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IRT Eurocard

Type DVC-4360

Composite to 270 Mb/s SDI Converter

Designed and manufactured in Australia

IRT can be found on the Internet at:
http://www.irtelectronics.com

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Instruction Book

Table of Contents

This instruction book applies to units later than S/N 0502001.

Operational Safety:

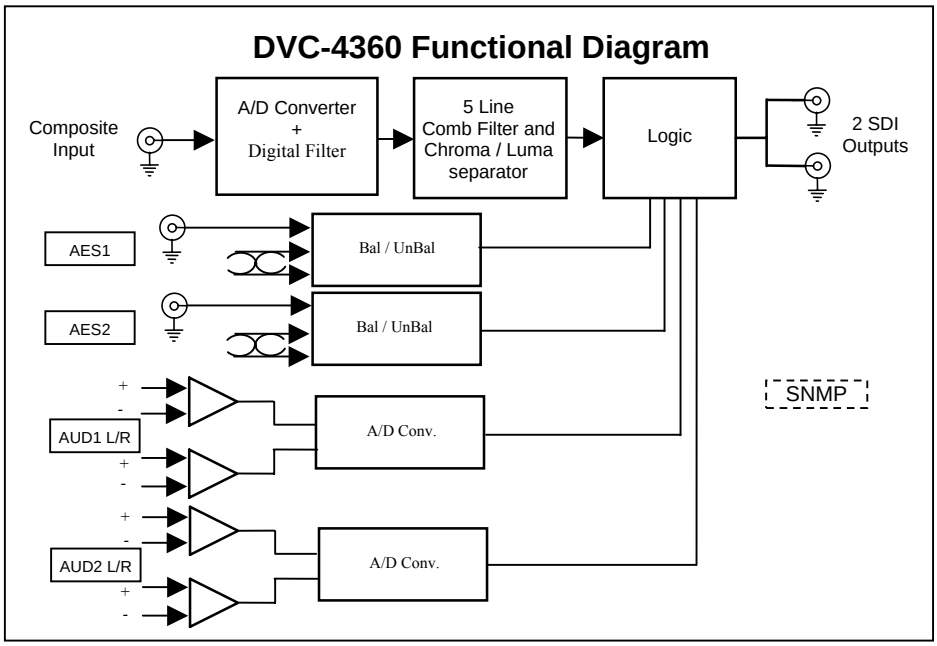
WARNING

Operation of electronic equipment involves the use of voltages and currents that may be dangerous to human life. Note that under certain conditions dangerous potentials may exist in some circuits when power controls are in the **OFF** position.
Maintenance personnel should observe all safety regulations.

Do not make any adjustments inside equipment with power **ON** unless proper precautions are observed. All internal adjustments should only be made by suitably qualified personnel. All operational adjustments are available externally without the need for removing covers or use of extender cards.

IRT Eurocard
Type DVC-4360
Composite to 270 Mb/s SDI
Converter

General Description



The DVC-4360 is a PAL / NTSC Composite to 270 Mbit/s serial digital (SDI) video converter, complete with Group 1 analogue or AES audio insertion.

The DVC-4360 provides two SDI outputs.

Audio channel allocation and source selection is provided by links on the main board.

The DVC-4360 is designed to provide Composite to SDI conversion using the latest digital filtering techniques. The DVC-4360 is also configurable for YP_bP_r or YC video inputs.

The Composite input section, shown in the block diagram above, automatically detects the Composite input standard (PAL or NTSC) and generates the appropriate 625 or 525 SDI format.

Link settings are provided for default output on signal loss. This is either blue or black in 625 or 525.

The DVC-4360 is designed to fit IRT's standard Eurocard frames as well as IRT's 4000 series frame for use with IRT's SNMP system and may be used alongside any other of IRT's analogue or digital Eurocards.

Features:

- **Configurable for Composite, YP_bP_r or YC video inputs.**
- **2 SDI 270 Mbit/s outputs.**
- **2 AES or 4 Analogue Audio Inputs.**
- **Group 1 - SMPTE 272M-A synchronous 48kHz audio insertion.**
- **PAL or NTSC operation with auto switching.**
- **Video input indicator on front panel.**
- **Simple Network Management Protocol (SNMP) capability.**

Technical Specifications

IRT Eurocard Module
DVC-4360

Input – Analogue Video:

Connector	1 x BNC.
Formats	1Vp-p Composite / YP_bP_r / YC
Impedance	75Ω

Input – Analogue Audio:

Connector	4 x Phoenix pluggable screw block.
Formats	Balanced
Impedance	10kΩ

Input – Digital Audio:

Connector	2 x Phoenix pluggable screw block.
Formats	Balanced AES
Impedance	110Ω
Connector	2 x BNC.
Formats	Unbalanced AES
Impedance	75Ω

Outputs - Digital:

Number	2.
Connectors	BNC.
Format	270 Mbit/s SDI (Serial CCIR601, 4:2:2) SMPTE 259M.
Signal Level	800 mV ±10%.

Outputs - Alarms:

Connectors	Polarised two-pin connector.
Format	Contact closure on loss of video or power.

Power Requirements:

Power requirements	28 Vac CT (14-0-14) or ± 16 Vdc.
Power consumption	7 VA.

Other:

Temperature range		0-50 ° C ambient
Mechanical		Suitable for mounting in IRT 19" rack chassis with input output and power connections on the rear panel
Finish:	Front panel	Grey background, silk-screened black lettering & red IRT logo
	Rear assembly	Detachable silk-screened PCB with direct mount connectors to Eurocard and external signals
Dimensions		32 mm x 3 U x 220 mm IRT Eurocard

Due to our policy of continuing development, these specifications are subject to change without notice.

Configuration

Link Settings:

Video Input	Link Settings	
	LK5	**LK6**
Composite	OUT	OUT
YP_bP_r	OUT	IN
YC	IN	OUT
SNMP Remote	IN	IN

Audio Input	Link Settings	
	LK7	**LK8**
Audio 1 + Audio 2	OUT	OUT
Audio 1 + AES 2	OUT	IN
AES 1 + Audio 2	IN	OUT
AES 1 + AES 2	IN	IN

Note: Audio 1 and Audio 2 are analogue audio inputs.
AES inputs are resampled before insertion into SDI O/P.

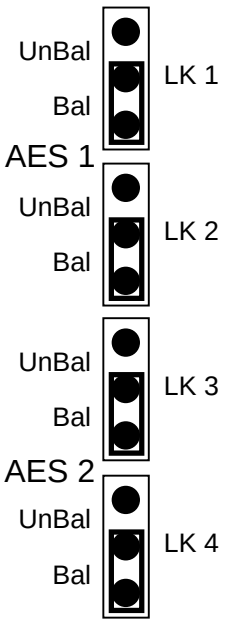
AES Inputs:

Balanced AES 1 — LK 1 – Bal, LK 2 – Bal *

UnBalanced AES 1 — LK 1 – UnBal, LK 2 – UnBal *

Balanced AES 2 — LK 3 – Bal, LK 4 – Bal *

UnBalanced AES 2 — LK 3 – UnBal, LK 4 – UnBal *



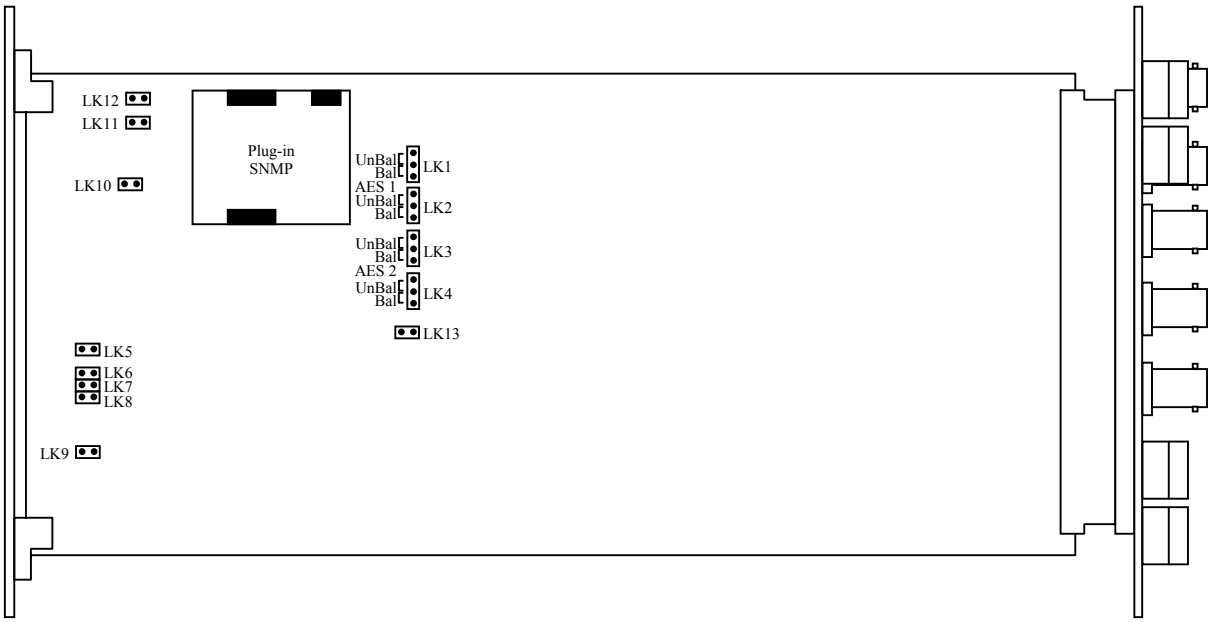
LK 9	IN	525 line test pattern on loss of input.
LK 9	OUT	625 line test pattern on loss of input.
LK 10	IN	Blue screen on loss of input.
LK 10	OUT	Black screen on loss of input.
LK 11		Not used.
LK 12		Not used.
LK 13	IN	Factory set – leave in.

Note: * Both links LK 1 and LK 2 must be set in tandem with each other, likewise for links LK3 & LK4.

With links LK7 and LK8 set for analogue audio input, corresponding front panel audio LED's will permanently be illuminated regardless of the presence of an input analogue audio signal or not.
With links LK7 and LK8 set for AES audio input, corresponding front panel audio LED's will illuminate on presence of AES audio input.

Location of links & user settings

The following location diagram is not to scale and is intended only to assist in finding the location of links and other settings, which may need to be changed by the user during *Configuration*.



SNMP

What Is It?

SNMP stands for Simple Network Management Protocol. It is an application layer protocol for managing IP (Internet Protocol) based systems. SNMP enables system administrators to manage system performance, and to find and solve system problems. SNMP runs over UDP (User Datagram Protocol), which in turn runs over IP.

Three types of SNMP exist: SNMP version 1 (SNMPv1), SNMP version 2 (SNMPv2) and SNMP version 3 (SNMPv3). It is not the intention here to discuss the differences between various versions, only to bring attention to the fact that IRT Electronics modules, fitted with SNMP capability, use SNMPv1.

An SNMP managed network consists of three key components: Network Management Systems (*NMS*), *agents*, and *managed devices*.

An *NMS* is the console through which the network administrator performs network management functions, such as monitoring status (e.g. alarm states) and remote controlling, of a set of managed devices. One or more *NMS*s must exist on any managed network. Generally the *NMS* is a computer running third party SNMP control software. There are a number of third party SNMP software applications currently available on the market.

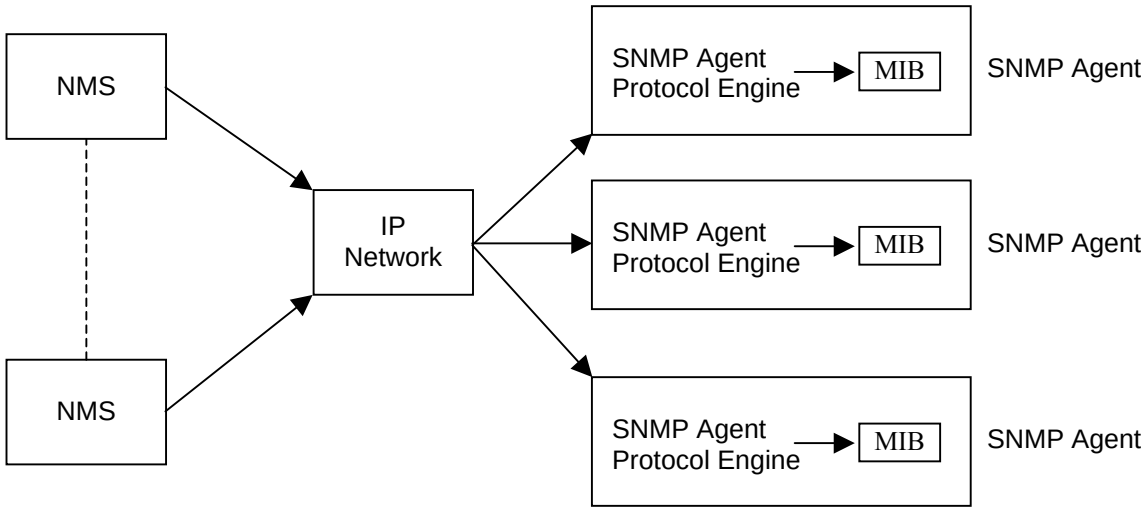
An *NMS* polls, or communicates with, an *agent*. An *agent* is a network management software module that resides in a *managed device*. An *agent* has local knowledge of management information and translates that information into a form compatible with SNMP. The *agent*, therefore, acts as an interface between the *NMS* and the managed devices. The *NMS* sends a request message, and control commands for the managed devices, to the *agent*, which in turn sends a response message, containing information about the *managed devices*, back to the *NMS*.

A *managed device* contains an SNMP *agent* and resides on a managed network. *Managed devices* collect and store management information and make this information available to *NMS*s using SNMP.

Managed device agent variables are organised in a tree structure known as a Management Information Base (*MIB*). Within the *MIB* are parameters pertaining to the *managed device*. An Object Identifier (OID) number within the *MIB* defines the managed device type. This is a unique number specific to the model of *managed device*. Other information relating to the device is also stored, information such as alarm states, controllable settings, etc. The *MIB* tree is organised in such a way that there will be no two *MIB* files with conflicting placements.

Normally an *NMS* polls an *agent* for information relating to the *MIB* in a managed device to be sent back to the *NMS*. When certain conditions are met within the *MIB*, such as major alarm conditions, for example, the *agent* automatically sends what is known as a *trap* to the *NMS* without any prompting from the *NMS*. This allows automatic notification of a predetermined event.

SNMP Block Diagram



SNMP with IRT Products

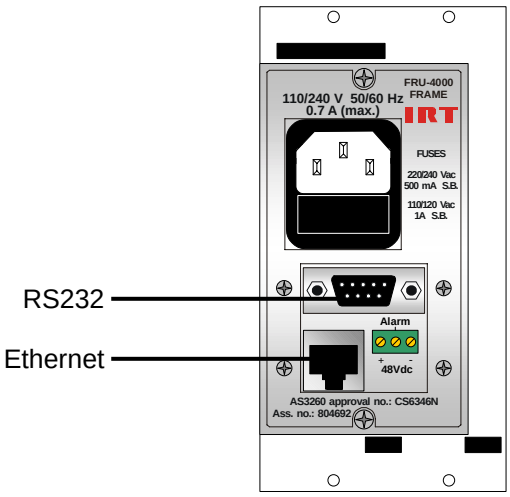
IRT Electronics currently employs SNMPv1 with its 4000 series frame. The frame acts as an *agent* when fitted with a CDM-4000 module. This module has its own designated slot next to the power supply so as to not affect the number of modules that the frame will take. Communication between the *NMS*, the frame and its loaded modules are via this CDM-4000 module. Note that the *NMS* software is third party and not supplied by IRT Electronics.

Ethernet connection for SNMP operation is via an RJ45 connector on the rear of the frame, below the mains inlet. Ethernet rate runs at either 10 baseT or 100 baseT.

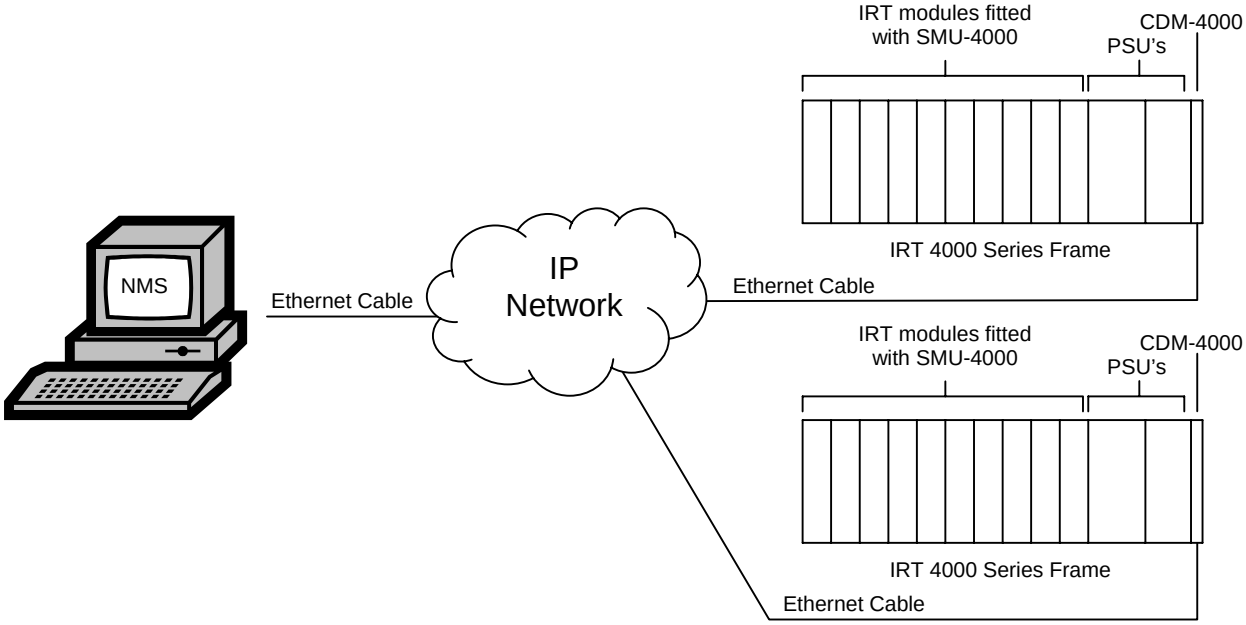
Frame parameters, such as Name, Address and Location, are set via an RS232 interface, a D9 connector on the rear of the frame below the mains inlet. A software terminal emulator, such as Tera Term or HyperTerminal, is used for setting and reading the parameters of the frame.

IRT modules that are SNMP compatible need a plug-in SMU-4000 module with a program relevant to the module that it is plugged into. Depending on the module, besides the module identification, parameters such as alarm states, inputs and controls etc. are communicated to the CDM-4000 *agent* via a data bus on the rear of the frame. Thus the CDM-4000 collects information on what is loaded within the frame, what positions they occupy, and their current status for communication to the *NMS* when the *NMS* sends a request for information.

In the event of a major alarm from any of the SNMP compatible modules, or power supplies, a *trap* is automatically sent by the CDM-4000 *agent* to the *NMS* without any prompting by the *NMS*. This alerts the operator to any fault conditions that may exist that need immediate attention.



IRT SNMP Connections



IRT 4000 Series SNMP Setup

DVC-4360 SNMP Functions:

With the DVC-4360 installed in an IRT 4000 series frame with SNMP capability, the DVC-4360 can be interrogated by an SNMP Network Management System (NMS).

The following SNMP functions are capable of being monitored by an NMS:

An indication that the video input is present and whether it is PAL or NTSC;
An indication of the current state of the Urgent Alarm;
An indication if remote setting by SNMP is allowed for the operating parameters;
An indication of the firmware version of the FPGA;
Trap automatically sent, if enabled, when an Urgent Alarm occurs;
Unit reset control.

Installation

Pre-installation:

Handling:

This equipment may contain or be connected to static sensitive devices and proper static free handling precautions should be observed.

Where individual circuit cards are stored, they should be placed in antistatic bags. Proper antistatic procedures should be followed when inserting or removing cards from these bags.

Power:

AC mains supply: Ensure that operating voltage of unit and local supply voltage match and that correct rating fuse is installed for local supply.

DC supply: Ensure that the correct polarity is observed and that DC supply voltage is maintained within the operating range specified.

Earthing:

The earth path is dependent on the type of frame selected. In every case particular care should be taken to ensure that the frame is connected to earth for safety reasons. See frame manual for details.

Signal earth: For safety reasons a connection is made between signal earth and chassis earth. No attempt should be made to break this connection.

Installation in frame or chassis:

See details in separate manual for selected frame type.

Analogue Video Connections:

The DVC-4360 takes a choice of Composite, YP_bP_r, or YC as its video input. Inputs are 75 Ω BNC type for connection with high quality 75 Ω coaxial cable and are self-terminating. No loop through facility is available.

Links LK5 and LK6 change the video input to Composite, YP_bP_r or YC. See *Configuration* section of this manual for link set-ups.

On detection of an input video signal, front panel video LED will illuminate.

Digital Video Connections:

SDI outputs are 75 Ω BNC type for connection with high quality 75 Ω coaxial cable.

Analogue Audio Connections:

Balanced analogue audio connections are by 3 pin phoenix style screw type connectors terminated in high impedance (10 kΩ) for connection with twisted pair shielded audio cable. Links LK7 and LK8 set the audio input combination for embedding of audio within the SDI output stream. See *Configuration* section of this manual.

With links LK7 and LK8 set for analogue audio, corresponding front panel audio LED's will permanently be illuminated regardless of the presence of an input analogue audio signal or not.

Digital Audio (AES) Connections:

The DVC-4360 can take either two balanced or unbalanced, or a combination of balanced and unbalanced, AES inputs. Both links LK1 and LK2 set the AES1 input for either balanced or unbalanced operation, whilst links LK3 and LK4 set the AES2 input for either balanced or unbalanced operation. Note that both LK1 and LK2, and likewise LK3 and LK4, must be set in tandem. Links LK7 and LK8 set the audio input combination for embedding of audio within the SDI output stream. See *Configuration* section of this manual.

The balanced AES inputs are by 3 pin phoenix style screw type connectors terminated in 110 Ω for connection with twisted pair shielded audio cable. The unbalanced AES inputs are 75 Ω BNC type for connection with high quality 75 Ω coaxial cable.

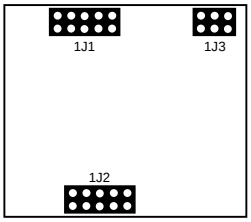
With links LK7 and LK8 set for AES mode, when an AES input is detected the corresponding audio front panel LED will illuminate. Note: corresponding audio LED's will permanently be illuminated when LK7 and LK8 is set for analogue audio mode.

Alarm Output Connection:

A normally open 2-pin connector is provided on the rear assembly for an alarm connection on loss of video input or loss of power. During an alarm condition, an on board relay contact shorts the 2-pin connector together.

SMU-4000 Installation

The SMU-4000 plug-in SNMP management controller module can only be fitted to IRT's 4000 series modules that are capable of being SNMP upgradeable. To determine whether a module is SNMP upgradeable, a square section on the main PCB is silk screened and fitted with three multipin sockets – as shown below:



This is where the SMU-4000 plug-in SNMP management controller module is fitted. The three sets of multipins on the underside of the SMU-4000 line up with the three sets of multipin sockets on the main PCB module. Align all pins and then gently press the SMU-4000 all the way down into place.

If the SMU-4000 is not already programmed with the correct firmware to match the module that it is being plugged into, it then needs to be programmed via the pins on the topside of the SMU-4000.

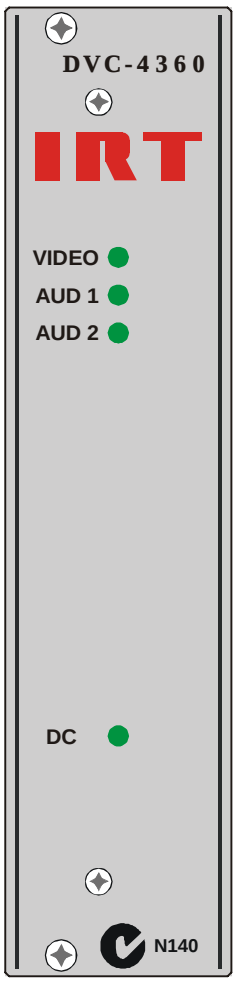
Note that installation will generally be done by IRT Electronics at the time of ordering.

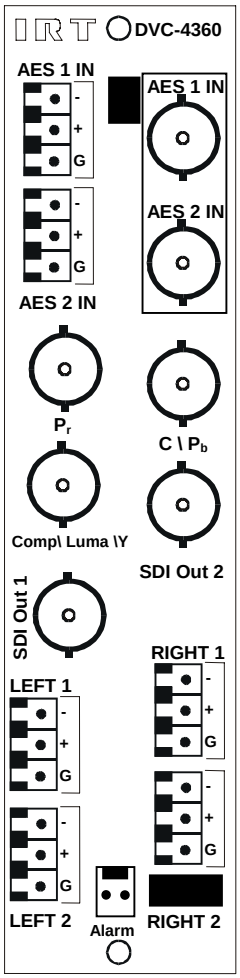
Note also that an SMU-4000 will only be functionally operational when the main module that it is plugged into is fitted into an IRT 4000 series frame fitted with a CDM-4000 SNMP agent and being interrogated by a suitable Network Management System.

Figure 1: SMU-4000 module

Front & rear panel connector diagrams

The following front panel and rear assembly drawings are not to scale and are intended to show relative positions of connectors, indicators and controls only.





Maintenance & storage

Maintenance:

No regular maintenance is required.

Care however should be taken to ensure that all connectors are kept clean and free from contamination of any kind. This is especially important in fibre optic equipment where cleanliness of optical connections is critical to performance.

Storage:

If the equipment is not to be used for an extended period, it is recommended the whole unit be placed in a sealed plastic bag to prevent dust contamination. In areas of high humidity a suitably sized bag of silica gel should be included to deter corrosion.

Where individual circuit cards are stored, they should be placed in antistatic bags. Proper antistatic procedures should be followed when inserting or removing cards from these bags.

Warranty & service

Equipment is covered by a limited warranty period of three years from date of first delivery unless contrary conditions apply under a particular contract of supply. For situations when "**No Fault Found**" for repairs, a minimum charge of 1 hour's labour, at IRT's current labour charge rate, will apply, whether the equipment is within the warranty period or not.

Equipment warranty is limited to faults attributable to defects in original design or manufacture. Warranty on components shall be extended by IRT only to the extent obtainable from the component supplier.

Equipment return:

Before arranging service, ensure that the fault is in the unit to be serviced and not in associated equipment. If possible, confirm this by substitution.

Before returning equipment contact should be made with IRT or your local agent to determine whether the equipment can be serviced in the field or should be returned for repair.

The equipment should be properly packed for return observing antistatic procedures.

The following information should accompany the unit to be returned:

1. A fault report should be included indicating the nature of the fault
2. The operating conditions under which the fault initially occurred.
3. Any additional information, which may be of assistance in fault location and remedy.
4. A contact name and telephone and fax numbers.
5. Details of payment method for items not covered by warranty.
6. Full return address.
7. For situations when "**No Fault Found**" for repairs, a minimum charge of 1 hour's labour will apply, whether the equipment is within the warranty period or not. Contact IRT for current hourly rate.

Please note that all freight charges are the responsibility of the customer.

The equipment should be returned **to the agent who originally supplied the equipment or, where this is not possible**, to IRT direct as follows.

Equipment Service
IRT Electronics Pty Ltd
26 Hotham Parade
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N.S.W. 2064
AUSTRALIA

Phone: 61 2 9439 3744 Fax: 61 2 9439 7439
Email: service@irtelectronics.com