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IRT Eurocard

Type DDA-4320

ASI / SDI / STM-1 Path Protection and Distribution Amplifier
&
ZDA-4320RH
Handshake Changeover Assembly

Designed and manufactured in Australia

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

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Revision History

Revision	Date	By	Change Description	Applicable to:
0	25/01/2010	AL	Original Issue.	Firmware version F3V3 S3V2 S/N: 0912001-0912016
1	22/02/2010	AL	Number of outputs reduced to 4 and AIS detection LED added to front panel.	Firmware version F3V3 S3V2 S/N: ≥ 0912017
2	26/05/2010	AL	SW3-7 DIP switch setting (invert signal) added. Extra states in SNMP signal status added and re-ordered.	Firmware version F3V4 S3V3 S/N: ≥ 0912017
3	04/08/2010	AL	SNMP functions added and changed. Socket number designators (SKx) added to inputs and outputs.	Firmware version DDA4320 F4V0 S4V0 S/N: ≥ 0912017
4	01/09/2010	AL	Alarm conditions changed. SNMP parameters changed.	Firmware versions DDA4320 F4aV1 S4V1 applicable to S/N: ≤ 0912030 & DDA4320 F4V1 S4V1 applicable to S/N ≥ 1009001
5	24/09/2010	AL	DIP switch settings changed. Extra data states added. SNMP descriptors changed to match MIB 4.4.	Firmware versions DDA4320 F4aV2 S4V2 applicable to S/N: ≤ 0912030 & DDA4320 F4V2 S4V2 applicable to S/N ≥ 1009001
6	01/11/2010	AL	Switch SW3-6 operation reversed. External alarm information changed to include AIS detected in STM-1 data. Output 6 socket designator corrected to SK8.	Firmware versions DDA4320 F4aV6 S4V4 applicable to S/N: ≤ 0912030 & DDA4320 F4V6 S4V4 applicable to S/N ≥ 1009001
7	15/11/2010	AL	Pin numbers added to Alarm descriptor in specifications section and input alarm descriptor updated to include power loss to the module. SW3-7 descriptor in configuration section modified for better user understanding.	Firmware versions DDA4320 F4aV6 S4V4 applicable to S/N: ≤ 0912030 & DDA4320 F4V6 S4V4 applicable to S/N ≥ 1009001

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Instruction Book

Table of Contents

This instruction book applies to units with serial numbers ≥ 0912017 & ≤ 0912030 with firmware version DDA4320 F4aV6 S4V4 and serial numbers ≥ 1009001 with firmware version DDA4320 F4V6 S4V4.

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.

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Type DDA-4320
ASI / SDI / STM-1 Path Protection and Distribution Amplifier
&
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Handshake Changeover Assembly

General Description

The DDA-4320 path protection and distribution amplifier covers a wide range of distribution and monitoring functions for ASI, SDI or STM-1 signals.

Four outputs are provided at the rear of the module. The rear assembly includes a bypass relay to switch the Input to Output 6[1] in the event of a power failure.

The DDA-4320 incorporates a protection facility for switching three of the outputs between signals from a companion DDA-4320 when a loss of input is detected. For this configuration, a special double width rear assembly (type ZDA-4320RH) is required to link the signal and logic sections of the two modules.

Changeover-inhibit and changeover-request switches are provided on the front panel for use where modules are so linked.

A manual changeover request may be made either locally by using the front panel switch, remotely via a connection on the rear assembly, or via Simple Network Management Protocol (SNMP) when installed in an IRT frame fitted with SNMP capability.

Applications:

- **Stand alone cable equaliser and distribution amplifier.**
- **Paired for redundant path protection switching.**

Standard features:

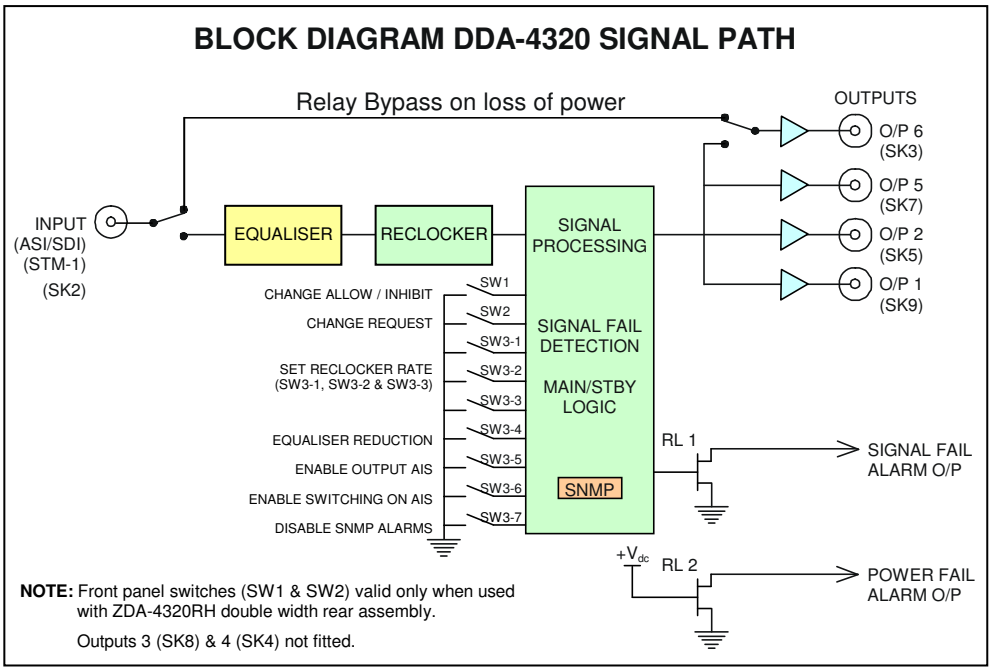
- **For use as buffer or distribution amplifier.**
- **4 x in-phase reclocked outputs.**
- **Protection switching capability.**
- **Selectable for either ASI, SDI or STM-1 applications.**
- **Automatic input equalisation to 250 metres.**
- **Automatic output muting on no input.**
- **Relay bypass on loss of power.**
- **Front panel indicators provide monitoring of presence of input signal at 270 Mb/s (ASI/SDI) or 155 Mb/s (STM-1).**
- **SNMP monitoring and control.**

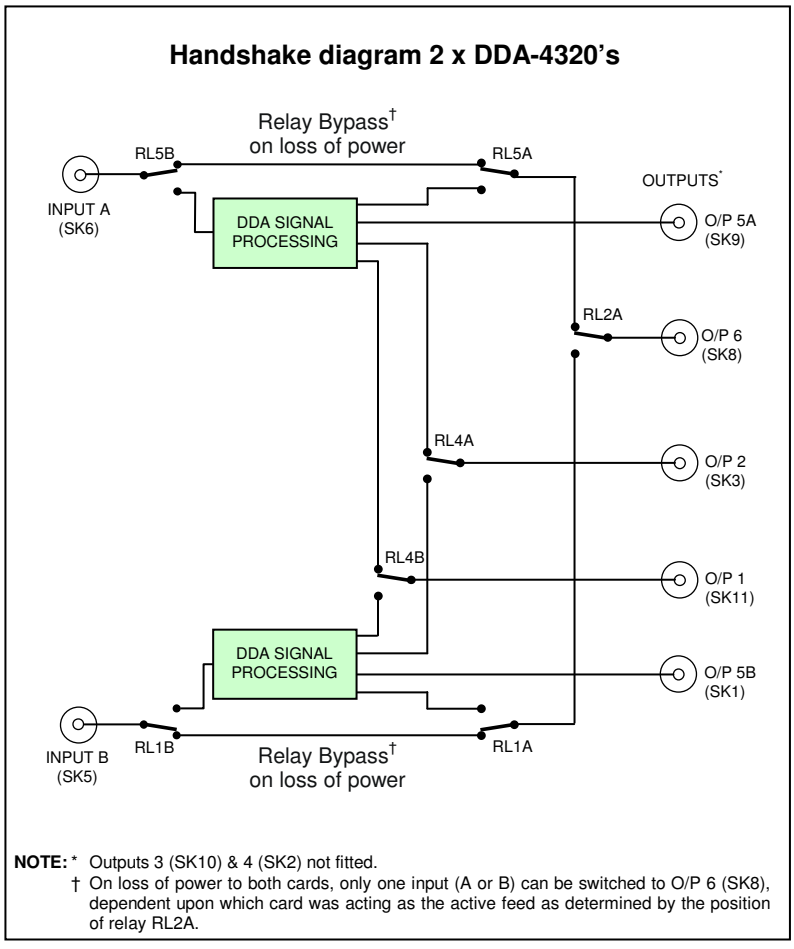
Accessories available:

ZDA-4320RH double rear assembly for handshake:	Connects two adjacent DDA-4320's for automatic changeover of five of the six outputs in the event of a fault being detected, plus pass through of the remaining one on both cards.

[1] NOTE: Four Outputs only - outputs 3 & 4 not fitted.

Functional Diagrams





DDA-4320 Technical Specifications

Input:

Number	1.
Impedance	75 Ω, BNC.
Type	270Mb/s / ASI / SDI, or 155Mb/s STM-1.
Return loss	>15 dB 5 MHz to 270 MHz.
Equalisation	Automatic, better than 250 metres at 270 Mb/s for Belden 8281 or equivalent cable (reduces to approx. 200m when SW3-4 is ON).

Outputs:

Number	4 ASI / SDI, or STM-1. (Relay bypass of input (SK2) to output (SK3) on loss of power or removal of card).
Type	Reclocked.
Level	800 mV ±10% into 75 Ω (270Mb/s / ASI / SDI / STM-1 NRZ encoded); 1.0 V. ±10% into 75 Ω (STM-1 CMI encoded).
Impedance	75 Ω, BNC.
Return loss	>15 dB 5 MHz to 270 MHz.
DC offset	Nil.

Performance :

Reclocking	Selectable for 270 Mb/s / ASI / SDI, or 155 Mb/s STM-1 operation.
Rise time	<1.5 ns, (850 ps typically).
Intrinsic jitter	<0.1 UI (measured with up to 300m of Belden 8281 or equivalent cable).

Front Panel Indicators & Controls:

270Mb		LED (green) for input matching 270Mb/s, ASI, or SDI signal types.
STM-1		LED (green) for input matching STM-1 (or AIS) signal types.
MAIN		LED (green) for module acting as Main path when used with ZDA-4320RH rear assembly. Indicates power to module when used in stand-alone operation.
STANDBY		LED (green) for module acting as Standby path when used with ZDA-4320RH rear assembly. Not valid in stand-alone operation.
DATA LOSS		LED (red) when no input is present, or invalid input signal (not applicable to AIS).
AIS		LED (red) when Alarm Indication Signal (AIS) detected in STM-1 data.
CHANGE	ALLOW	Allow switching to Main, when used with ZDA-4320RH rear assembly.
	INHIBIT	Switching to Main inhibited, when used with ZDA-4320RH rear assembly.
	REQUEST	Switch to Main, when used with ZDA-4320RH rear assembly and Change Allow switch set.

Alarm:

Connector type			3-pin Phoenix style.
	Signal loss -	Pin 1	Open circuit on loss of input, input signal does not match set rate (not locked), AIS detected in STM-1 data, or loss of power.
	Power loss -	Pin 2	Open circuit on loss of power.
		Pin 3	Ground.

Power requirement:

Voltage	28 Vac CT (14-0-14) or ±16 Vdc
Consumption	6.5 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 & red IRT logo.
	Rear assembly	Detachable silk-screened PCB with direct mount connectors to Eurocard and external signals.
Dimensions		6 HP x 3 U x 220 mm IRT Eurocard.
Standard accessories		Rear connector assembly with matching connector for alarm output.
Optional accessories		SMU-4000 SNMP plug-in module for use with 4000 series frame fitted with SNMP "Agent". ZDA-4320RH double width rear assembly, for handshake connection of two DDA-4320's.

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

ZDA-4320RH Technical Specifications

Inputs:

Number	2 [A (SK6) & B (SK5)].
Type	270Mb/s / ASI / SDI, or STM-1 (dependent on DDA-4320 configuration setting).
Impedance	75 Ω, BNC.
Return loss	>15 dB 5 MHz to 270 MHz.

Outputs:

Number	3 switched [outputs 1 (SK11), 2 (SK3) & 6 (SK8)][2] and 2 fixed [outputs 5A (SK9) & 5B (SK1)]. (Relay bypass of active input (SK5 or SK6) to output (SK8) on loss of power or removal of both cards).
Type	270Mb/s / ASI / SDI, or STM-1 (dependent on DDA-4320 configuration setting).
Impedance	75 Ω, BNC.
Return loss	>15 dB 5 MHz to 270 MHz.

Controls & alarms:

Connector: 2 x 5-pin Phoenix style (A & B)

Pin		
	1	Tally – a connection to ground indicates that the corresponding module is the 'Main' path.
	2	External changeover request[3] – connecting to ground will make this module 'Main'.
	3	Input Alarm[4] – an open circuit indicates that there is no input signal present, input signal does not match the set signal type, AIS detected in STM-1 data, or power to the module has failed.
	4	Power Fail[4] – an open circuit indicates that power to the module has failed.
	5	Ground.

NOTE:
2 Outputs 3 (SK10) and 4 (SK2) not fitted.
3 Corresponding front panel toggle switches of module must be in the 'Change Allow' position.
4 The non-alarm state is a connection to ground via a FET relay.

Changeover logic:

A changeover to the companion module will occur under any of the following conditions:

Loss of input signal or input signal does not match the set signal type;
AIS detection alarm (provided AIS is not disabled by switch SW3-6);
Loss of power; and
Manual changeover request either by the DDA-4320 front panel switches, externally via a connection to ground on the Changeover Request pin on the ZDA-4320RH rear assembly, or via SNMP.

In all of the above cases switching will occur only if the companion module is free of the same defects.
The manual changeover requests (local and remote) require that the changeover inhibit switch is not activated on the module currently acting as the Standby unit.

Priority logic:

The priority switching in normal mode follows non reverting logic which dictates:
In the event of failure of the Main DDA-4320, the Standby DDA-4320 will assume control of the switched outputs and become Main causing the failed path DDA-4320 to become Standby. This implies that when the failed path is restored it will remain as Standby and not become Main unless either a failure of Main occurs or a manual changeover is requested.

Power on reset:

When power is applied to the pair, the module which was last operating as Main will remain as Main.

When power is applied to a pair for the first time it may be necessary to request a manual changeover to force the desired module to become Main.

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

Configuration

Switch Settings:

Input signal type (rate set)	SW3-1	SW3-2	SW3-3
SNMP Setting	OFF	OFF	X (OFF or ON)
STM-1 (155Mb/s) CMI encoded	ON	OFF	OFF
STM-1 (155Mb/s) NRZ[5]	OFF	ON	OFF
270Mb/s[6]	ON	ON	OFF
ASI	ON	OFF	ON
SDI	OFF	ON	ON
ASI/SDI	ON	ON	ON

SW3-4 ON Reduced[7] cable equalisation, ≈ 200m;
OFF Normal cable equalisation, > 250m.

SW3-5 ON Enable output AIS[8] on loss of signal, for STM-1 only;
OFF Disable output AIS[8] on loss of signal, for STM-1 only.

SW3-6 ON Enable changeover on AIS[8];
OFF Disable changeover on AIS[8].

SW3-7 ON Disable major and minor SNMP alarms to the frame Agent (CDM card)[9];
OFF Enable major and minor SNMP alarms to the frame Agent (CDM card)[9].

NOTE: 5 For optical transmission, the STM-1 signal presents an NRZ format, without the CMI encoding used in electrical transmission. In this instance it is not an actual optical interface, but an electrical signal that can be fed into an electrical to optical converter to create a true optical STM-1 signal.

6 270Mb/s setting includes ASI, SDI or any other 270Mb/s type of signal conforming to the specified input level parameters, whereas ASI/SDI setting is only for ASI or SDI type of signals.

7 For use with shorter cable runs or use in a noisy environment.

8 AIS stands for Alarm Indication Signal and is defined as all 1's in the data stream.

9 When using TRAPS via SNMP, depending on how system is set up, in order to avoid double reporting of alarms via the DDA-4320 card itself and the CDM card (SNMP Agent) of the frame, major and minor SNMP alarms that are reported to the CDM card of the frame can be disabled.

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.

Stand-alone Operation:

Input & Outputs:

For use with supplied standard rear assembly (ZDA-4320).

Input and Outputs are 75 Ω BNC type for connection with high quality 75 Ω coaxial cable. Input is self-terminating.

A relay bypass is provided on the rear assembly between the Input (SK2) and Output 6 (SK3), the output connector closest to the input connector. Should the card be removed from the rear assembly mounted within the frame, or if a power failure occurs, the input signal will still pass through to this output. For situations requiring a “critical” path, connect to Output 6 (SK3).

Stand-alone Alarm Connections:

A 3-pin Phoenix style screw connector (PL2) is provided on the rear assembly of the module providing the following alarm conditions:

Pin 1 Input Alarm[10] –an open circuit indicates that there is no input signal present, input signal does not match the set signal type, AIS is detected in STM-1 data, or power to the module has failed.
2 Power Fail[10] – an open circuit indicates that power to the module has failed.
3 Ground.

NOTE: 10 The non-alarm state is a connection to ground via a FET relay.

Handshaking Operation:

For use with double width rear assembly (ZDA-4320RH)

Install two DDA-4320 units in adjacent slots in a 3RU frame. Use the ZDA-4320RH double width rear assembly in place of the standard rear assemblies. As viewed from the front of the frame, the left module is designated as 'A' and the right module is designated as 'B'.

Two BNC inputs are provided, A (SK6) and B (SK5). Set module priority by pressing the front panel change request button on your chosen Main feed ensuring correct LED lights on each unit – Main and Standby. The Change-Allow/Inhibit switch must be set to the Allow position for the Change-Request button to work.

Main feed is now connected to switched outputs 1 (SK11), 2 (SK3) and 6 (SK8) on the ZDA-4320RH rear connector assembly. Both Main and Standby feed output 5 out on their own BNC connectors (SK9 & SK1). Note that these two outputs are unswitched and are therefore unsuitable for main program feeds. They are, however, suitable for monitoring the module's performance.

A relay bypass is provided on the rear assembly between the A & B Inputs and Output 6 (SK8), the output connector closest to the input connectors. Should both cards be removed from the double width rear assembly mounted within the frame, or if a power failure occurs, the current Main input signal will still pass through to this output. For situations requiring a "critical" path, connect to Output 6 (SK8).

Alarm and External Control Connections:

Alarm and external changeover functions appear on two 5-pin Phoenix style screw connectors (PL1 and PL6), each controlling its relevant module. PL1 corresponds to the 'B' module and PL6 corresponds to the 'A' module.

Pin 1 Tally – a connection to ground indicates that the corresponding module is acting as the 'Main' path.

2 External changeover request[11] – connecting to ground will make this module 'Main' in handshake mode.

3 Input Alarm[12] – an open circuit indicates that there is no input signal present, input signal does not match the set signal type, AIS detected in STM-1 data, or power to the module has failed.

4 Power Fail[12] – an open circuit indicates that power to the module has failed.

5 Ground.

NOTE: 11 Front panel toggle switch of module must be in the 'Change Allow' position.

12 The non-alarm state is a connection to ground via a FET relay.

Front Panel Indicators and Switches:

The status of the switched outputs is indicated by the 'MAIN' and 'STANDBY' front panel LEDs (green).

When used as a stand-alone distribution amplifier the 'STANDBY' front panel LED is not applicable.

Loss if signal input or input signal does not match the set signal type is indicated by the 'DATA LOSS' front panel LED (red). Not applicable to AIS.

Alarm Indication Signal (AIS) detection is indicated by the 'AIS' front panel LED (red).

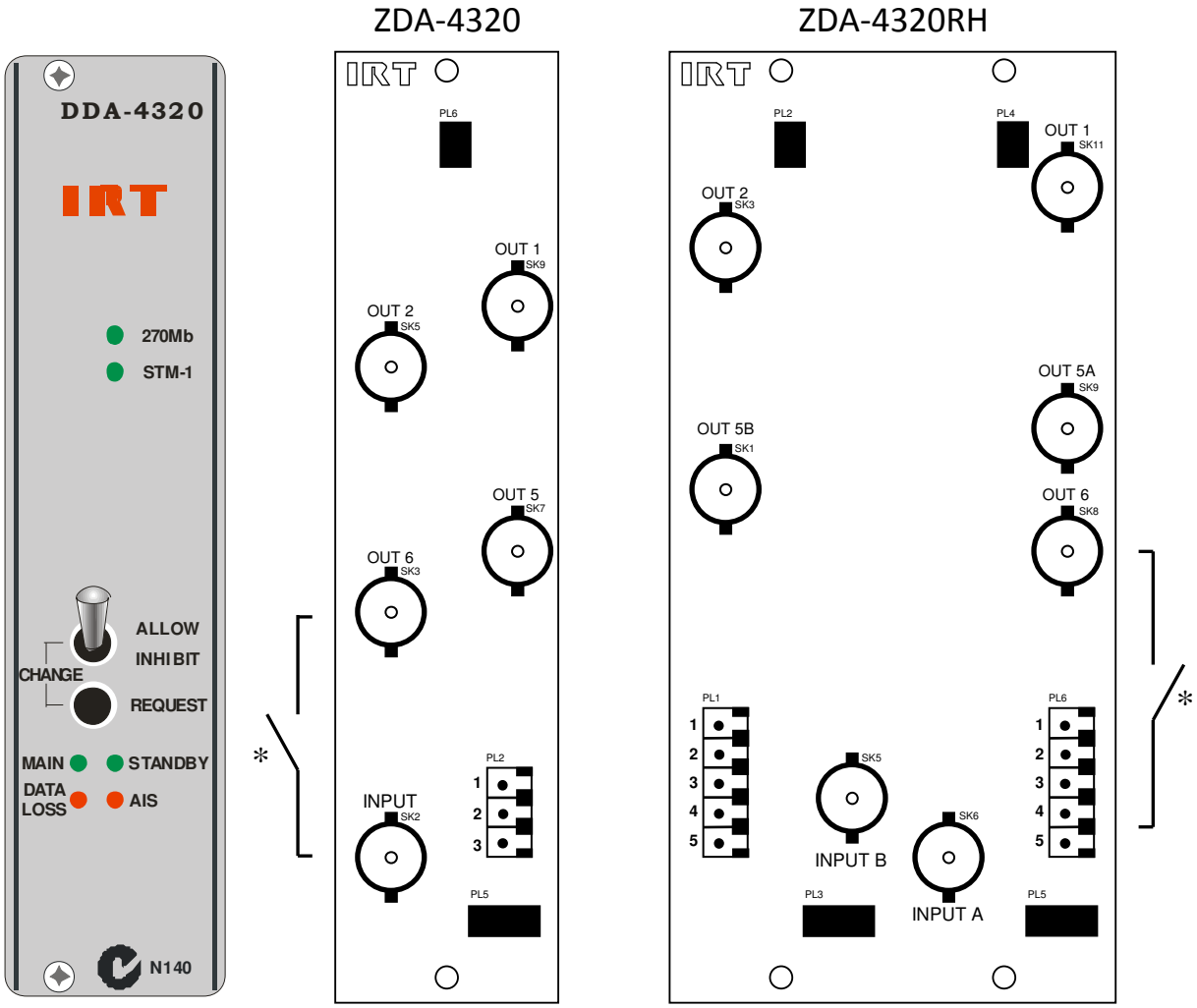
An input signal presence is indicated by either the "270Mb" front panel LED (green) for 270Mb/s signals such as ASI or SDI, or the "STM-1" front panel LED (green) for 155Mb/s STM-1 signals (CMI encoded or NRZ) or AIS.

Two front panel changeover switches allow manual switching between Main and Standby modes when operating the DDA-4320 as a pair with the ZDA-4320RH double width rear assembly. To select a module as Main, press the Change-Request pushbutton of this module. The Change-Allow/Inhibit switch must be set to the Allow position for the Change-Request button to work.

The front panel changeover switches have no function when the DDA-4320 is used in a stand-alone situation.

Front & rear panel connector diagrams

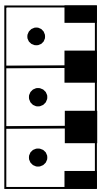
The following front panel and rear assembly drawings are not to scale and are intended to show connection order and approximate layout only.



NOTE: * Relay bypass between INPUT and OUT 6 on loss of power.

ZDA-4320 - Standard rear assembly for single card use.

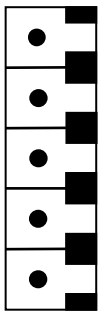
PL2



1	**Alarm on loss of input, input signal invalid, AIS detected, or loss of power.**
2	**Alarm on loss of power.**
3	**Ground.**

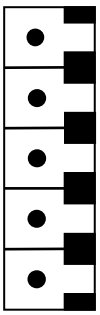
ZDA-4320RH - Double width rear assembly for switching between two DDA-4320's.

PL1



1	**Tally B - unit B is Main.**
2	**C/O request – select B as Main.**
3	**Alarm on loss of B input, B input invalid, AIS detected on B, or loss of B power.**
4	**Alarm on loss of B power.**
5	**Ground.**

PL6



1	**Tally A – unit A is Main.**
2	**C/O request – Select A as Main.**
3	**Alarm on loss of A input, A input invalid, AIS detected on A, or loss of A power.**
4	**Alarm on loss of A power.**
5	**Ground.**

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.

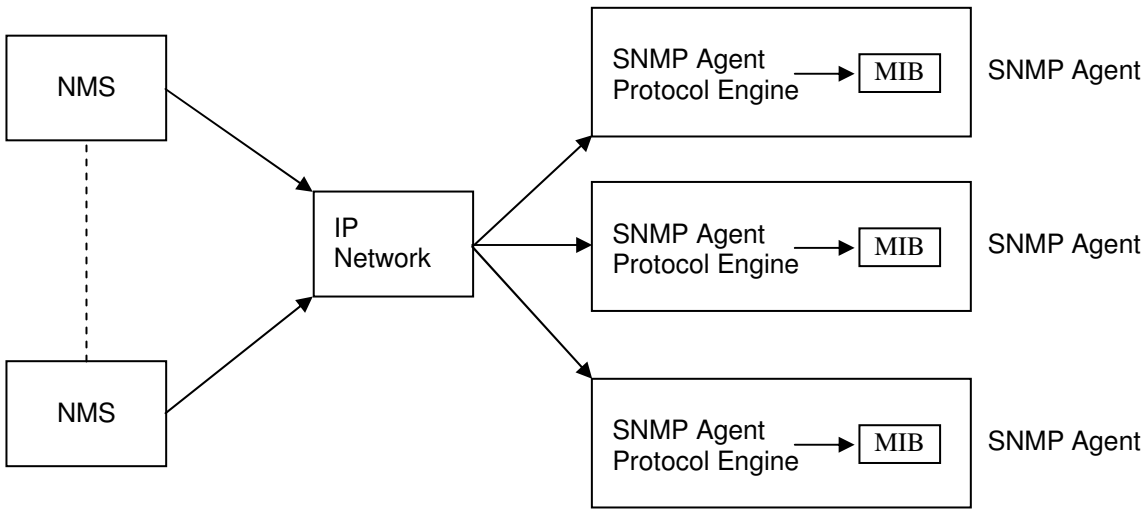
An *NMS* polls, or communicates with, an *agent*. An *agent* is a network management software module that resides in a *managed device*. An *agent* has local knowledge of management information and translates that information into a form compatible with SNMP. The *agent*, therefore, acts as an interface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

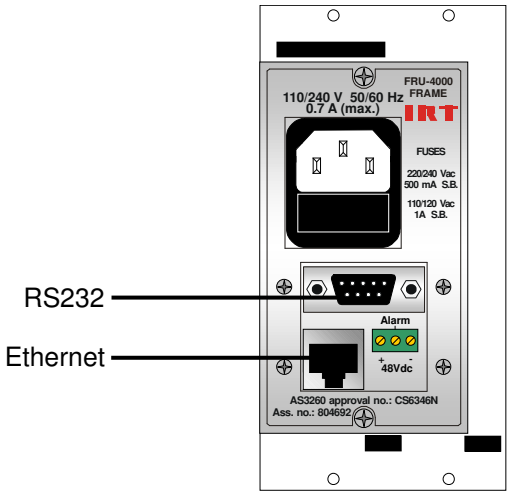
IRT Electronics currently employs SNMPv1 with its SNMP capable frames. The frame acts as an *agent* when fitted with a CDM-xxxx module. This module has its own designated slot next to the power supply so as to not affect the number of modules that the frame will take. Communication between the *NMS*,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

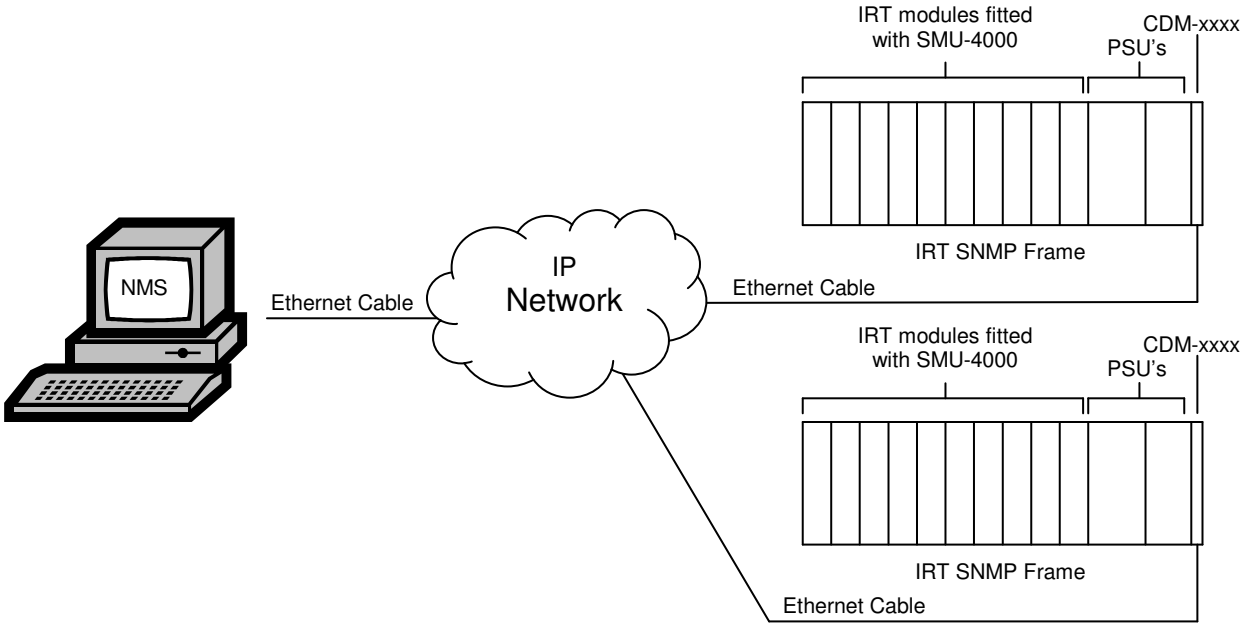
Frame parameters, such as Name, Address and Location, are set via an RS232 interface, a D9 connector on the rear of the frame below the mains inlet. A software terminal emulator, such as Tera Term or HyperTerminal, is used for setting and reading the parameters of the frame.

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-xxxx *agent* via a data bus on the rear of the frame. Thus the CDM-xxxx 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-xxxx *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 SNMP Setup

DDA-4320 SNMP Functions:

With the DDA-4320 installed in an IRT frame fitted with SNMP capability, the following SNMP functions can be monitored and controlled by an SNMP Network Management System (NMS), (Requires MIB revision > 4.4):

Irt4320ddaAlarms
- Read the status of the Urgent and Non-Urgent alarms:
  (1) noAlarm.
  (2) aisDetected: AIS detected in STM-1 data.
  (3) urgentAlarm: Invalid input (not applicable to AIS).

irt4320ddaModuleStatus
- Read and set operational status in relation to partner module:
  (1) main: This module controls the shared outputs. To capture shared outputs, set this value.
  (2) standby: Partner module controls the shared outputs.

  NOTE: To release the shared outputs, set partner module to main.

irt4320ddaInputInfo
- Read the status of the input data signal:
  (1) notPresent: Input not detected.
  (2) notLocked: Input detected but reclocker not locked.
  (3) locked: Reclocker locked to selected input data rate.
  (4) aisDetected: AIS detected in STM-1 data.
  (5) asiDetected: ASI data stream detected.
  (6) sdiDetected: SDI data stream detected.

irt4320ddaInvertInput
- Invert the input data before processing:
  (1) disabled: Input signal not inverted.
  (2) enabled: Input signal inverted.

  NOTE: ASI signals are phase sensitive. If a signal inversion has occurred somewhere earlier in the system, set this setting to enable (2) to correct the data stream.

irt4320ddaDataRate
- Set the input data rate for the reclocker:
  (1) stm1-cmi: Standard STM-1 electrical encoding.
  (2) stm1-nrz: STM-1 optical type encoding.
  (3) mbps270: 270Mb/s types of signals (including both ASI and SDI).
  (4) asi: ASI types of signal only.
  (5) sdi: Standard definition SDI types of signal only.
  (6) asi-sdi: Either ASI or standard definition SDI types of signals only.

  NOTE: Switches SW3-1, SW3-2 and SW3-3 on DDA-4320 override this SNMP setting.

irt4320ddaDataRateCtrl
- Read the method of user interaction:
  (1) snmp: SNMP setting is active.
  (2) pcbSwitches: Switches SW3-1, SW3-2 and SW3-3 on DDA-4320 override SNMP setting.

irt4320ddaCableEQ
- Read the amount of cable equalisation employed:
  (1) normal: Maximum cable equalisation available.
  (2) reduced: Reduced equalisation gain for use in a noisy environment.

  NOTE: Switch SW3-4 on DDA-4320 controls this setting.

irt4320ddaOutputAIS
- Read the status of the Output AIS in STM-1 on loss of input STM-1 signal:
  (1) disabled: No AIS outputted in STM-1 on loss of input STM-1 signal.
  (2) enabled: AIS outputted in STM-1 on loss of input STM-1 signal.

  NOTE: Switch SW3-5 on DDA-4320 controls this setting.

irt4320ddaChangeOnAIS
- Read whether ‘Change to partner module on detection of AIS’ is set:
  (1) change: On detection of AIS in STM-1 input, change to companion module if possible.
  (2) noChange: Does not change to companion module on detection of AIS in STM-1 input.

  NOTE: Switch SW3-6 on DDA-4320 controls this setting.

irt4320ddaModuleStatusTrapEn - Set whether a Trap is sent on change of operational status, that is Main ↔ Standby:
(1) disabled: Trap not sent on change of module state.
(2) enabled: Trap sent on change of module state.

irt4320ddaAlarmsTrapEn - Set whether a Trap on change of alarms status, that is AIS, LOS or invalid input:
(1) disabled: Trap not sent on change of alarm status.
(2) enabled: Trap sent on change of alarm status.

irt4320ddaFirmwareVer - Read the firmware version of the main FPGA in the format 'x.y', where x is the major revision number and y the minor.

irt4320ddaSoftwareVer - Read the software version of the processor in the format 'x.y', where x is the major revision number and y the minor.

irt4320ddaReset - Unit reset control:
(1) normal.
(2) reset: Resets system to power-up default settings. A set with a value of 2 sent to this OID will cause a system reset to occur.

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