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IRT Eurocard Type

DDA-3010
140/155 Mb/s G.703 6 O/P
Reclocking Distribution Amplifier

Designed and manufactured in Australia

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

DDA-3010

140/155 Mb/s G.703 6 O/P
Reclocking Distribution Amplifier

Instruction Manual

Table of Contents

This instruction manual applies to DDA-3010 later than S/N 0401001

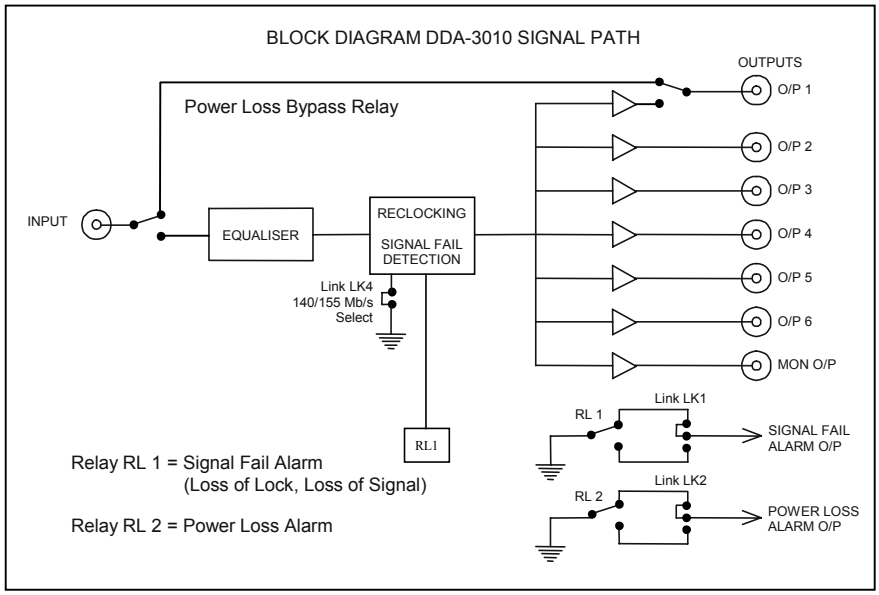
Operational Safety:

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.

Description



The IRT DDA-3010 is a single input, six out 140/155 Mb/s data distribution amplifier whose input and outputs comply with ITU Rec. G.703.

Due to the fact that standard loop through techniques used in the analogue domain are unsuitable to the digital domain most digital equipment comes with no facility to route the input signal to other locations. As a result a DDA is required at almost every point in the digital chain.

Serial digital signals also suffer severe deterioration over relatively short cable distances. The DDA-3010 provides a means of extending the working distances that can be achieved by equalising, reclocking and re-transmitting the data mid route.

The DDA-3010 provides input cable equalisation and reclocking of the serial digital signal, muting of the output signal when no input signal is applied and external alarm contacts on loss of signal or loss of lock and loss of the power supply.

Six individually sourced outputs are provided at the rear of the module and a monitoring port is provided on the front panel. In the event of a power failure, a bypass relay automatically switches the input signal to output 1.

Indicators are provided on the front panel for: Signal present.
155 Mb/s operation.
140 Mb/s operation.
Power on.

The DDA-3010 may be mounted in IRT's 1 RU or 3 RU frames with other analogue or digital modules.

Standard features:

- **Input and output connections on the rear panel.**
- **Automatic input equalisation to 250 metres.**
- **Data regeneration & re-clocking.**
- **Automatic output muting on no input.**
- **External alarms.**
- **Front panel indicators provide monitoring of presence of input signal.**
- **Front panel indication of link selection of operating rate 140 Mb/s or 155 Mb/s.**

Technical Specifications
DDA-3010

140/155 Mbits/s data (link selectable):

Input:

Type	AC coupled.
Impedance	75 Ω terminated.
Electrical characteristics	to ITU-T Rec. G.703 interface at 139,264 kbit/s or 155.520 kbit/s, link selectable, (see below).

Outputs:

Type	AC coupled.
Number	6 regenerated data located on rear connection assembly.
Impedance	75 Ω source terminated.
Electrical characteristics	to ITU-T Rec. G.703 interface at 139,264 kbit/s or 155.520 kbit/s, link selectable, (see below).

Performance:

Cable Equalisation	Automatic, better than 250 metres for Belden 8281 or equivalent cable.
Jitter Tolerance	As per ITU-T Rec. G.823 Table 2.

Connectors:

Data:	BNC 75 Ω.
Alarm:	Krone LSA plus.

Indicators:

Power	LED (green) for +5V.
Signal present	LED (green).
155 Mb/s operation	LED (green).
140 Mb/s	LED (yellow).

Alarm signal:

Power Loss Alarm	N/O or N/C, link selectable, relay contact closure to ground on power failure.
Signal Failure Alarm	N/O or N/C, link selectable, relay contact closure to ground on loss of input signal or loss of signal lock.

Power Requirements:

Voltage	28 Vac CT (14-0-14) or ± 16 Vdc.
Power consumption	3 VA (< 107 mA).

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		DDA-3010 rear connector assembly (supplied with module).
Optional accessory		Instruction manual.

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

Electrical characteristics of signal:

CMI coded binary signal - to ITU-T Rec G.703

Test load impedance	75 Ohms resistive.
Nominal peak to peak	1.0 ±0.1 V.
Rise time between 10% and 90% amplitudes of the measured steady state amplitude	< 2 ns.
Transition timing tolerance (referred to the mean value of the 50% amplitude points of negative transitions)	Negative transitions: ± 0.1 ns. Positive transitions at unit interval boundaries: ± 0.5 ns. Positive transitions at mid-intervals: ± 0.35 ns.
Input return loss	> 15 dB over the frequency range 7 MHz to 210 MHz.
Output return loss	> 15 dB over the frequency range 7 MHz to 210 MHz.

Technical Description

The input circuit of the DDA-3010 consists of an adaptive cable equaliser IC, which automatically adapts to equalise any cable length from zero metres to lengths that attenuate the signal by 40 dB at 200 MHz. This corresponds to 300 metres of Belden 8281 cable. A carrier detect and output mute circuit is used to mute the output when no signal is present.

The DDA-3010 also features an OUTPUT MONITOR point on the front panel. The output monitor is an isolated copy of the signal present at the rear panel outputs.

The output of the input stage is coupled to a reclocking circuit, which then feeds cable driver circuits to provide the six isolated in phase outputs from the DDA-3010.

The input cable equaliser and reclocking circuits incorporate carrier detection circuits to mute the output when no signal is applied to the unit. The carrier detect signal and lock signal of the reclocker are used to energise relay, RL1 via a transistor, Q1, when locked carrier is present. A second relay, RL2, de-energises on loss of power to give a separate alarm for loss of power. The relay contacts are connected to SK10 on the rear panel to give a failure alarm in the form of a make (or break) to ground on failure as set by a links LK1 and LK2, respectively, on the circuit board.

The dual AC inputs are rectified and then regulated by a switch mode regulator circuit to provide the +5V operating voltage for the unit.

+5Vdc is fed to pin 32a of the rear Euro-connector via a polyfuse, F5. The +5V is to provide power for a signal bypass relay rear assembly. The polyfuse protects the +5V power rail by going high impedance should pin 32a be shorted to ground. This protects against the accidental insertion of the DDA-3010 in anything other than its standard rear assembly.

Installation

Handling:

The DDA-3010 contains static sensitive devices and proper static free handling precautions should be observed.

When individual modules are stored, they should be placed in antistatic bags and proper antistatic procedures should be followed when inserting and removing cards from these bags.

Power:

Ensure that the voltage selection of the IRT mounting frame used to house the DDA-3010 and the local AC mains supply voltage match and that the correct rating fuse is installed in the mounting frame power supply.

Earthing:

Chassis earth connection of the equipment mounting frame is via the earth connection on the three pin (IEC) AC mains supply inlet. This is a safety earth and must be connected.

Installation in frame or chassis:

See details in separate manual for selected frame type.

Links LK1 is factory set for a contact make to ground on signal failure at SK10 pin 2 on the rear panel, move LK1 from the normally closed (N/C) to the normally open (N/O) position for a break to ground on loss of signal loss or loss of lock.

Links LK2 is factory set for a contact make to ground on signal failure at SK10 pin 3 on the rear panel, move LK2 from the normally closed (N/C) to the normally open (N/O) position for a break to ground on loss of power.

Link LK4 in the OUT position sets the card for 140 Mb/s operation and is indicated by the '140' front panel LED (yellow).

Link LK4 in the IN position sets the card for 155 Mb/s operation and is indicated by the '155' front panel LED (green).

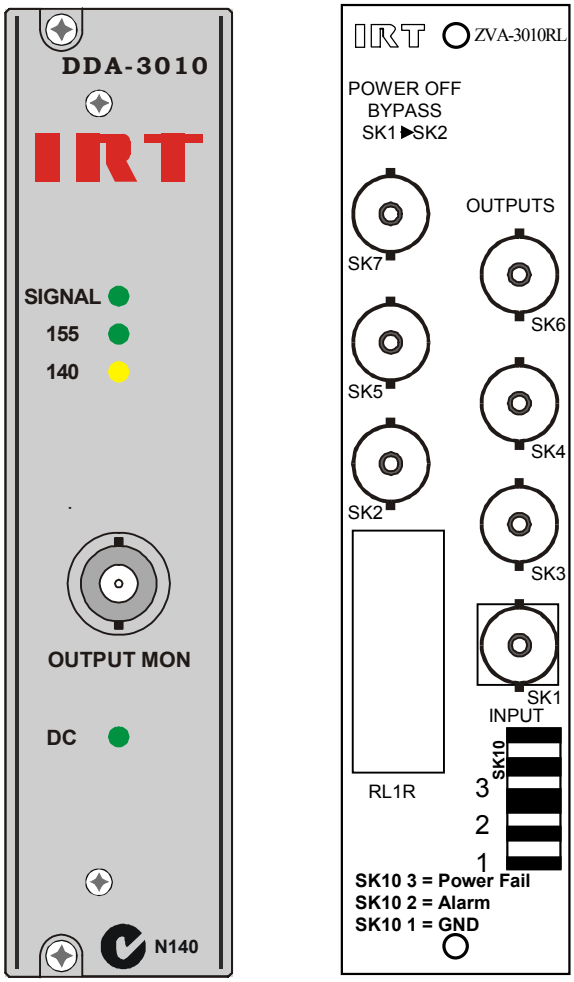
The presence of either a 140 Mb/s or 155 Mb/s locked signal is indicated by the 'SIGNAL' front panel LED (green).

The presence of the internal +5 Vdc supply is indicated by the front panel LED (green).

It is recommended that unused outputs on the rear panel be terminated with 75-ohm termination plugs.

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.

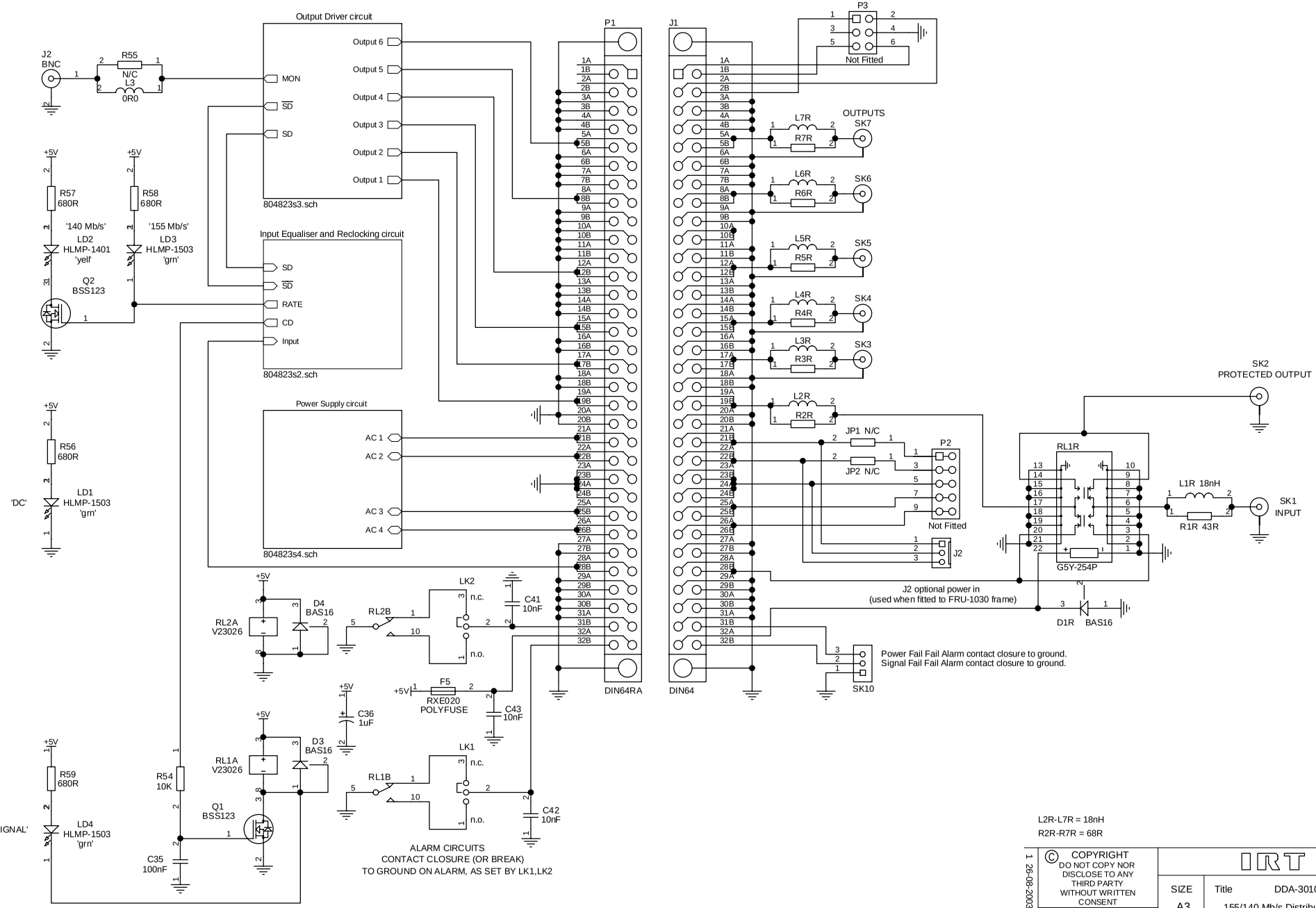
The equipment should be returned **to the agent who originally supplied the equipment** or, where this is not possible, to IRT direct as follows.

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
804823	1	DDA-3010 Circuit Schematic



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DRAWN K.N.	SIZE A3	Title DDA-3010 155/140 Mb/s Distribution Amplifier	
CHECKED	SCALE N.T.S.	Drawing No. 804823	Sheet 1 of 4
ENG. APP.			
Revision: A	IRT Electronics Pty. Ltd. ARTARMON NSW AUSTRALIA 2064		
Date: 29-Jan-2004			