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IRT Eurocard

Type AMS-3370
2 x 2 Changeover Relay switcher
for G.703, SDI, ASI, or Analogue Video

Designed and manufactured in Australia

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

IRT Eurocard

AMS-3370 - 2 x 2 Changeover Relay switcher for G.703, SDI, ASI or Analogue Video

Instruction Book

Table of Contents

General Description

The AMS-3370 is a magnetic latching changeover switcher using enhanced performance relays to provide switching capabilities for high speed data signals up to 270 Mb/s. It is suitable for switching ASI or G.703 MPEG data streams and SDI or analogue video signals.

The AMS-3370 is arranged as a changeover switch with two inputs and two outputs. No terminations are provided on the board; allowing the switcher to be used in a wide variety of applications and with signals of various types and impedances.

The magnetic latching characteristic of the special high performance relay allows momentary control and no change in path during power loss. Remote changeover is by either a momentary ground connection or, when an on board link is installed, by a +12/0 Vdc logic toggle.

The signal path may be used with video, SDI, MPEG or RF signals of 75 Ohms. When used with SDI and high-speed data signals all cable lengths should be kept to a minimum.

For best performance the outputs should be connected to inputs with automatic cable equalisation.

The AMS-3370 is ideally suited to applications where a simple choice between two inputs or outputs is required and may be easily driven by detector circuits for automatic path selection.

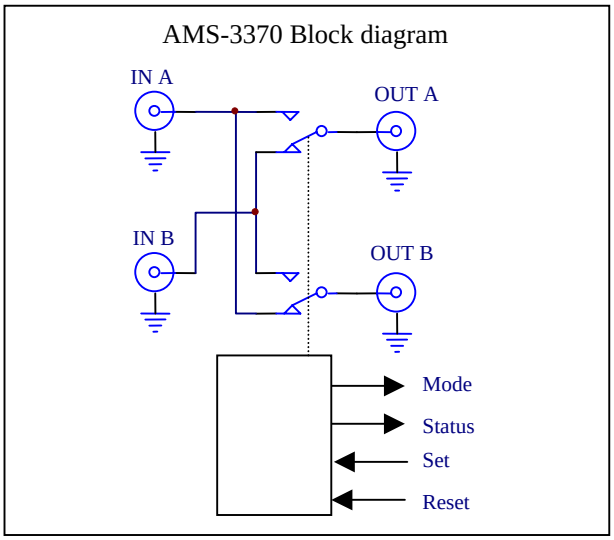
Remote indication of tally and local/remote status is provided for integration into central alarm and monitoring systems.

An on board rectifier and 12 volt regulator circuit provides the operating voltage for the relay cards.
The AMS-3370 relay card is built to the Eurocard format and will mount in an IRT 1RU or 3RU frame.

Standard features:

- Signal path suitable for SDI (270 Mb/s), analogue video, ASI & MPEG data streams @ 2, 8, 34, 45, 144 Mb/s.
- Momentary Set/Reset or HI/LO logic control.
- No path change on power fail.
- Local or remote control.
- Front panel LED status indicators.

Functional Block Diagram:



Technical Specifications
IRT Eurocard module
Type AMS-3370

Signal path:

Signal types	Video/SDI/ASI/MPEG
Switching characteristic	Magnetic latching 4 port changeover relay.
Crosstalk between channels	< -45 dB to 100 MHz. (With measured channel input terminated by 75 Ω.)
Return loss	15 dB @ 135 MHz. 25 dB @ 45 MHz.
Frequency response	+0/-1 dB to 270 MHz.

Auxilliary Data:

Mode	Contact set – Local = SC, Remote = OC.
Data/Tally	Magnetic latching relay changeover contact set.

Remote Control:

Mode	Momentary ground to the relay coil with the common of the coil circuit connected to +12 Volts. or +12/0 Vdc logic toggle. (Mode selected by PCB link.)
Power requirement	56 mA sink to ground.

Connectors:

Video:	BNC.
Control & Status:	Krone LSA plus.

Other:

Relay contact rating	24 Vdc - 1 A 100 Vac - 0.3 A
Power requirements:	28 Vac CT (14-0-14) or ± 16 Vdc
Power consumption	1 VA.
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 enamel, silk-screened 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.
Supplied accessories	Rear connector assembly with matching connectors for control input and tally/mode outputs.
Optional accessories	Instruction manual. TME-6 module extender card.

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

Technical Description

See drawing 804217 in the back of this manual.

The AMS-3370 consists of two dual magnetic latching relays controlled by either front panel switch, when the unit is switched to local operation, or by remote switching, when unit is set to remote operation.

When front panel local/remote switch is set to 'Local', selecting 'Input Select' switch to 'Input 1' resets the two dual magnetic latching relays, switching, via RLA, *Input 1(A)* to *Output 1(A)* and *Input 2(B)* to *Output 2(B)*. Relay RLB switches on Input 1's front panel LED and connects terminals 1 and 2 of TB1 on the rear connector assembly for remote monitoring of the input/output status. Selecting 'Input Select' switch to 'Input 2' sets the two dual magnetic latching relays switching *Input 1(A)* to *Output 2(B)* and *Input 2(B)* to *Output 1(A)*. Relay RLB switches on Input 2's front panel LED and connects terminals 1 and 3 of TB1 on the rear connector assembly for remote monitoring of the input/output status.

Also when in the 'Local' mode of operation, pins 1 and 2 on TB2 are short-circuited together and when in 'Remote' mode of operation, pins 1 and 2 on TB2 are open circuited. Pin 3 on TB2 is connected to ground and can be used, if desired, to provide a switched ground signal, in conjunction with pins 1 and 2, to provide local/remote module status to an external alarm. This allows the remote operator or equipment to know whether the module can be remotely controlled or not as the unit can only be remotely controlled when the module is set to remote operation.

When in the remote mode of operation, TB3 provides the set and reset control points via pins 2 and 1 respectively. Pin 3 is connected to ground to act as a switching reference. When a momentary ground contact is made to the relevant set or reset ports, relays change to the relevant state. Set causes a changeover state such that *Input 1(A)* goes to *Output 2(B)* and *Input 2(B)* goes to *Output 1(A)* and reset causes relays to reset resulting in *Input 1(A)* going to *Output 1(A)* and *Input 2(B)* going to *Output 2(B).*

Alternatively, instead of controlling set and reset by momentary ground contacts, a link exists on the board enabling +12/0 Vdc switching to occur. 0 Vdc controls the set control (pin 2 on TB3), +12 Vdc controls the reset control (pin 1 on TB3). Note that these two control ports need to toggle in order for this type of control to work, i.e. both set and reset cannot be controlled at the same time.

Being magnetically latched relays, if a power failure occurs, relays will remain in their current state of operation.

Power supply:
The AMS-3370 power supply consists of two full wave rectifier circuits D4 – D7, C1, three terminal regulator U 1 and C2 to provide the +12 volts required to operate the relay circuits.

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.

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.

Internal Adjustments

The AMS-3370 requires no internal adjustments for correct operation.

Configuration

Remote control mode:
With the front panel switch set for remote control operation, for controlling the AMS-3370 changeover relay by momentary ground contact only, ensure that the link located near the front panel at the top of the board is removed. For controlling with a +12/0 Vdc toggle control, ensure that this link is in place.

Input termination:
No terminations are provided on the module so that the switcher can function in changeover mode. For 2 x 1 switcher applications the following terminations should be installed.

Output A only is used and should be terminated at connected equipment.
Output B should be terminated in 75 Ohms (or 50 Ohms if being used for 50 Ohm RF signals) using a BNC termination plug.

Installation

Installation in frame or chassis:

See details in separate manual for selected frame type.

See also *Configuration*.

Signal connections:

Signal connections are made to BNC coaxial connectors. No termination of inputs is provided on the module. When switched to the output the input load impedance is that of the load connected to the output.

Control connections:

Switch status is made by a relay contact on TB1 Krone connector located on the rear assembly. With pin 2 short circuited to pin 1 (pins 1 and 3 open circuited), module is in reset position, i.e. Input 1 to Output 1 and Input 2 to Output 2. Likewise, if pin 3 is short circuited to pin 1 (pins 1 and 2 open circuited) then module is in set position, i.e. Input 1 to Output 2 and Input 2 to Output 1.

Control input connector TB1 pin configuration is as follows:

Pin	Description
1	Relay common contact
2	Relay reset contact
3	Relay set contact

Local/Remote mode is made by a switch contact closure between pins 1 and 2 on TB2 Krone connector located on rear assembly. When pins 1 and 2 are short-circuited together, the unit is in Local mode of operation. Likewise, when pins 1 and 2 are open-circuited, the unit is in Remote mode of operation. Front panel switch sets the mode of operation. Common ground is provided on pin 3 for use if desired.

Control input connector TB2 pin configuration is as follows:

Pin	Description
1	Switch common contact
2	Switch local contact
3	Ground

Remote control connections are via TB3 Krone connector located on the rear assembly.
With link LK removed, connecting the appropriate control input momentarily to ground will cause the relays to operate and the output state to cross over as follows:

Control	Input		Output
Reset (Gnd)	A	↔	A
	B	↔	B
Set (Gnd)	A	↔	B
	B	↔	A

With link LK in place, connecting the appropriate control input to +12/0 Vdc will cause the relays to operate and the output state to cross over as follows:

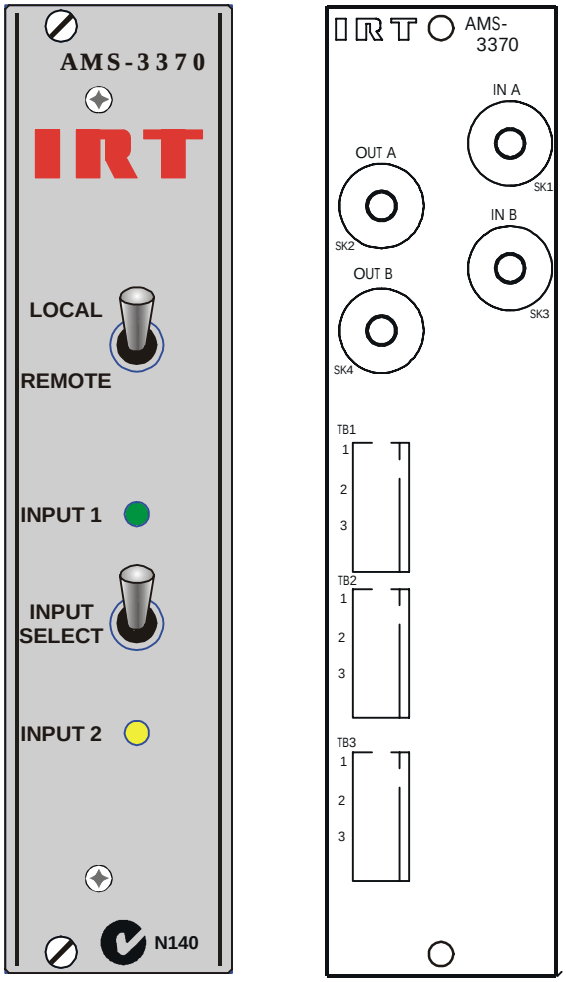
Control	Input		Output
Reset (+12 Vdc)	A	↔	A
	B	↔	B
Set (Gnd)	A	↔	B
	B	↔	A

Control input connector TB3 pin configuration is as follows:

Pin	Description
1	Reset control
2	Set control
3	Ground

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.

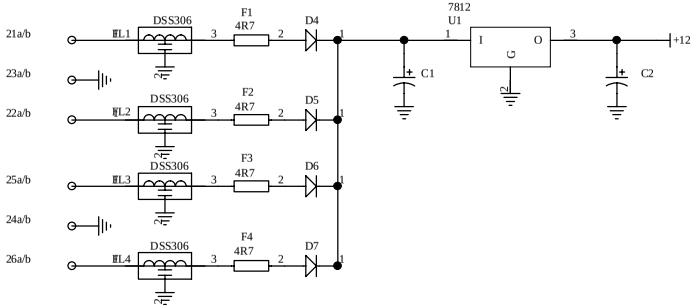
The equipment should be returned **to the agent who originally supplied the equipment** or, where this is not possible, to IRT direct as follows.

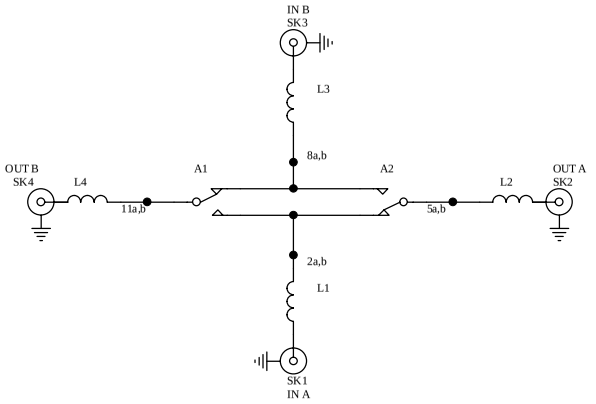
Equipment Service
IRT Electronics Pty Ltd
26 Hotham Parade
ARTARMON
N.S.W. 2064
AUSTRALIA

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

Drawing Index

Drawing #	Sheet #	Description
804217	1	AMS-3370 main circuit schematic.



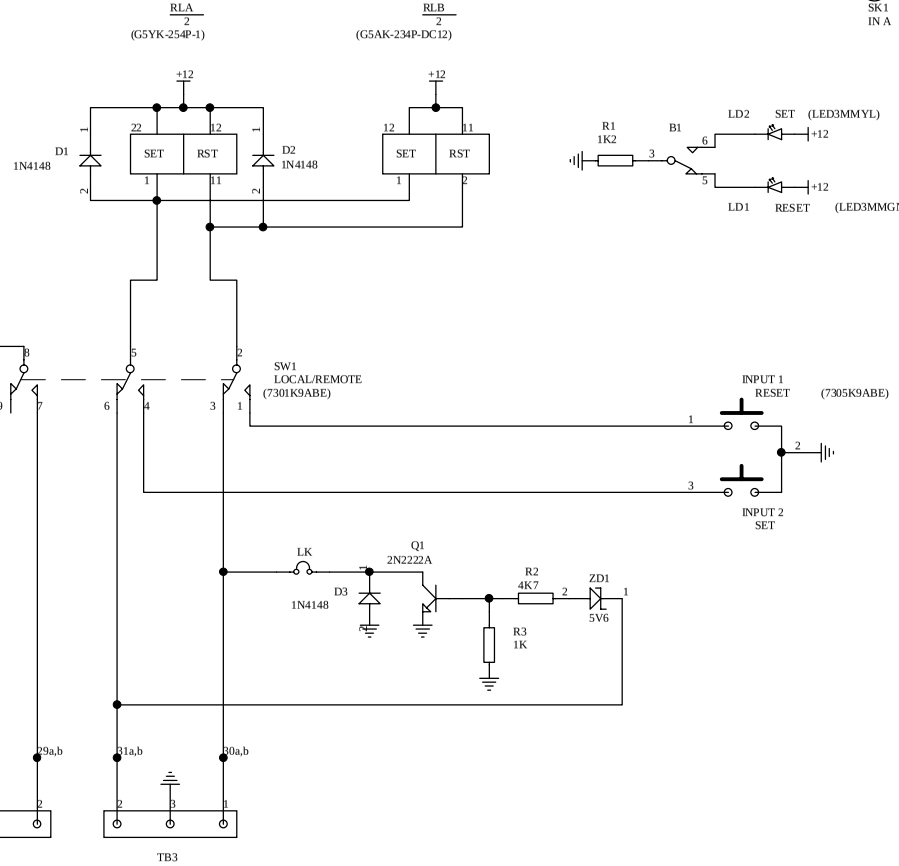


FREQUENCY RESPONSE : +0/-1dB DC TO 270MHz

RETURN LOSS : 15dB @ 135MHz
26dB @ 45MHz

ISOLATION : 45dB @ 100MHz

RELAY OPERATE CURRENT : 56mA



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1 10/10/98
2 26/02/01

DRAWN

CHECKED

ENG. APP.

CONTRACT No.

IRT

SIZE A3

TITLE AMS-3370
4 PORT CHANGE OVER
RELAY MODULE

SCALE

DRAWING No. 804217

SHEET 1 OF 1

IRT Electronics Pty. Ltd.
ARTARMON NSW AUSTRALIA 2064