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IRT 4000 Series Eurocard Frame with SNMP Control & Power Supplies

Types FRU-4000
PSU-4000
CDM-4000
SMU-4000

Designed and manufactured in Australia

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

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This instruction book applies to units later than S/N 0306001.

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.

WARNING

AC POWER SUPPLIES

Whilst every effort has been made to prevent exposure of service personnel to dangerous voltages, AC mains input power supplies are by their nature dangerous when connected to the AC mains supply.

Wherever possible maintenance work on power supplies should be carried out with the mains input disconnected - NOT just switched off.

When testing units with the mains supply ON, the supply should be connected through an earth leakage circuit breaker and should not be done without another person in attendance.

IRT Eurocard Frame

Type FRU-4000

General Description

The purpose of the FRU-4000 is to provide an economical and compact mechanical framing system for IRT Eurocards. The FRU-4000 comes equipped with a single AC power supply as standard. Provision is made for the addition of a second supply for redundancy if required.

Each supply is capable of supplying 50 VA of power continuously or 80 VA of power for a short period with reduced mains voltage variations. Most IRT modules require less than 5 VA each.

A total of 12 standard IRT Eurocards can be accommodated in one standard IRT FRU-4000 3 Rack Unit Frame. With a second power supply fitted the number of Eurocards reduces to 10.

The FRU-4000 frame also has provision for the addition of a Simple Network Management Protocol (SNMP) card, the CDM-4000, to act as an "Agent" when used with a third party Network Management System (not supplied). This card has its own slot position and does not affect the number of modules that can be installed in the frame.

In order for SNMP to be effective, as well as having a CDM-4000 Agent card installed, the installed modules must themselves be fitted with the optional SMU-4000 plug in board programmed with its relevant Management Information Base (MIB).

The frame provides a power supply bus to reticulate power from one or two common low voltage power supply units to all cards in the frame. It also provides a data bus for SNMP control when the frame is fitted with a CDM4000 SNMP Agent card (sold separately). Ethernet connection is via an RJ45 connector on the rear of the standard supplied power supply rear assembly.

IRT Eurocard products are supplied in two parts; an *electronics module* complete with front fascia panel and *a rear assembly*, which provides the necessary connections to other equipment.

The *electronics module* and *rear assembly* are fitted with multipin mating connectors allowing them to be connected directly together.

The *rear assembly* is screwed to the rear of the frame with pins mating to the frame's power supply bus and SNMP control bus.

The *electronics module* can be inserted or removed from the frame from the front. When inserted it mates directly with the *rear assembly*.

This method generally allows the *electronics module* to be inserted or removed without disturbing any wiring connected to the *rear assembly*. (In the case of particular modules, such as optical fibre modules, special connections may either prevent this or require special care. Please consult installation instructions for particular modules for details).

An extender card may be used to allow servicing of the module whilst it remains connected to the frame, except in the case of SNMP operation.

The FRU-4000 frame will take all IRT 4000 series Eurocards. Some 3000 series Eurocards that have the correct type of power connector on the rear assembly can also be fitted to the FRU-4000 frame. Contact IRT Electronics for a current listing of compatible modules. All 4000 series Eurocards are backwards compatible with IRT's 1000 and 3000 series frames.

Technical Specifications

IRT Eurocard Frame
Type FRU-4000

Power:

Note: FRU-4000 comes standard with 1 PSU-4000 AC power supply already installed.

Input power:	AC	AC mains input (110 Vac, 130 Vac, 220 Vac or 240 Vac ±10%)
		and / or
	DC (future)	-48 Vdc ± 25% (if DC power supply installed)
Input power fuses	AC	SLO-BLO 500 mA for 240 Vac
		SLO-BLO 1000 mA for 110 Vac
	DC (future)	Fused in -48 Vdc PSU module.
Output power to module bus:	AC	28 Vac CT (14-0-14) from PSU-4000
		and / or
	DC(future)	± 16 Vdc from -48 Vdc PSU module.

Connectors:

Module rear assembly to frame	Power	CLT105-02FDBE-A 10 pin SMD connector, bottom entry.
	SNMP	CLT103-02FDBE-A 6 pin SMD connector, bottom entry.
SNMP control		RJ45 Ethernet connector.
SNMP Agent RS232		9 pin female D connector.
Power module to frame		H15FP4 H15 female 4 mm PCB mounting.
Power input to frame	AC	IEC 320 with integral fuse holder.
	DC (future)	3-pin termination block.
Alarm output		Centre pin of DC supply input 3-pin termination block.

Other:

Temperature range	0 - 50° C ambient.
Mechanical	3 RU (482 mm x 132 mm) standard 19” rack frame. Suitable for mounting in standard 19" racks.
Finish:	Natural anodised aluminium frame with passivated steel rear power connection box with black silk-screened lettering.
Dimensions	482 x 132 x 253 mm (Frame empty.) Clearance width 445 mm
Optional accessories	TME-6 module extender card for Eurocard modules. PSU-4000 voltage selectable power supply module. CDM-4000 SNMP Agent module. SMU-4000 SNMP plug-in MIB board for modules housed in frame.

Circuit Description

The FRU-4000 frame can distribute to each module two low voltage centre tapped power supplies. One supply is from the power supply supplied as standard in slots 13 and 14. the other supply can be optionally fitted into slots 11 and 12. The use of two supplies gives complete power supply redundancy. When a frame is fitted with two supplies any one supply can be temporarily removed without causing interruptions.

Normally the supplies would be PSU-4000 AC supplies but can optionally be PSU-4xxx DC supplies (future – DC power supply number still to be decided as of writing this handbook). When PSU-4000 AC power supplies are used, the two supplies distributed are both 28VAC, centre tapped. When two PSU-4xxx DC power supplies are used, the two supplies are each + and – 16VDC. All IRT modules will operate with either of these supplies.

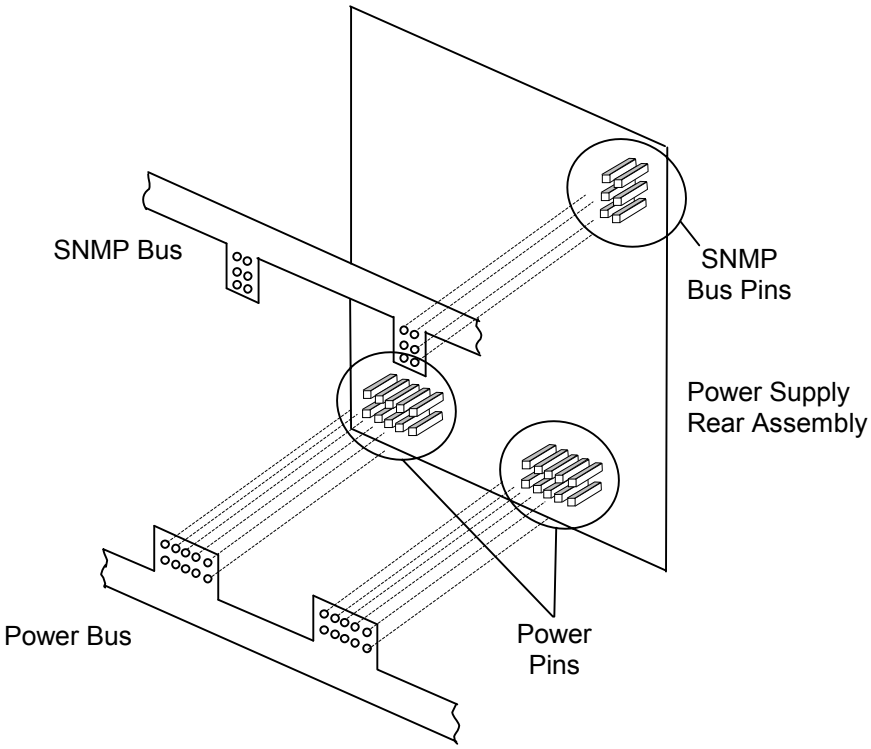
Failure of each supply is reported to the CDM-4000 SNMP module. This module, in addition to raising an SNMP trap, will indicate the failure by switching a relay to ground. This contact is available on the centre pin (labelled Alarm) of a three pin connector on the rear of the frame.

Installation

2nd PSU-4000 Power Supply Module

If power supply redundancy is required a second PSU-4000 power supply module can be fitted next to the existing standard supplied power supply.

Install the PSU-4000 rear assembly next to the existing standard power supply rear assembly on the back of the frame. Power pins and SNMP bus pins must align with the power and SNMP bus rails on the rear of the frame. Power pins from the power supplies feed the power bus to power the Eurocard modules fitted into the frame. The SNMP bus connects the optional SNMP circuitry of the fitted Eurocards to the CDM-4000 SNMP agent (if installed). Install the four retaining screws (Metric M2.5 x 10 mm).



The PSU-4000 power supply slides in from the front of the frame via guides in the Eurocard position 11 slot. Tighten the 4 front panel retaining screws. A narrow width blank panel is supplied with the PSU-4000 module to fill in the space between the two power supply modules.

Connect power input to rear of frame. If a DC supply is installed, for DC input, observe the polarity markings next to each connector.

CDM-4000 SNMP Agent Module

If the FRU-4000 frame is to be fitted with SNMP capability, then the CDM-4000 SNMP Agent module needs to be installed.

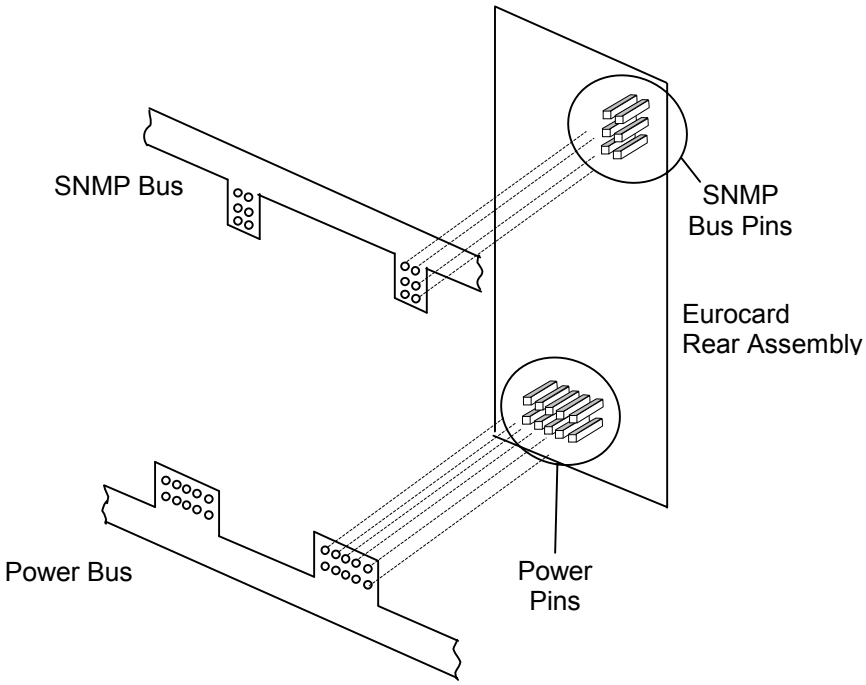
Looking at the front view of the FRU-4000 frame, to the right of the power supply that comes pre-installed in the frame, there is a narrow width blank panel. Remove this blank panel and slide the CDM-4000 module into the guides behind all the way until the module mates with the 64 pin connector at the rear of the frame, then tighten the two front retaining screws.

Signal connections to this card are via the rear of the frame below the IEC mains plug input. The 9 pin female D9 connector is an RS-232 interface for connection to a computer for initial setup parameters of the frame for SNMP use. The RJ45 connector is for Ethernet connection.

Eurocard Module

In order for an IRT Eurocard to be mounted within the FRU-4000 frame, the rear assembly must be fitted with power pins to pick up power from the frame power bus. All IRT 4000 series cards come fitted with these pins and are fully compatible with the FRU-4000 frame. Only some 3000 series Eurocard modules are compatible with the FRU-4000 series frame. Contact IRT Electronics for information on compatible units.

Ensure that the rear assembly has the correct orientation and carefully align the power pins and SNMP pins over power and SNMP bus connectors. With equal pressure to the top and bottom of the rear assembly, press until the rear assembly PCB touches the frame mounting rails at the top and bottom. Install the two retaining screws (Metric M2.5 x 10 mm).



Rear assemblies may be removed for maintenance. Make sure that extraction force is applied equally and steadily at the top and bottom of the rear assembly simultaneously.

If extraction force is not equally applied, there is a good chance that the module connector pins will be bent, making it very difficult to re-install the rear assembly.

Slide the Eurocard module into the front of the frame in the guides corresponding to the position of the installed mating rear assembly until it makes mating contact with the rear assembly 64 pin connector, then tighten the two front retaining screws.

Warning

Optical Connections

The optical connectors on modules may be attached to the main module PCB, NOT the rear connector assembly.

When installing the optical fibre sufficient slack should be allowed for the module to be withdrawn with the optical fibre attached until the connector is clear of the frame and can be disconnected.

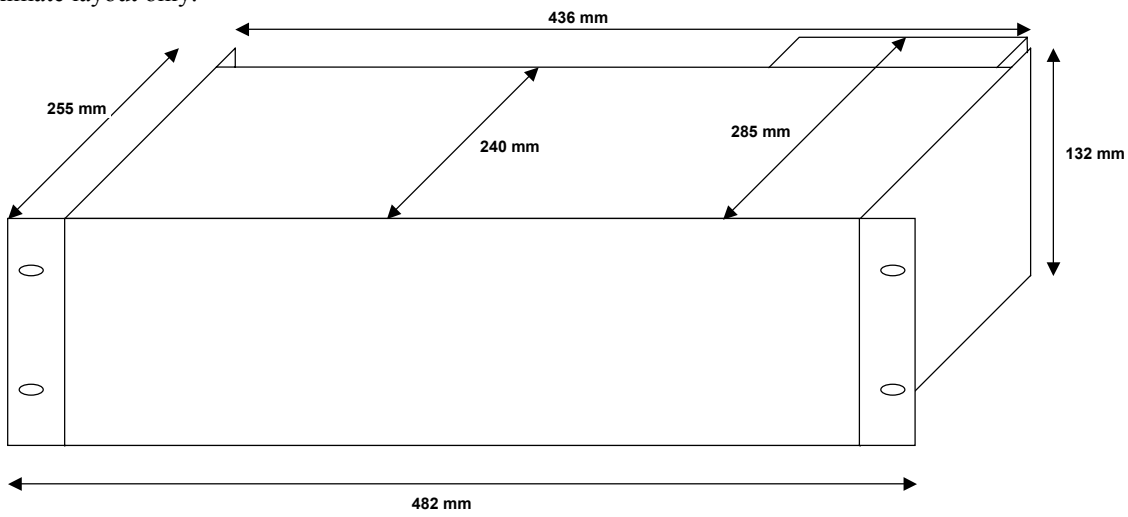
If this is not done, the module will not be able to be removed without first disconnecting the optical fibre at the rear. Attempting to remove the module without first disconnecting the fibre may result in damage to the fibre and / or the module.

EMC

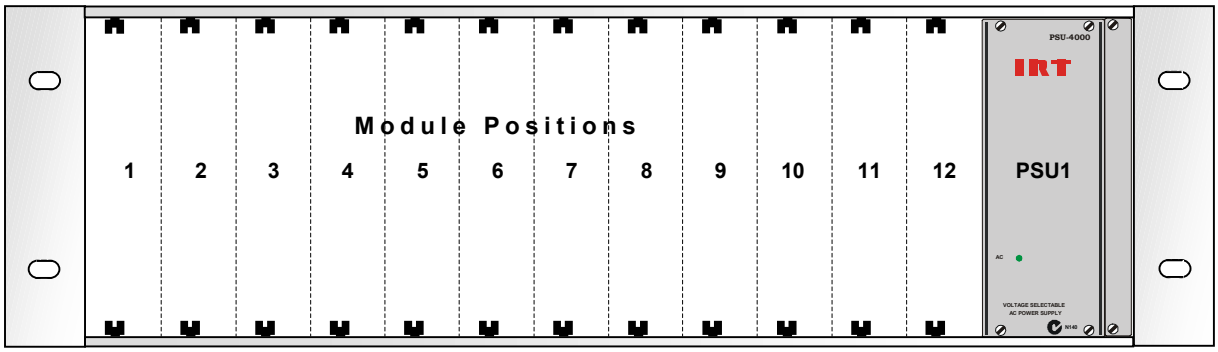
Due to EMC (electromagnetic compliance) standards, IRT recommends that all unused card positions be closed off using IRT front blanking panels, on the front, and rear blanking panels, on the rear, of the frame.

Front & rear location diagrams

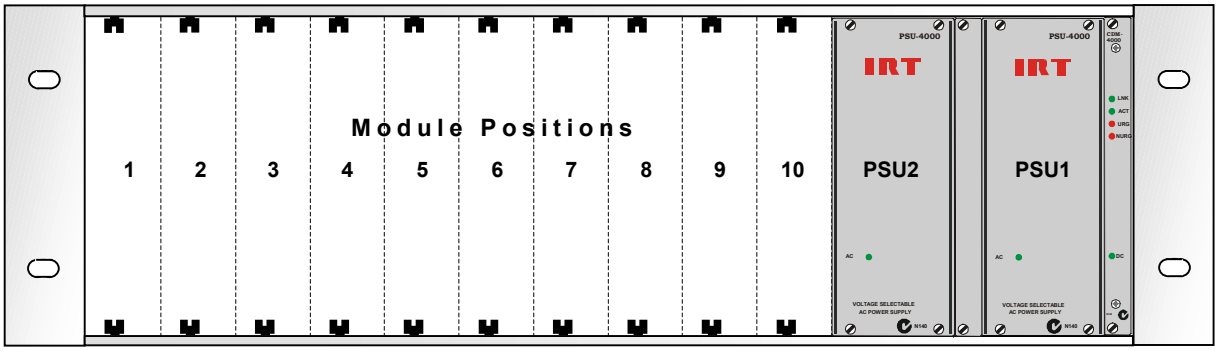
The following front panel and rear assembly drawings are not to scale and are intended to show connection order and approximate layout only.



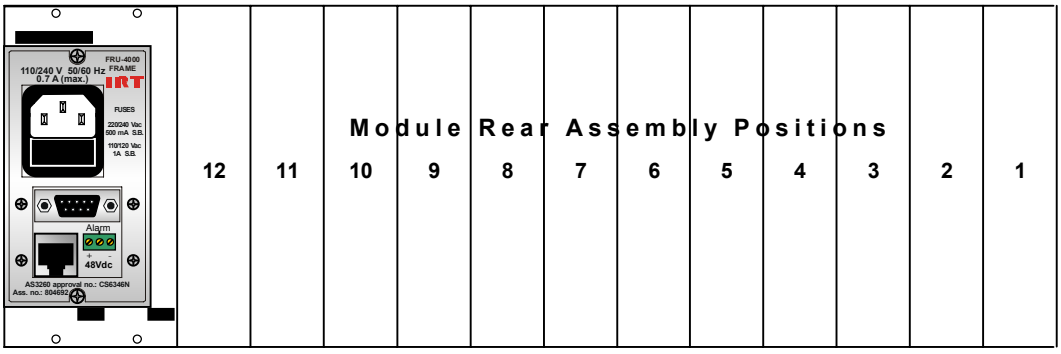
FRU-4000 (Standard) - Front View



FRU-4000 with 2nd PSU and CDM-4000 “SNMP Agent” card fitted - Front View



FRU-4000 (Standard) - Rear View



IRT Power Supply for Eurocard

Type PSU-4000

General Description

The PSU-4000 is designed to provide the low voltage AC power required for operation of up to 12 standard IRT Eurocard modules fitted within an IRT 4000 series frame. The PSU-4000 adds the facility of providing for selection of the AC mains input voltage by way of a selector switch on the side of the PSU.

Two PSU-4000's can be operated redundantly when using an IRT 4000 series frame. The redundant power supply facility of the PSU-4000 is enabled in each IRT Eurocard module by having the power supply circuit of each module made up of two bridge rectifier circuits with the outputs connected in parallel. This allows the 28 Vac CT voltages to be sourced from either PSU-4000.

A front panel LED indicator provides visual confirmation of the presence of the low voltage output.

An alarm relay is also included which will activate the alarm in the CDM-4000 module if either side of the AC output fails.

A voltage selector switch allows the PSU-4000 to be configured for 240V, 220V, 130V or 110V operation.

Technical Specifications
IRT Eurocard Dual Power Supply Module
Type PSU-4000

Power Requirements:

Voltage	240 Vac ± 10% 220 Vac ± 10% 130 Vac ± 10% 110 Vac ± 10%
Frequency	50 - 60 Hz ±10%
Fusing	500 mA anti-surge for 240V and 220V operation, 1000 mA anti-surge for 130V and 110V operation. Fuses are installed in the associated rear assembly.

Standards Approval: AS3260 approval no.: CS6346N

Output: 28 Vac centre tapped (14 - 0 - 14) fully loaded.
50 VA maximum.

Connectors: AC power input / AC output H15MFAV32 male, Faston

Other:

Temperature range		0 - 50° C ambient
Mechanical		Suitable for mounting in FRU-4000 rack frame
Finish:	Front panel	Grey background, black lettering & red IRT logo
	Body	Passivated steel with silk-screened black lettering.
Dimensions		6 HP x 3 U x 230 mm

Circuit Description

The PSU-4000 consists of a power transformer, which provides a 28 Vac centre tapped output.

All connections to the module are made via a single multipin connector. Extreme care should be taken when working in the vicinity of this connector as it carries the live mains input voltage.

The front panel LED power indicator is supplied from the output with the full 28 Vac via a rectifier diode and series resistor.

The alarm relay is powered from the output rails, in parallel with the LED indicator, by way of a series 20 Volt zener diode. Thus if either rail fails there is insufficient voltage to operate the relay and the alarm will indicate the fault condition. A capacitor is provided across the DC relay supply to prevent relay chatter.

When operating normally the alarm is open circuit. When supply is lost the alarm line is grounded.

Pre-Installation:

Handling:

This equipment may be connected to static sensitive devices and proper static free handling precautions should be observed when disconnecting or reconnecting either the input or the output of the PSU.

Power:

Set the Voltage selector switch for the correct input Mains voltage. Ensure that the correct fuses are installed in the associated rear assembly – 1000 mA anti-surge for 130 and 110V and 500 mA anti-surge for 220 and 240V operation.

Earthing:

Supply earth:

For safety reasons a connection is made between the IEC connector earth pin and the IRT 4000 series chassis. No attempt should be made to break this earth connection.

When the PSU-4000 is installed in the IRT 4000 series frame a connection will be made between the above earth and the PSU-4000 chassis.

Power supply output earth:

No connection is made between the centre tap of the PSU-4000 low voltage output and the chassis frame.

Signal earth:

4000 series frame:

The signal earth of all IRT modules is connected to the chassis frame.

PSU-4000 Installation

The PSU-4000 contains no user serviceable parts inside and should not be opened.

In the event of failure of the supply, the input operating voltage and IEC input connector fuse should be checked.

If fault persists the complete unit should be returned to IRT or your local agent for service.

Performance:

One PSU-4000 is designed to provide adequate power for an IRT 4000 series frame equipped with its maximum of twelve Eurocard modules under normal conditions. During normal operation, this power is shared between the two supplies mounted in the frame.

This performance is contingent on two power supplies being operational and the AC mains supply input being within the specified range.

Where both an AC and DC supply are fitted in the one frame, the degree of load sharing will be dependent on the AC input voltage to the PSU-4000. This will directly affect its output voltage whereas the DC supply will continue to supply a constant voltage output over a wide range of input voltages.

If only one supply is operational or the AC supply voltage to one supply is low, module performance may be affected.

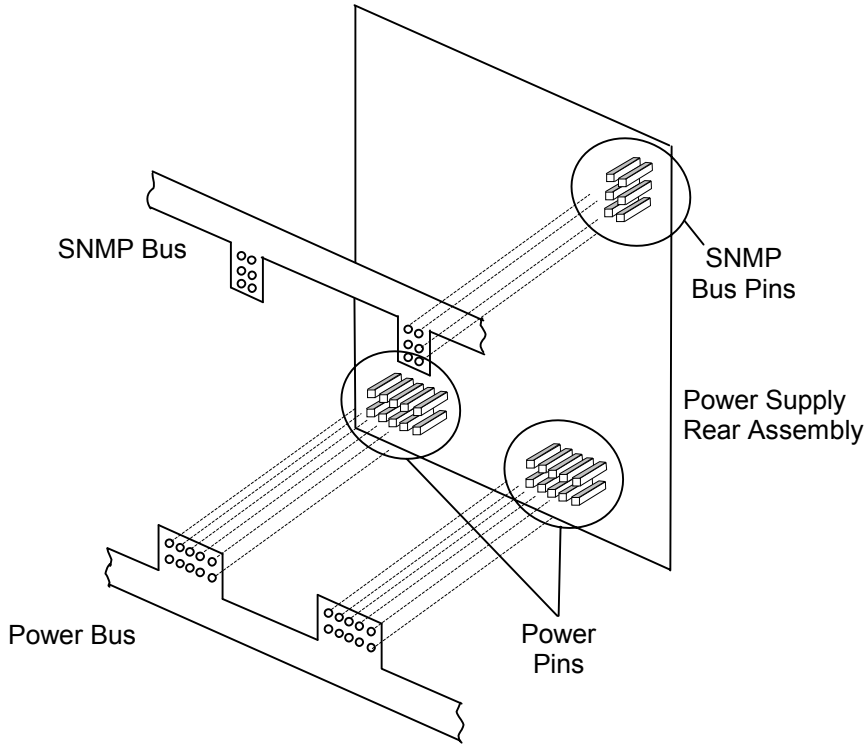
The provision of two power supplies is intended to provide continued operation, during failure of one supply, until the second supply can be restored.

If the AC mains supply input is subject to wide fluctuation, a suitable stabilised source should be installed.

IRT 4000 Series Frame:

The IRT 4000 series frame comes equipped with a PSU-4000 power supply as standard. If power supply redundancy is required a second PSU-4000 power supply module can be fitted next to the existing standard supplied power supply.

Install the PSU-4000 rear assembly next to the existing standard power supply rear assembly on the back of the frame. Power pins and SNMP bus pins must align with the power and SNMP bus rails on the rear of the frame. Power pins from the power supplies feed the power bus to power the Eurocard modules fitted into the frame. The SNMP bus connects the optional SNMP circuitry of the fitted Eurocards to the CDM-4000 SNMP agent. Install the four retaining screws (Metric M2.5 x 10 mm).



The PSU-4000 power supply slides in from the front of the frame via guides in the Eurocard position 11 slot. Tighten the 4 front panel retaining screws. A narrow width blank panel is supplied with the PSU-4000 module to fill in the space between the two power supply modules.

Power to the PSU-4000 is supplied from an IEC320 mains connector located on its rear assembly.

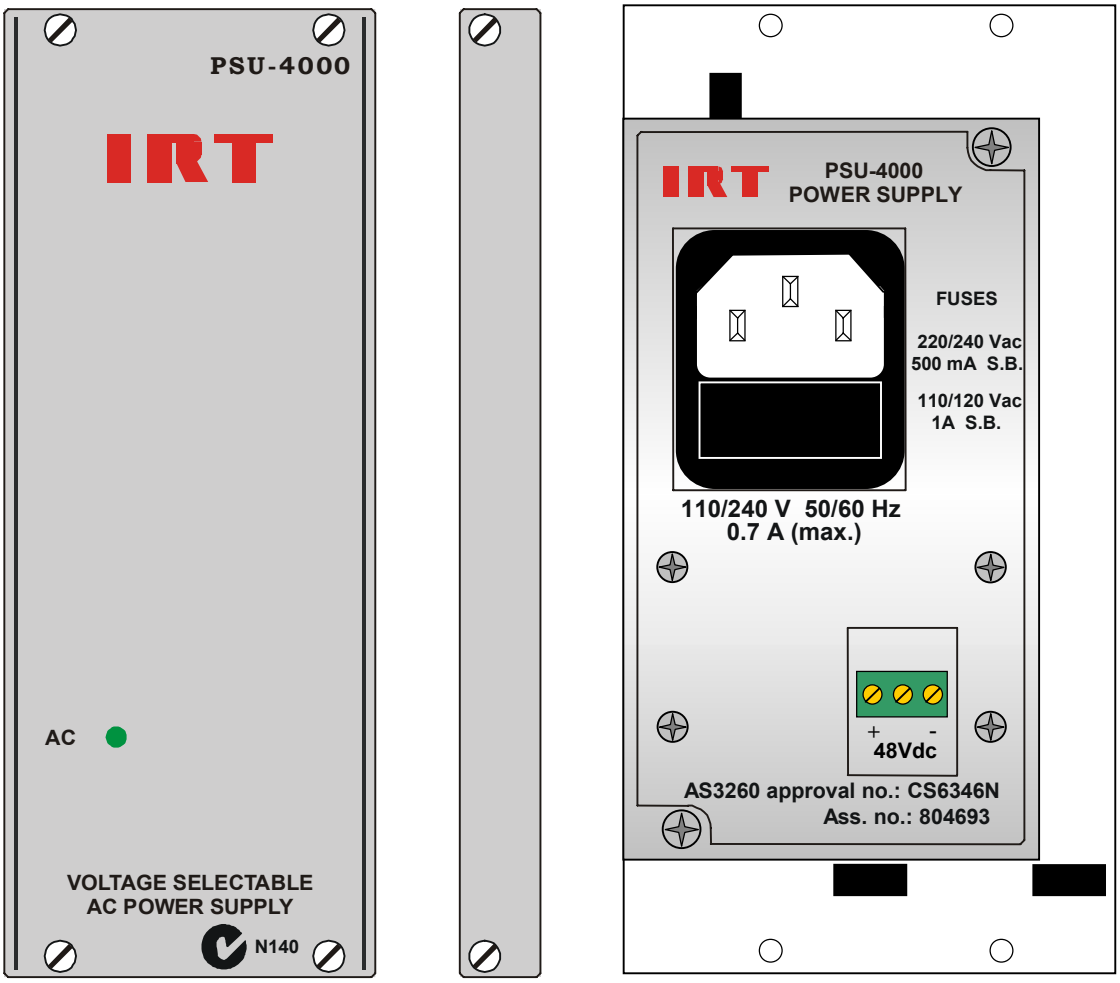
Note that the IEC320 connectors have inbuilt fuses. A spare fuse may also be stored inside the connector. The fuse should 1000 mA anti-surge for 130 and 110V operation and 500 mA anti-surge for 240 and 220V operation.

The alarm output connector is located on the rear of the 4000 series frame and is common to both supply units when installed. The alarms for both units are in parallel such that when a fault develops in either PSU the alarm output will be grounded.

Due to its weight the PSU-4000 can be damaged itself or cause damage to the frame if subjected to a large mechanical shock.

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.



Front Panel Filler Panel Rear Assembly

SNMP Agent
Frame Controller
Type CDM-4000

General Description

The CDM-4000 is a Simple Network Management Protocol (SNMP) Agent for use in IRT's 4000 series frames. It occupies its own designated slot within the frame, next to the power supply, so it does not affect the number of modules that can be used within the frame.

The CDM-4000 can communicate with all modules in a Frame that are fitted with an SMU-4000 SNMP Interface sub-board, or have inbuilt SNMP facilities. The information obtained is forwarded via an Ethernet connection to any SNMP Network Management System (NMS) whose address is configured in the CDM-4000.

The CDM-4000 holds parameters such as Frame Name, Address and Location. This information may be set via an RS232 Configuration port.

The NMS third party software (not supplied by IRT) polls the CDM-4000 to remotely monitor and control the frame and its SNMP capable modules.

In the event of a major alarm from any of the modules or power supply an alarm condition, known as a Trap, is automatically sent without any prompting from the NMS.

Front panel LEDs indicate the presence of an Ethernet link, link activity and the Frame urgent & non-urgent alarm states.

Ethernet connection is via an RJ45 connector and the RS232 is via a D9 female connector on the rear of the frame. Modules that are being monitored and controlled share a common data bus on the frame.

SNMP monitoring and control finds particular use in remote or unmanned locations such as transmitter sites, or where control via a computer is desired.

As the CDM-4000 can be assigned its own IP Address, multiple sites can be monitored and controlled via the one NMS. Alternatively, multiple NMS's in different locations can be used to monitor and control the same site.

Features:

- **SNMP remote monitoring and control via Ethernet connection**
- **Automatic "Trap" transmission on major alarms**
- **Front panel LED indicators**
- **Own designated slot in 4000 series frame**

CDM-4000 Technical Specifications

Ethernet:

Rate	100baseT\ 10 baseT.
Connector	RJ45 (on rear of 4000 series frame).

RS232:

Rate	9600 baud
Connector	Female D9 (on rear of 4000 series frame)

SNMP:

Version	1
Configurable settings	SysDescr sysObjectID sysContact sysName sysLocation Agent IP address NMS IP address (max 5) Community Agent port number Trap port number

Front Panel Indicators:

LINK	(Green)	- Ethernet present
ACT	(Green)	- Activity, Ethernet communication
URG	(Red)	- Urgent Alarm detected
NURG	(Red)	- Non urgent Alarm detected
DC	(Green)	- Power present

Power Requirements	28 Vac CT (14-0-14) or ± 16 Vdc.
Power consumption	<5 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, black lettering.
	Rear assembly	Part of 4000 series frame.
Dimensions		2 HP x 3 U x 220 mm IRT Eurocard

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

CDM-4000 Installation

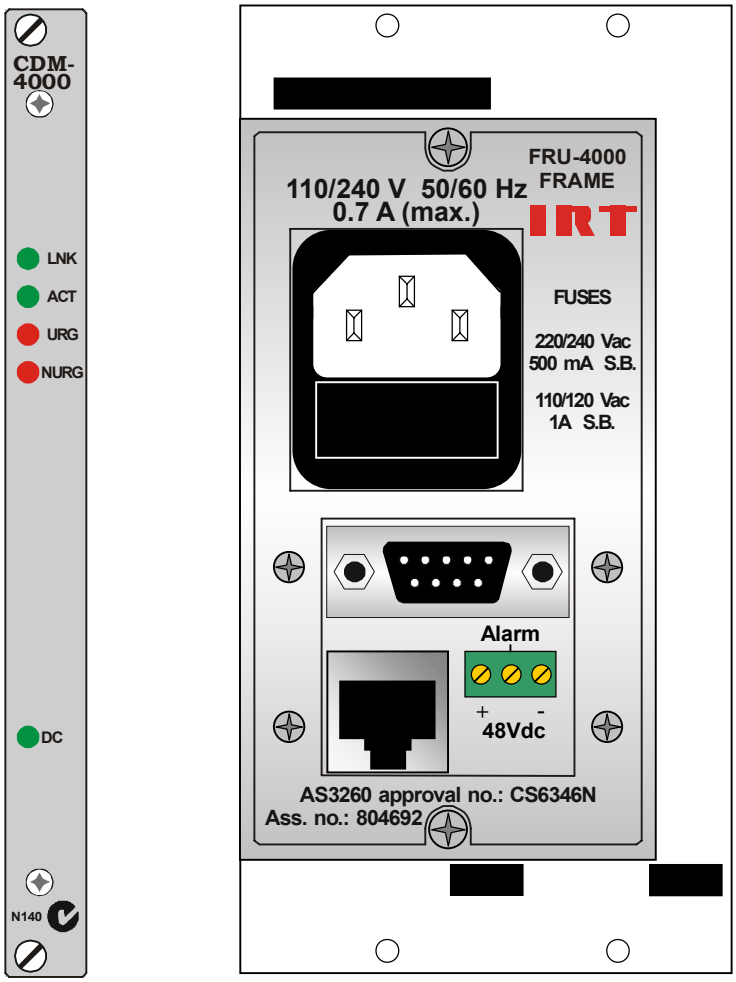
If the FRU-4000 frame is to be fitted with SNMP capability, then the CDM-4000 SNMP Agent module needs to be installed.

Looking at the front view of the FRU-4000 frame, to the right of the power supply that comes pre-installed in the frame, there is a narrow width blank panel. Remove this blank panel and slide the CDM-4000 module into the guides behind all the way until the module mates with the 64-pin connector at the rear of the frame, then tighten the two front retaining screws.

Signal connections to this card are via the rear of the frame below the IEC mains plug input. The 9 pin female D9 connector is an RS-232 interface for connection to a computer for initial setup parameters of the frame for SNMP use. The RJ45 connector is for Ethernet connection.

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.



CDM-4000 Setup

The communication between the CDM-4000 and the NMSs use Ethernet at either 10 or 100Mb/s.

The SNMP protocol used is Version 1. Read and Write functions use the same Community string.

To obtain a response from a CDM-4000 the Internet Protocol (IP) Destination address must be the preconfigured Local IP Address, the IP Source Address must be one of the pre-configured NMS addresses, the UDP Port number must match the preconfigured Agent Port, and the Community string must match the pre-configured Community string.

The Community string is also used to address individual modules. The frame slots are numbered from 1 to 9 then A to C (case sensitive) (giving 12 in all). To address a module the first character of the Community string must be the module Slot number in ASCII. The second character must be "@". The remaining characters must match the pre-configured Community string. For example suppose the Community was set as "public" then the module in Slot 1 would respond to "1@public" The CDM-4000 can also be addressed as being in slot '0' (i.e. "0@public" or "public").

To configure the CDM-4000 connect an ASCII serial RS-232 terminal (such as Tera Term PRO) to the Configuration port. The data rate should be 9600 baud and the byte should 8 bits data, no parity 1 stop. Upon sending 'Enter' you would typically see the following for modules with software lower than V1.5:

1.Local MAC address 12:34:56:78:9A:DF
2.Local IP address 192.168.0.100
3.NMS 1 IP Address 192.168.0.11 00:A0:CC:54:12:84
4.NMS 2 IP Address 255.255.255.255
5.NMS 3 IP Address 192.168.0.10 00:A0:CC:54:12:8E
6.NMS 4 IP Address 192.168.0.24 00:A0:CC:54:12:86
7.NMS 5 IP Address 192.168.0.9 00:09:5B:04:16:48
8.Community public
9.Agent Port 161
a.Trap Port 162
b.sysContact John Doe
c.sysLocation Hotham Pde
d.sysName north side

and for software V1.5 and higher:

1.Local MAC address 12:34:56:78:9A:DF
2.Local IP address 192.168.0.100
3.NMS 1 IP Address 192.168.0.11 00:A0:CC:54:12:84
4.NMS 2 IP Address 255.255.255.255
5.NMS 3 IP Address 192.168.0.10 00:A0:CC:54:12:8E
6.NMS 4 IP Address 192.168.0.24 00:A0:CC:54:12:86
7.NMS 5 IP Address 192.168.0.9 00:09:5B:04:16:48
8.Gateway IP Address 192.168.0.1 00:09:5B:12:33:15
9. Subnet Mask 0.0.0.0
A.Community public
B.Agent Port 161
C.Trap Port 162
D.sysContact John Doe
E.sysLocation Hotham Pde
F.sysName north side

Local MAC address

This is a unique address of this particular CDM-4000 and should only be changed with great care.

Local IP address

This is the static IP address assigned to the Frame by you or your ISP.

NMS 1 IP Address

This is the IP address of one of the NMSs to which the CDM-4000 will respond. Up to 5 addresses can be used. If any one of the addresses is not required then the address 255.255.255.255 should be entered.

Once communication has been established with a particular address then the MAC address used to communicate with that IP address will be displayed after the IP address. If the IP address is not within the local subnet as defined by the Gateway address and the Subnet Mask then instead of the MAC address the label "via Gateway" will appear.

Gateway IP Address

When using subnets a Gateway is the IP address of the computer appointed to pass on all messages that are not addressed to computers that are not part of your subnet. **The Gateway IP address must be in your subnet**.

Subnet Mask

A subnet mask is used to determine if an IP address is within your subnet or not. If the IP address is within your subnet then you send messages directly to that IP address. If it is not then you send messages to the Gateway for it to pass on.
Say the mask was 255.255.0.0 – and the destination IP address was 192.168.0.54 and the Gateway address was 192.168.0.1. Using binary logic you AND the IP address and the mask which results in 192.168.0.0 . Now AND the mask and the Gateway address and you get 192.168.0.0 . These two addresses match so the destination is in your local subnet.
If you do not want to use Gateways set the Mask to 0.0.0.0

Community

This is the Community string, which must be exactly matched for a response to be obtained. It is case sensitive and you may use non-printable characters. The maximum length is 63.

Agent Port

This is the Agents UDP Port number. SNMP Protocol suggests that this should be 161.

Trap Port

When a Trap (an unsolicited message from a module to a NMS) is sent the Trap Port number is used as the destination port. SNMP Protocol suggests that this should be 162. Note that when a module generates a trap, it is sent to all of the configured NMS addresses using this Port number.

sysContact

This string is sent when a 'Get sysContact' is sent to the CDM-4000. Maximum length is 63 and only printable characters should be used.

sysLocation

This string is sent when a 'Get sysLocation' is sent to the CDM-4000. Maximum length is 63 and only printable characters should be used.

sysName

This string is sent when a 'Get sysName' is sent to the CDM-4000. Maximum length is 63 and only printable characters should be used.

IRT-MIB.my is an SNMP MIB, which contains the Object Identifier (OID) definitions of all IRT controllable modules. It also contains a small number of OIDs used by modules that do not have their own MIB.
IRT4000FRU-MIB.my is an SNMP MIB specifically for the CDM/FRU-4000. A 'Walk' command to a CDM-4000 will show (in part) a list by slot number of the type of module installed.

The CDM-4000 will issue a Trap on failure of either of the two possible PSU-4000 PSUs in the frame.

SNMP Plug-in
Management Controller
Type SMU-4000

SMU-4000 General Description

The SMU-4000 is a Simple Network Management Protocol (SNMP) plug-in interface option for IRT 4000 series modules when used in IRT's 4000 series frames.

The SMU-4000 is programmed with a Management Information Base (MIB) suitable for the type of module that it is to be plugged into.

IRT 4000 series cards that are SNMP upgradeable need the SMU-4000 plug-in module programmed with their own relevant MIB to be recognisable by the SNMP system.

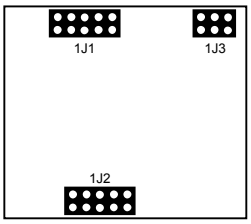
The SMU-4000 acts as an interface between the module that it is plugged into and the CDM-4000 SNMP Agent within the 4000 series frame. Module conditions such as alarm states or signal conditions are communicated to the SNMP Network Management System (NMS) via the CDM-4000 SNMP Agent. Likewise control commands are communicated from the NMS, to the SNMP Agent, to the relevant module via the SMU-4000 plug-in module.

Features:

- **Plug-in SNMP option for IRT 4000 series cards**
- **Programmable Management Information Base (MIB) to suit intended module**

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.

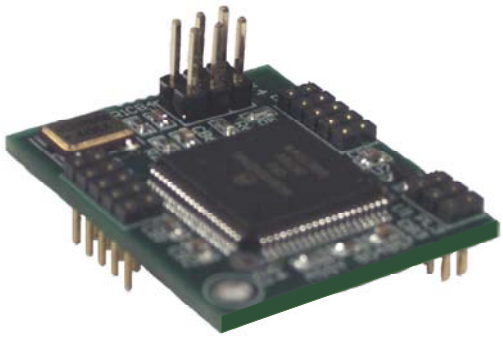


Figure 1: SMU-4000 module

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.

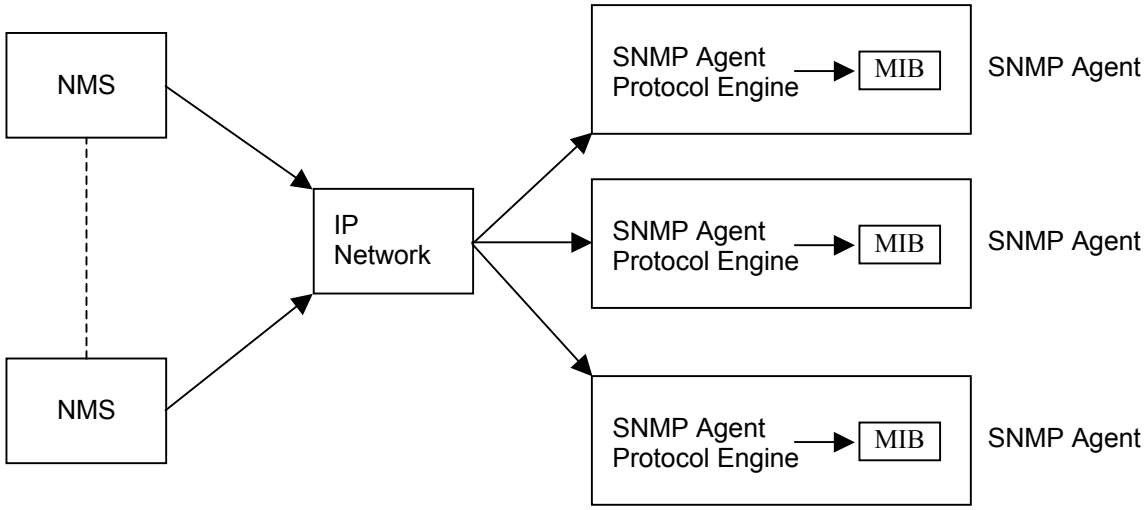
An *NMS* polls, or communicates with, an *agent*. An *agent* is a network management software module that resides in a *managed device*. An *agent* has local knowledge of management information and translates that information into a form compatible with SNMP. The *agent*, therefore, acts as an interface 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

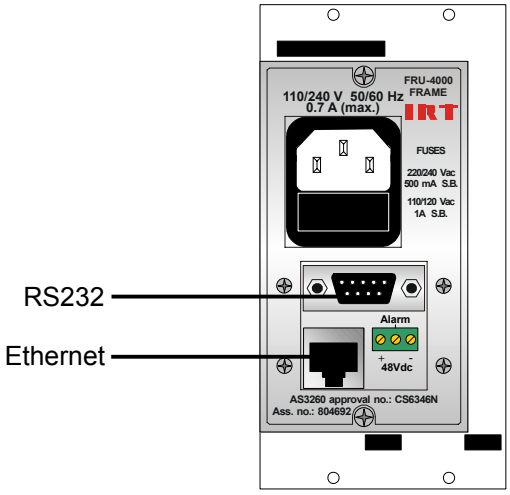
IRT Electronics currently employs SNMPv1 with its 4000 series frame. The frame acts as an *agent* when fitted with a CDM-4000 module. This module has its own designated slot next to the power supply so as to not affect the number of modules that the frame will take. Communication between the *NMS*, the 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.

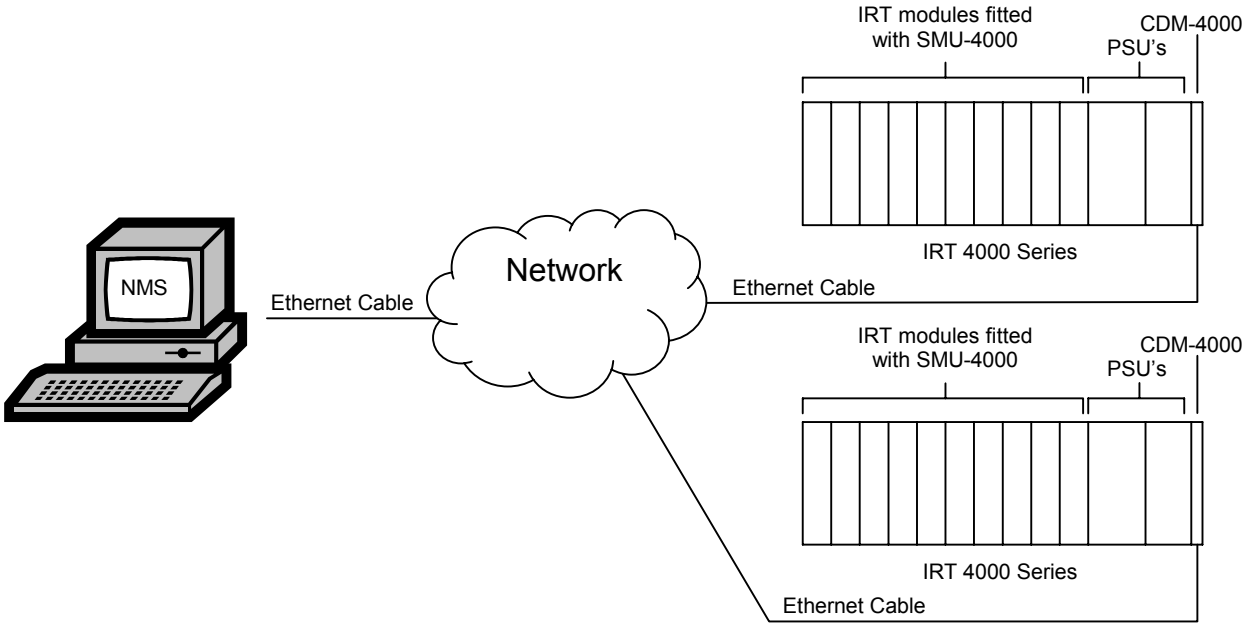
Frame parameters, such as Name, Address and Location, are set via an RS232 interface, a D9 connector on the rear of the frame below the mains inlet. A software terminal emulator, such as Tera Term or HyperTerminal, is used for setting and reading the parameters of the frame.

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

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
ARTARMON
N.S.W. 2064
AUSTRALIA

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

Drawing List Index

Drawing #	Sheet #	Description
804692	1	FRU-4000 Frame schematic
804693		PSU-4000 power supply schematic diagram
804706	1	CDM-4000 Frame controller schematic diagram – sheet 1
804706	2	CDM-4000 Frame controller schematic diagram – sheet 2
804857	1	SMU-4000 Plug-in SNMP card controller schematic diagram