is covered in a later section of this manual.

Figure 2A illustrates the DVMD1-X in the single-unit configuration. All of the signal processing and user settings are saved in the configuration portion of the onboard flash memory. This allows the DVMD-X to be configured for stand-alone applications.

```
                    ┌──────────┐
                    │ 12 VDC   │
                    │ POWER    │
                    │ SUPPLY   │
                    └────┬─────┘
                         │
                         ▼
┌──────────┐        ┌──────────┐        ┌──────────┐
│ VIDEO    │───────▶│          │───────▶│ VIDEO    │
│ CAMERA   │        │  DVMD    │        │ MONITOR  │
└──────────┘        └────┬▲────┘        └──────────┘
                         │
                    ┌ ─ ─┴─ ─ ─┐
                    │ USER ALARM │
                    │ PANEL      │
                    └ ─ ─ ─ ─ ─ ┘
```

Figure 2A – DVMD1-X Single Unit Configuration

Figure 2B illustrates a DVMD1-X (address=FF0) connected to a host computer. The HOST communicates to the DVMD-X through a CAT5 cable connected to the RJ45 port. A crossover cable must be used for direct connections from the HOST to the DVMD1-X.
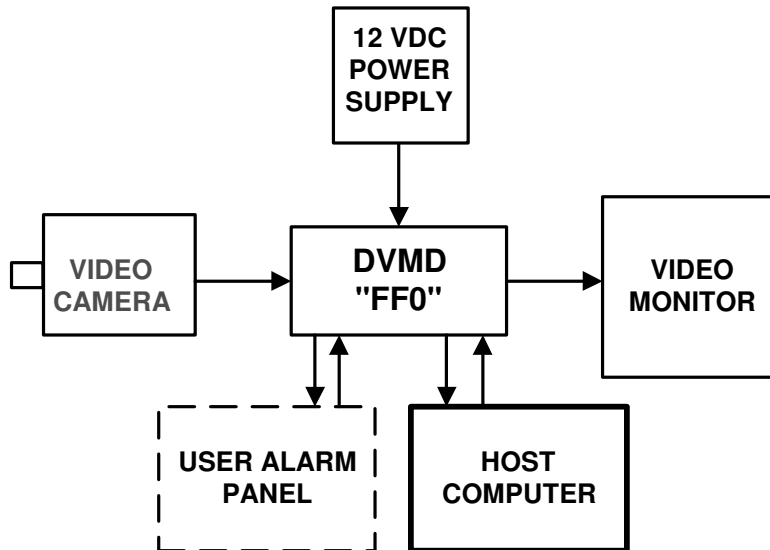

Figure 2B – DVMD1-X Connected to Host Computer

Figure 1C illustrates a block diagram of three DVMD chained together by the RS485 serial link. The host communicates to the first DVMD, which is chained to two other DVMD1s. A common power supply insures that all DVMD1s receive the RS485 data correctly.
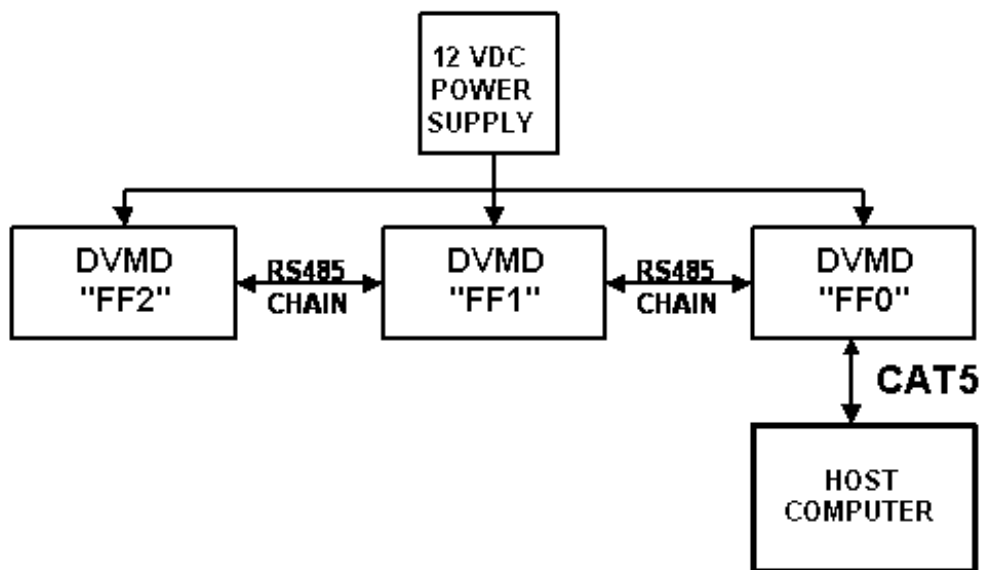

Figure 2C – DVMD-X Chained Configuration

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DVMD1-X OVERVIEW

The Digital Video Motion Detector (DVMD) measures 3.5"x5"x1.25" and is housed in an extruded aluminum case as shown in Figure 3.

Figure 3 – DVMD-X

The unit receives video from the camera through the BNC connector labeled VIN and provides buffered video output (after internal processing, clamping, automatic gain control (AGC), and overlay) through the BNC connector labeled VOUT.

The Screw Terminal (Digikey 277-1166) provides access for +12 volt DC power, opto-isolated input and dry contact relay alarm output. The opto-isolated input is active when driven from an external voltage source between 4 to 24 volts. The function of the opto-isolated input is application dependent. A dry contact relay alarm output is also provided. The pin connections for these functions are shown in Table 1 below.

PIN NUMBER	PIN CONNECTION	FUNCTION
Pin 1	V+	+12VDC
Pin 2	V-	Ground
Pin 3	I+	Opto-Isolated input + terminal (External 4-24 VDC)
Pin 4	I-	Opto-Isolated input - terminal (External Ground)
Pin 5	NC	Alarm Relay Normally Closed
Pin 6	COM	Alarm Relay Common
Pin 7	NO	Alarm Relay Normally Open

Table 1 – Screw Terminal Pin Connections and Functions

ALARM RELAY USAGE
The alarm relay contact information is on the NC, COM and NO connectors. NC is normally closed when the power is "off" to the DVMD1-X. NO is normally open when power is "off" to the DVMD1-X. Most users will need the NO and COM terminals. The NC terminal is brought out to provide both options.

Most alarm systems need to OPEN when:
1. There is an alarm.
2. There is a power loss to the DVMD
3. There is a broken wire from the NO and COM wires to the host

The DVMD1-X is designed to do all three functions using the NO and COM terminals.
1.   When the power is "OFF" NO is OPEN
2.   When there is an alarm NO is OPEN
3.   When there is a broken wire NO "looks" OPEN.

NETWORK CONNECTOR
The Network (RJ45) connector is located on the Back Panel. The communications to the Host Computer is 100 base T Ethernet provided by an embedded XPORT device.

PTZ CONNECTOR
The PTZ port connections are made with an RJ12 connector crimped on a 6-wire phone cord.
Buy Digikey H2442-25 for short runs up to 25 feet. Intermediate runs to 100 feet need:
1.   Digikey part number A9118 (100 pcs of Amp's crimp connector PN 5-555042-3)
2.   Digikey part number H0063-100 specifies 100 feet of 6-conductor black phone cord.
3.   Digikey part number PAL1545.1 for an inexpensive crimp tool.

A modular adaptor is needed to connect the DVMD1-X to a serial port on the HOST. Table 2 shows the pinout of the DB9 connector (LCOM REC096F or Digikey 046-0003).

DB 9 PIN NUMBER	RJ12 Color	FUNCTION
Pin 2	White	RS232 Data Transmitted to PC
Pin 3	Blue	RS232 Data Received from PC
Pin 5	Black	Ground

Table 2 – DB9 Female Adapter Pinout

The DVMD is provided with a graphical user interface (GUI) for setup through a program called *ManagerNET.exe* that runs on the PC Host Computer. Most applications will use the factory default settings; however the user has the option of adjusting these settings to optimize performance for each camera. The latest version may be downloaded at www.dvmd.com.

CONNECTION INSTRUCTIONS

Connecting the DVMD to a camera and computer is a simple process. The connections should be accomplished in the sequence outlined below.

- **Step One:**

    Connect the +12 VDC Power Supply by attaching the positive supply output to V+ and ground to V-. These screw connectors are located on the Front Panel of the DVMD-X (See Figure 4).
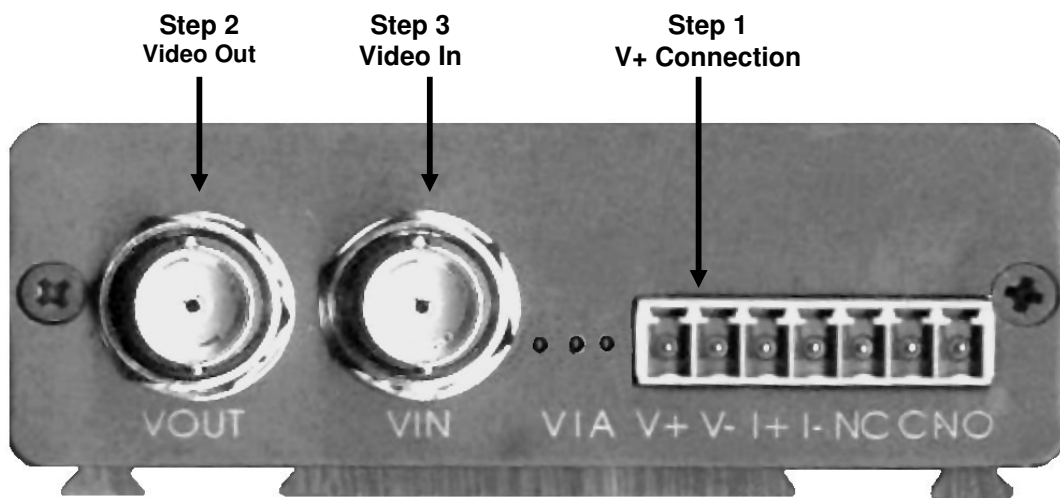

Step 2
Video Out

Step 3
Video In

Step 1
V+ Connection

Figure 4 – DVMD Front Panel

- **Step Two:**

    Connect a 75 ohm Coaxial Cable from the VOUT BNC connector located on the DVMD Front Panel (See Figure 3) to the Video In port on a CCTV Monitor.

- **Step Three:**

    Connect a second 75 ohm Coaxial Cable from the VIN BNC connector on the DVMD Front Panel (See Figure 3) to the Video Out port on a camera.

- **Step Four:**

    Connect the NETWORK connector (See Figure 5) to a HUB/Router with a CAT5 Cable, or to the NIC card in the PC using a crossover cable. The Green LED should light up when the network connection is established.
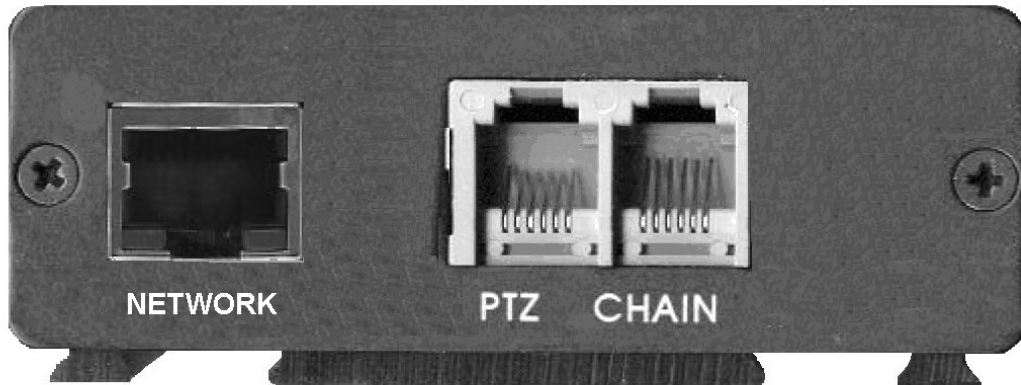
Figure 5 – DVMD1-X Rev B Rear Panel

- **Step Five:**

    The Unit Address is internally set to FF0 for the DVMD1-X so there is no rotary switch The RS485 CHAIN is internally terminated so there is no TERM switch on the DVMD-X. All other DVMD1-X termination switches should NOT be terminated. A six-conductor phone wire may be used to connect from the CHAIN output of the first unit (FF0) to the next unit.

    Power up the camera, the CCTV monitor and the DVMDs. You should get a video picture with overlay on the monitor. If you do not get a picture on the monitor re-check Steps 1 – 6 above. If you do get a video image on the monitor, proceed with loading the User Interface Software as described in the User Interface – Manager Tools Window paragraph below.

    If the power to the DVMD is off, the video from the camera is connected directly to the CCTV monitor through an internal video bypass relay. In the power off state, no DVMD functions occur, and no overlay is generated.

User Interface – Manager

    You may download the most recent firmware and software at www.dvmd.com. The *ManagerNET.exe* program provides the user interface to the DVMD. Please refer to the DVMD Software User's Manual for further information.

XPORT User Manual

    Please also refer to the XPORT User Manual to change the IP address and Local Port number for each DVMD1-X.

DVMD1-X PTZ JUMPERS
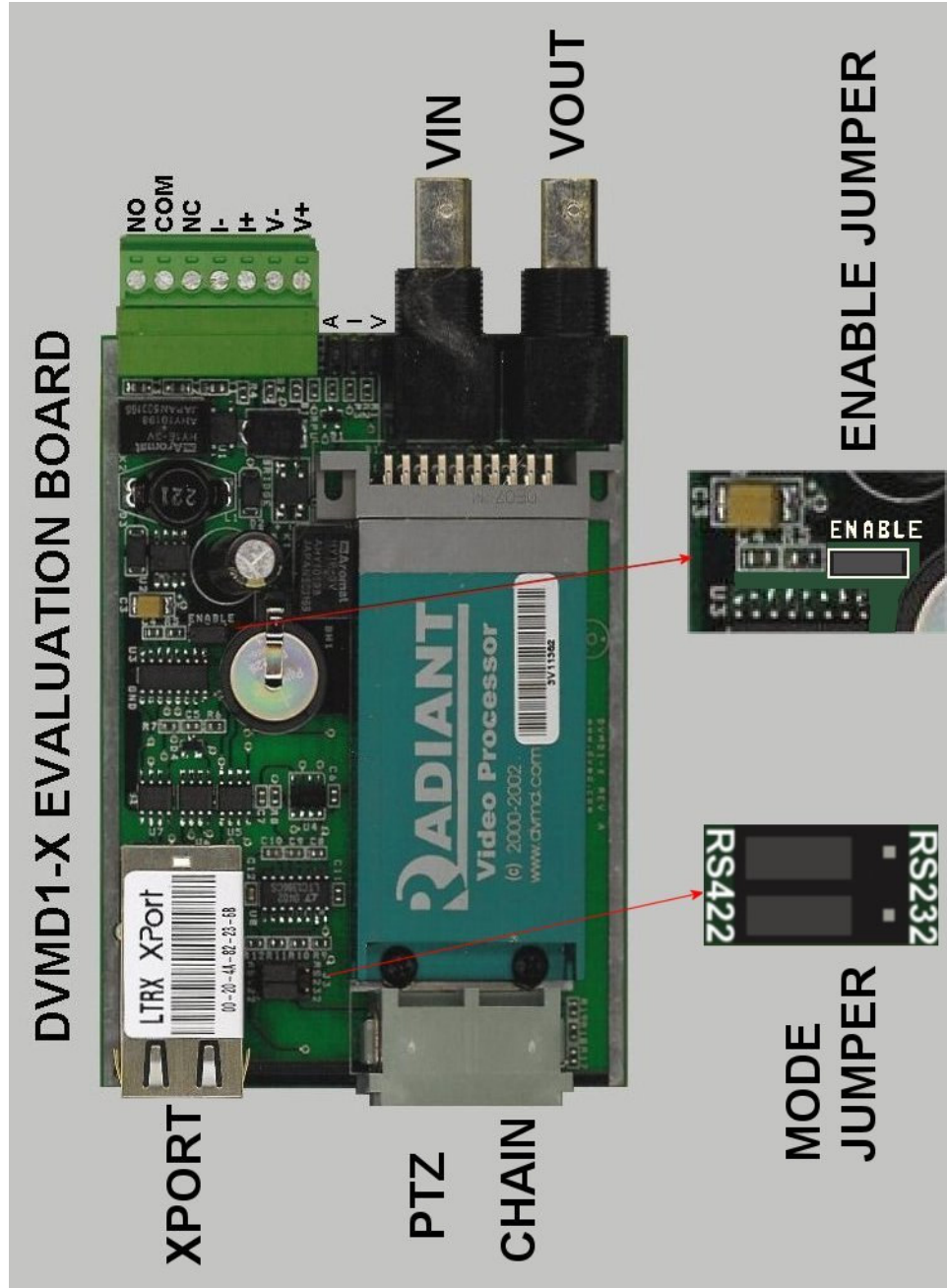
Figure 6 below shows the DVMD1-X PCB and identifies the PTZ Jumpers as shipped.

Figure 6 – DVMD1-X Enable Jumper