



Intelligent Digital Switch

MODEL: IDS-1600

Each IDS-1600 System can be rapidly deployed to meet most interoperability needs!



INTRODUCTION

The VDV Media's IDS-1600 Intelligent Digital Switch is an advanced solution for providing the foundation to solve your communications interoperability needs. The IDS-1600 Intelligent Digital Switch can interconnect up to 16 audio ports and expand to 32 ports with FXS, FXO, and Radio Interface cards for Low band, VHF, UHF, 800Mhz, 900Mhz and other radio bands. The system is designed with the latest

technology and it provides non-blocking switching, VOX or COR capability. Each Radio Interface port can handle multiple radio groups to simplify system design and reduce cost. Automatic call setup and routing capability will allow easy to use and efficient communication network.

MAIN FEATURES:

- **Auto Ports:** 16 ports expandable to 32 ports
- **Data Ports:** up to 20 RS232 COM ports.
- **Technology:** Digital TDM (Time Division Multiplexed) and DSP (Digital Signal Processor), Packet switching.
- **Non-Blocking switching platform.**
- **Modular and Scalable system.**
- **Radio Interface:** Suitable for HF, Low Band, VHF, UHF, 800Mhz, 900Mhz, LMR radios and SATCOM & others.
- **Radio Interface Module:** The radio interface module is used to interface with RF radio transceiver and other four wire audio devices. It will receive audio upon carrier detect signal and sent PTT, COR, VOX.
- **Up to 16 Multiple Simultaneous Two-way or Conference Calls**
- **Multiple Group IDs encode decode.**
- **External DTMF control**
- **Telephone Interface module:** Loop Start (Pots), FXS, FXO.
- **Console software provides system setup and control, Serial remote control.**
- **Rugged, transportable systems are available.**
- **Hot swappable modules.**
- **19" rack mount 3U package.**

APPLICATIONS:

- **Interoperability System**
- **Public Safety Communication**
- **Mobile First Response Unit**
- **Cross band, cross protocol platform communication fixed site.**
- **Dispatch Fleet calls**
- **First Alert Communication**

SYSTEM OVERVIEW

The main purpose of the Intelligent Digital IDS-1600 is to provide interoperability between different communication systems. The IDS-1600 is scaleable modularized communication system used to control and interconnect various types of radios and communication protocols. Its main components are the Switching Controller Module and the interface modules, each design to connect to a different communication medium such as HF, VHF, UHF, 800Mhz, 900Mhz, SATCOM, and telephone and local operator. The system also includes a power supply module, a 19" rack chassis to house the modules and a back plane to provide control and direct audio and digital signals between modules.

MODULES:

- PSM- A200W Power Supply Module
- ISCM- Intelligent Switch Control Module
- PSTN Interface Card (CO)
- EXPM- Extension Phone Module
- RIM- Radio Interface Module including
- VMR/Noise Reduction with integrated audio processing
- DIP- Data Interface Card

MODULE DESCRIPTIONS

PSM-Power Supply Module-

The PSM is a 200 W power supply that fits into the first slot of the chassis. The supply furnishes +12V, -12V, 5V and 3.3V to the modules.

ISCM-Intelligent System Control Module-

The ISCM Module contains an advance Digital Signal Processor with flash ROM, RAM, which controls the other system modules through the chassis. Switching control, call processing, call routing, security are all managed through the ISCM. It has built in two (2) RS232 ports. One controls programming using local or remote PC & VDV Media's Computer Control software. The second connects to expansion unit increasing the number of available ports from 16 to 32.

PSTN-2 or PSTN-4 Modules-

Each PSTN Module contains either two (2) two wire or (4) loop start ports to connect the IDS-1600 system to the public or PBX telephone

system. This 2-port design gives effective resource management of the system. The PSTN Module provides two (2) front panel four-wire ports for interfacing communication to public telephone network or to cellular phones.

EXPM-2 or EXPM-4- Expansion Phone Module-

Each EXPM Module contains either two (2) or (4) ports. In addition to basic loop-start signaling for POTS, each 2-wire FXS port is supported. FXS interfaces are typically used for direct connection to 2-wire telephones in the following loop-start applications:

- Off-Premises Extension (OPX)- where a telephone connected to the local PBX can be connected to an off-premises telephone, by dialing only the extension number assigned to that phone.
- Private Line, Automatic Ring-down application (PLAR) (also referred to as Hot Line) - where two telephones are connected directly via the network link. When the telephone on one side goes off-hook, the other telephone rings. This system has an internal ringing voltage feed that supplies the connected telephones and therefore an external DC power source is not needed.

RIM-2 or RIM-4-Radio Interface Module-

Each RIM Module contains either two (2) radio ports or four (4) radio ports and has built in VMR/Noise Reduction with integrated audio processing, which eliminates the need for additional equipment to produce tone keying for remote radios or digital delay for trunking radios. To produce remote tone keying, the DSP injects a tone into the transmit audio signal of a 4-wire circuit to the remote radio.

Trunking radios need time to acquire an available channel. The channel acquisition times for cross-connecting a conventional to a trunking radio can cause loss of the initial conversation. To prevent this loss, each RIM module introduces a programmable digital delay in the transmit audio path to the trunking radio while allowing immediate keying to the trunking radio from the conventional radio channel.

Each RIM Module will support four groups! This allows the set up of multiple groups per radio and dramatically increases the efficiency of the IDS-1600. With the multiple group support a separate radio module would be required for each group that could affect the sensitivity of the radio

system and would minimize the overall interoperability of the system.

DIP-Data Interface Card

The DIM card is a RS232 COM port, which supports 300bbs to 115Kbps with an asynchronous interface. The asynchronous interface can run at speeds from 300 up to 115,200bps. Up to 156 COM ports can be used in one system.

SPECIFICATIONS:	
Interface	RS232
Number of Interfaces per card	2
Maximum Number	20
Conformity	RS232
Mode	Asynchronous
Bit Rate	50bps to 115Kbps
User Interface	DCE
Character Length	7/8
Stop Bits	1/0 (Auto-Select)
Parity	Even / Odd / 0's / 1's / none (Auto-Select)

BACKPLANE:

The backplane contains power, audio and digital structure that routes the audio, data and control signals between the modules. The ISD1600 modules plug into the 64-pin card edge connectors on the inner side of the backplane board; located on the front of each module is the connectors to the outside world. The modules communicate with each other using advance switch routing technology. In addition to the PSM Power Supply Module there are 5 connectors to the backplane.

SYSTEM SOFTWARE:

The ISD1600 system software resides in the memory on the ISCM Module and controls each of the ISD-1600 modules as well as all aspects of the unit's operation with the outside communication world. The system software resides in the main DSP and controls call set up, user interface, packet switching control, call routing and system configuration. The ISD-1600 will store the memory of all software controlled configuration parameters that interface with the various modules. These parameters are re-loaded into the modules at systempower-up. MTTR (Mean Time to Repair) is dramatically reduced because reconfiguration adjustments are not made if a module is replaced.

Custom Software- not all installations are the same! Because of this, the IDS-1600 software can be adapted by VDV Media to meet the requirements of its customers.

SECURITY:

Multi layer cross banding permission- Cross banded groups can be created with 3 layers of permission a) Set up only by authorized users via a locally connected PC or remote PC. b) Set up by radios with DTMF capabilities and authorizing security codes. c) Set up by any radio on the system with DTMF.

DYNAMIC GROUP SET UP:

Dynamic set up of cross banding of radios- Using the DTMF capabilities of any radio or remote telephone, a user can set up calls between different radio groups operating on different frequencies. An authorized user can set up a temporary dispatch group call between different radio groups that have not been pre-programmed in the switch and then tear it down when the temporary group is no longer necessary.

COMPUTER CONTROL SOFTWARE:

Each IDS-1600 is supplied with easy to use Computer Control Software that is Windows 98, Windows NT, Windows 2000 and Windows XP compatible. This software resides in the ESCM Module and communicates both locally and remotely through the RS-232 Serial Port of the ISCM module. Its GUI (Graphic User Interface) is designed to be easy to learn and easy to use. This software coupled with an exterior interface box allows a remote operator to listen to and control the system over LAN, Internet or WAN. The IDS-1600 utilizes the newest and most advanced packet switching technology. While circuit switching keeps the connection open and constant, packet switching opens the connection just long enough to send a small chunk of data (packet) from one system to another. What happens is this: The sending computer chops data into these small packets, with an address on each one telling the network where to send them. When the receiving computer gets the packets, it reassembles them into the original data.

Packet switching is very efficient. It minimizes the time that a connection is maintained between two systems, which reduces the load on the network. It also frees up the two computers communicating with each other so that they can accept information from other computers as well.

EXPANDED SYSTEM

The IDS-1600 will accommodate up to 16 interface ports along with one power module, one intelligent switch control module. The IDS-1600 also allows a second chassis to be connected. In doing so, it becomes an IDS-3200 and adds the capacity for up to 16 additional ports. NOTE: A fully loaded IDS-1600 may contain 32 ports with 16 simultaneous two-way conversations using 32 ports.

SYSTEM APPLICATIONS

All installations requires an IDS-1600 with an ISCM Intelligent Switch Control Module and one PSM Power Supply Module plus one or more to the listed modules. The important design factor in the IDS-1600 is that it is non-blocking. This means that it permits voice paths between cross-banded radios, PBX voice channels and SATCOM terminals to happen simultaneously! The IDS-1600 supports up to 8 simultaneous paths and the IDS-3200 supports 16 paths. In emergency situations, remote operators and remote users can set up unique calls between different emergency groups.

INTEROPERABILITY RETRANSMISSION SYSTEM:

By using one or more RIM Modules a very complex site controller system can be designed with any combination of conventional and trunking radios supporting up to 16 simultaneous conversations. Cross banding configurations can be pre-configured or can be dynamically created with any radio using DTMF signaling. Because each RIM Module port can support up to 4 groups, complex configurations can be created with a minimum of RIM Modules and minimum investment without fighting de-sense RF issues.

MINI-PBX:

Using a combination of PSTN Modules and EXPM Modules creates a very flexible and powerful Mini-PBX. Examples include a 2-line, 14-station configuration and 4-line, 12-station configuration. By expanding to a 32 port ISD-3200, it can grow to a 4 line 28-station devise. By adding other modules, this Mini-PBX can be configured to by interoperable with conventional and trunking radio, cellular systems and SATCOM terminals.