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IRT Eurocard

Type MDD-4490

MPEG 2 Transport Stream Monitor

Designed and manufactured in Australia

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

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Type MDD-4490

MPEG 2 Transport Stream Monitor

Instruction Book

Table of Contents

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

Operational Safety:

WARNING

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

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

IRT Eurocard
Type MDD-4490
MPEG 2 Transport Stream Monitor

General Description

The primary function of the MDD-4490 is to raise an alarm if its input MPEG Transport Stream fails. Its secondary function is to raise an alarm if the Transport Stream is not the correct stream as identified by its Stream Id. Thirdly it can raise an alarm if a particular program number is missing from the stream and in addition monitors a number of the parameters of first priority measurements of ETR290.

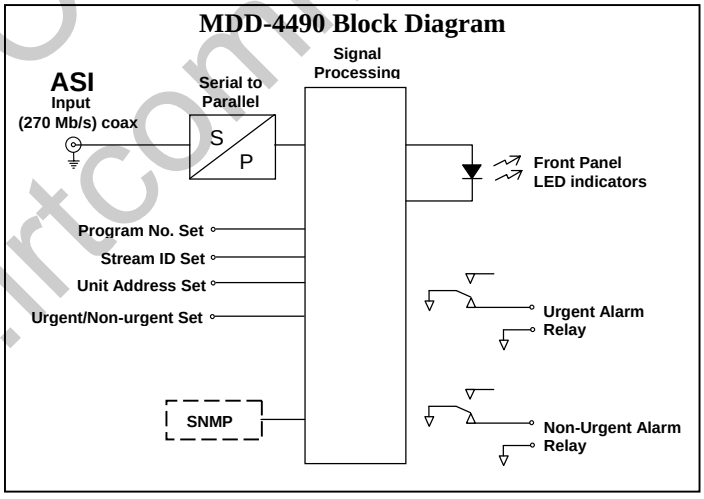
There are 5 green status LEDs named PAT, SID, PMT, PGM and PCR. These five should be illuminated in the presence of a valid Transport Stream. 204 is another green LED that lights when the input signal is a 204 byte packet length signal. CNT is an amber LED and lights on a Continuity Count error. ASI is red and indicates a failure of the Transport Stream.

There are two relays whose contacts are available on the rear assembly. They are labelled Urgent and Non-Urgent. If the Urgent relay operates then the red URG led on the front panel will light. If the Non-Urgent relay operates then the amber led NON will light. Each of the relays can be selected (by dip switches) to operate on any or all of the error states of any of the seven status LEDs.

Simple Network Management Protocol (SNMP) monitoring is possible if mounted in IRT's 4000 series frame fitted with SNMP capability.

Standard features:

- **Raises an alarm if its input MPEG stream fails.**
- **Raises an alarm if the ASI Transport Stream is not the correct stream as indicated by its stream ID.**
- **Raises an alarm if a particular Program Number is missing from the stream.**
- **Monitors a number of the parameters of first priority measurements of ETR290.**
- **Front panel alarm LEDs and rear panel urgent and non-urgent relays.**
- **SNMP Monitoring capability.**



Technical Specifications

IRT Eurocard module
Type MDD-4490

Input: 1 x ASI-C

Impedance	75Ω.
Level	800 mVp-p.
Connector	BNC.

Alarm Outputs: 1 x N/C settable Urgent Relay,
1 x N/C settable Non-Urgent Relay,

Monitor Output: SNMP when fitted within IRT's 4000 series frame fitted with SNMP Agent..

Front Panel Indicators:

PAT - Program Association Table (Present)
PMT - Program Map Table (Present)
PCR - Program Clock Reference (Present)
SID - Stream ID (Correct)
PGM - Program Number (Present)
204 - 204 byte packet length input signal
ASI - ASI (Loss of or faulty)
CNT - Continuity Count (Error)
URG - Urgent Alarm status
N.URG - Non Urgent Alarm Status

Power Requirements	28 Vac CT (14-0-14) or ± 16 Vdc.
Power consumption	<3.5 VA.

Other:

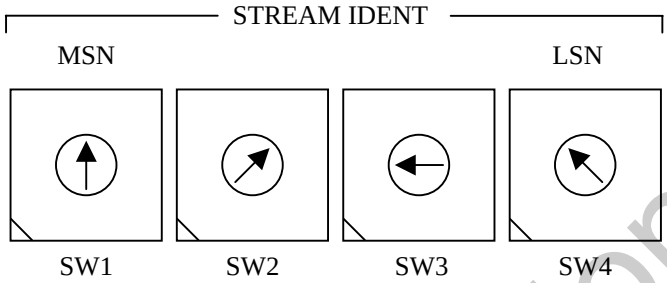
Temperature range		0 - 50° C ambient.
Mechanical		Suitable for mounting in IRT 19" rack chassis with input, output and power connections on the rear panel.
Finish:	Front panel	Grey background, silk-screened black lettering & red IRT logo.
	Rear assembly	Detachable silk-screened PCB with direct mount connectors to Eurocard and external signals.
Dimensions		6 HP x 3 U x 220 mm IRT Eurocard.
Supplied accessories		Rear connector assembly.

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

Configuration

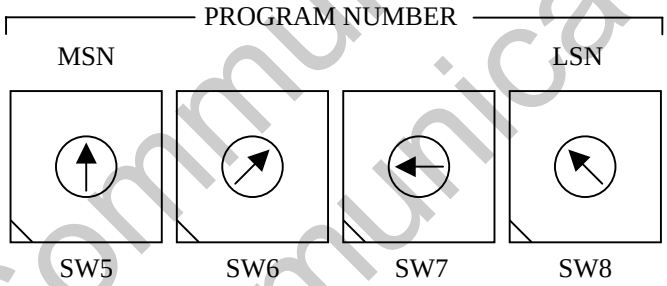
Stream Ident (SID):

Switches SW1 to SW4 are 16 position rotary switches used for setting the Stream Id, which will be compared to that of the Transport Stream. If the MPEG stream's identification number matches the settings of SW1 to SW4, the SID LED is lit. An incorrect match can cause a non-urgent alarm if SW10-7 is set, or an urgent alarm if SW11-7 is set.



Program Number (PGM):

Switches SW5 to SW8 are 16 position rotary switches used for setting the Program Number, which will be compared to the one in the Transport Stream. If a Program Number in the MPEG stream matches the setting of SW5 to SW8, the PGM LED is lit. An absence for more than 0.5 seconds of a matching Program Number in the stream can cause a non-urgent alarm if SW10-5 is set, or an urgent alarm if SW11-5 is set.



Urgent / Non-urgent Alarm settings:

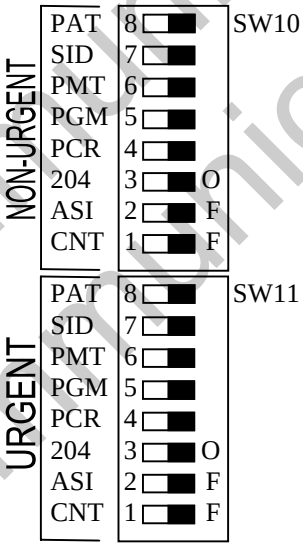
Switches SW10 and SW11 are 8 way Dual-In-Line (DIL) switches used for selecting the conditions that will cause the Urgent and Non-urgent alarms to occur.

On SW10, operation of the switches associated with PAT, SID, PMT, PGM, PCR and 204 will cause a Non-urgent alarm when the associated LED extinguishes. In the case of ASI and CNT, operation of their associated switches will cause a Non-urgent alarm when the LEDs turn on.

SW11 is used in a like manner for the Urgent Alarm.
It is possible to set a condition to raise both an Urgent and Non-urgent alarm.
An alarm condition (or loss of power) causes a ground to appear on the appropriate Rear assembly pin.

SW10 & SW11 fault conditions:

Position	8	PAT - Program Association Table (Missing)
	7	SID - Stream ID (Incorrect)
	6	PMT - Program Map Table (Missing)
	5	PGM - Program Number (Missing)
	4	PCR - Program Clock Reference (Missing)
	3	204 - Input signal is not of a 204 byte packet length
	2	ASI - ASI (Loss of or faulty)
	1	CNT - Continuity Count (Error)



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.

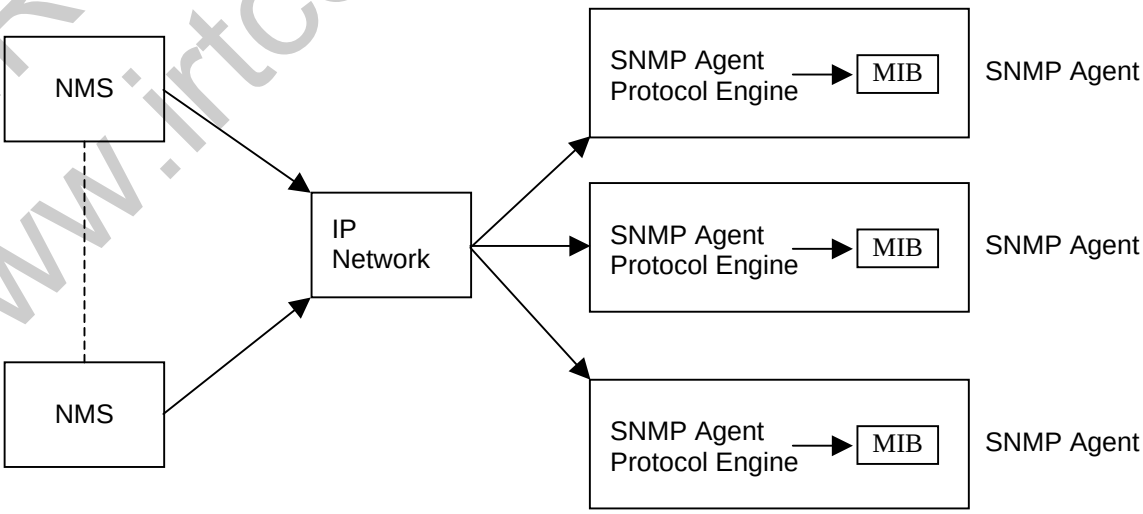
An *NMS* polls, or communicates with, an *agent*. An *agent* is a network management software module that resides in a *managed device*. An *agent* has local knowledge of management information and translates that information into a form compatible with SNMP. The *agent*, therefore, acts as an interface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

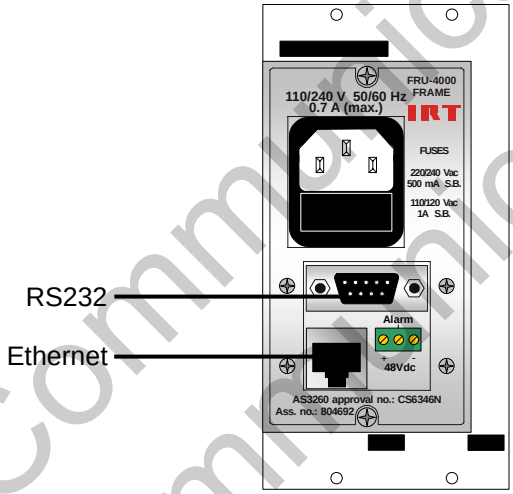
IRT Electronics currently employs SNMPv1 with its 4000 series frame. The frame acts as an *agent* when fitted with a CDM-4000 module. This module has its own designated slot next to the power supply so as to not affect the number of modules that the frame will take. Communication between the *NMS*, the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

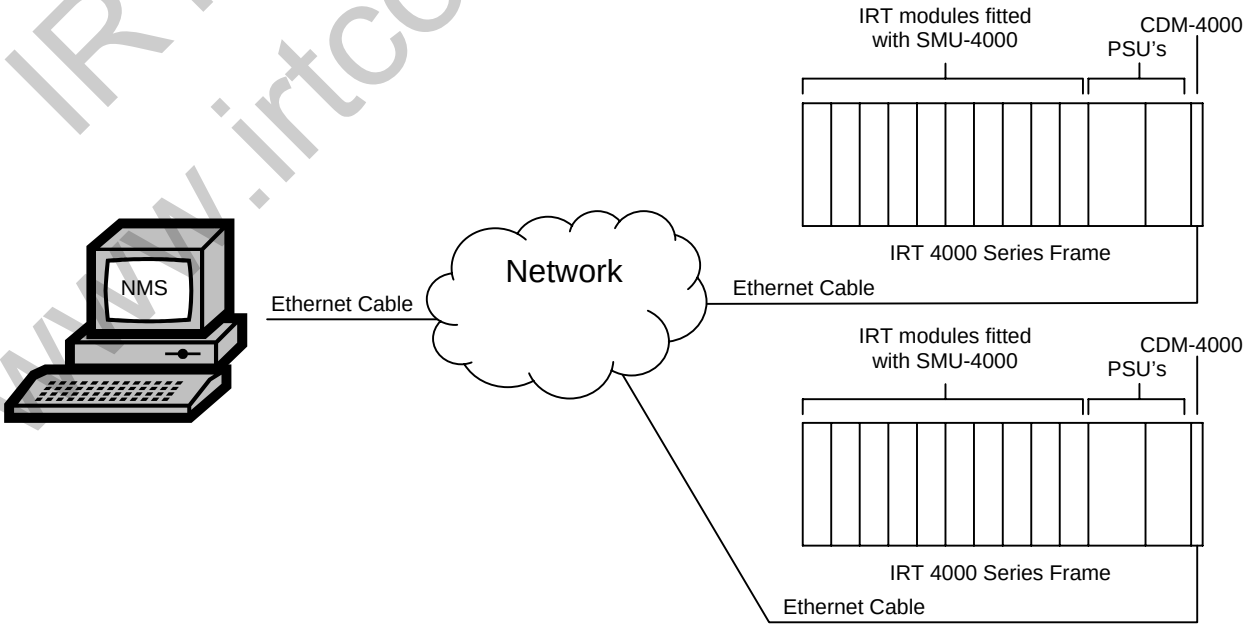
Frame parameters, such as Name, Address and Location, are set via an RS232 interface, a D9 connector on the rear of the frame below the mains inlet. A software terminal emulator, such as Tera Term or HyperTerminal, is used for setting and reading the parameters of the frame.

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

MDD-4490 SNMP Functions:

With the MDD-4490 installed in an IRT 4000 series frame with SNMP capability, the MDD-4490 can be interrogated by an SNMP Network Management System (NMS).

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

The current state of the “Urgent” and “Non Urgent” Alarms;
An indication that an ASI input signal is present;
The stream identification of the current input signal;
An indication that the Program Allocation Table (PAT) is present;
An indication that the Program Map Table (PMT) is present;
An indication that the Program Clock Reference (PCR) is present;
An indication that the Stream ID of the incoming signal matches that set on the local SID switches;
An indication that a Program with the number that is set on the local Program switches is present in the input;
An indication that a continuity count error has occurred;
An indication of the number of bytes in a packet;
An indication that the Packet is Burst mode or Distributed;
The setting of the switches to which the incoming Stream ID will be compared;
The setting of the switches to which the Program Number will be compared;
Whether “Trap” function is enabled;
Trap automatically sent, if enabled, on “Urgent” alarm;
Trap automatically sent, if enabled, if “Urgent” alarm clears;
Trap automatically sent, if enabled, on “Non Urgent” alarm;
Trap automatically sent, if enabled, if “Non Urgent” alarm clears;
The software version of the FPGA; and
Unit reset control.

Installation

Pre-installation:

Handling:

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

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

Power:

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

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

Earthing:

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

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

Installation in frame or chassis:

See details in separate manual for selected frame type.

Signal Inputs:

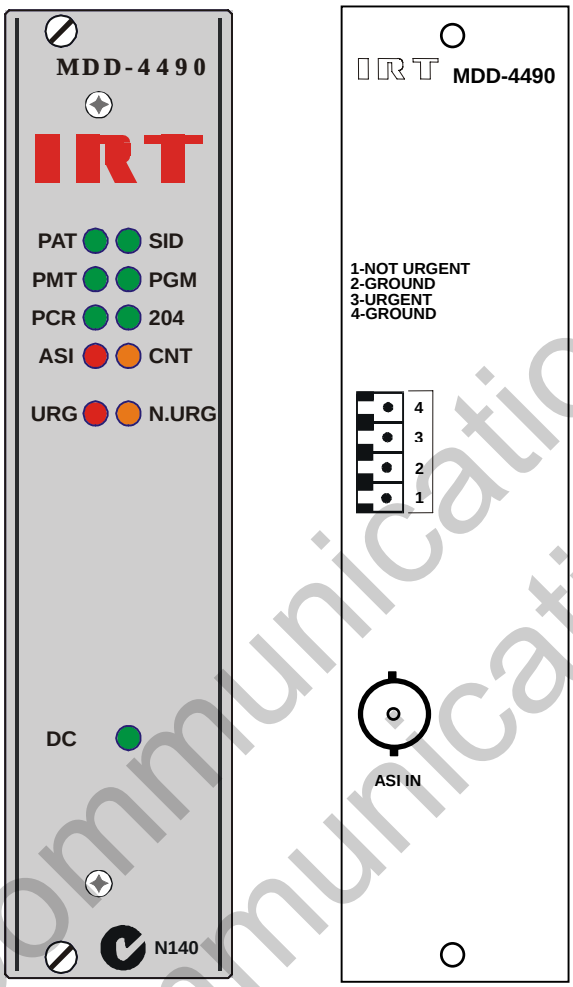
An ASI signal to be monitored is connected to the BNC connector on the rear of the rear connector assembly. For configuration of the MDD-4490 to match selected operating alarm states, see the configuration section of this manual.

Alarm Outputs:

Two relay alarm outputs, non-urgent and urgent, are via PL1, a 4 pole Phoenix style screw terminal block, on the rear connector assembly. Pin 1 switches to ground when a non-urgent alarm status has been raised. Pin 3 switches to ground when an urgent alarm status has been raised. Pins 2 and 4 are grounds. Front panel LEDs also light up when either of these alarm states has been raised.

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.



ETR290 Conformance Table

ASI 1.1 TS_sync_loss

Loss of synchronisation

1.2 Sync_byte_error

There were consecutive missing Packet Sync bytes (0x47).

PAT 1.3 PAT_error

PID 0x0000 occurred at least once in the last 0.5 seconds, and.
All packets with PID 0x0000 had a table_id of 0x00, and.
Scrambling_control_field was 00 for PID 0x0000.

CNT 1.4 Continuity_count_error

The Continuity counter for the PAT packet did not increase by one.
The Continuity counter for the PMT packet did not increase by one.
The Continuity counter for the PCR packet did not increase by one.

PMT 1.5 PMT_error

A PMT packet for the preset Program Number occurred at least once in the last 0.5 seconds, and
The PMT packet had 00 in its Scrambling_control_field , and
The PMT packet had a Table_id of 0x02.

PCR 2.3 PCR-error

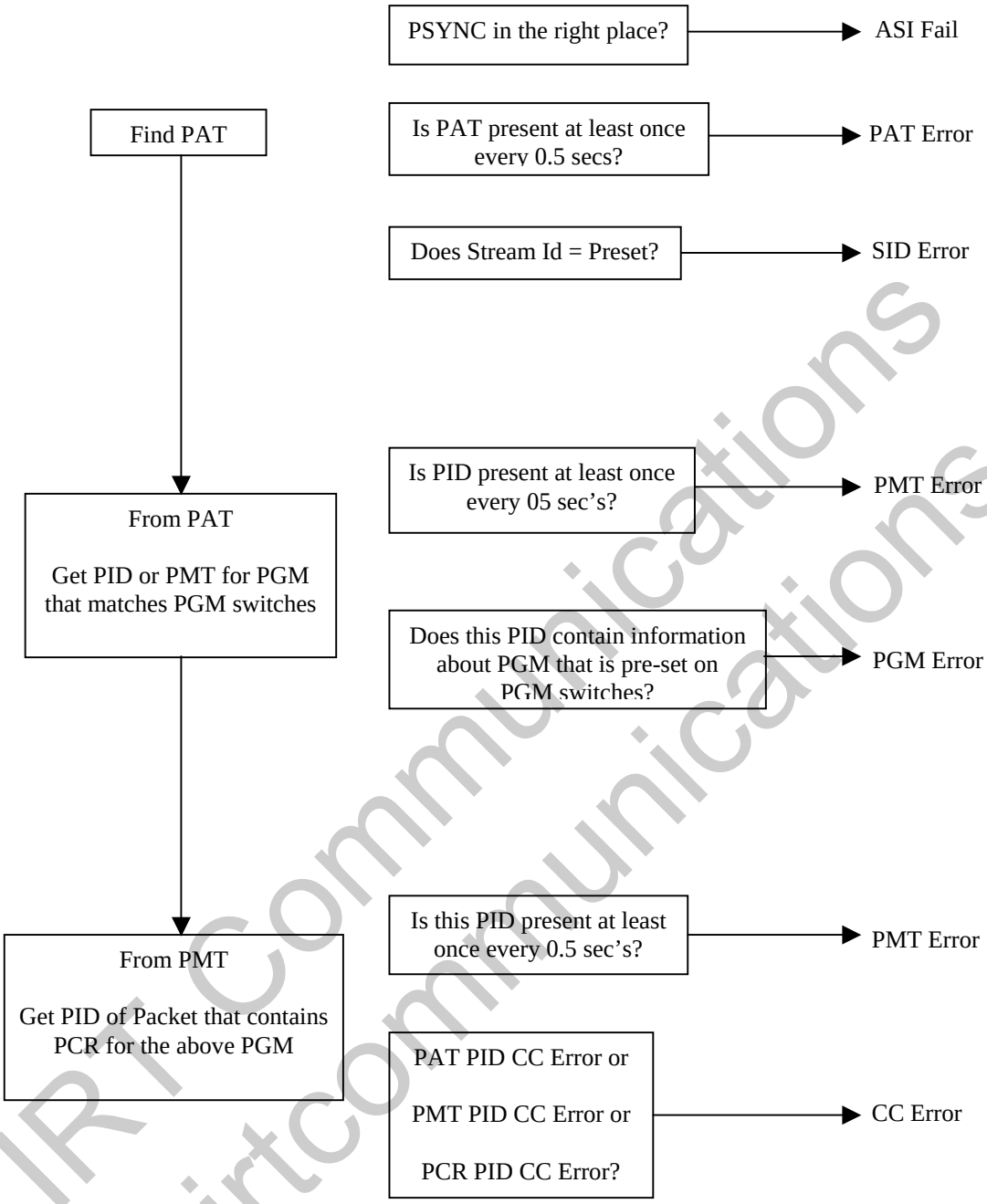
A PCR packet for the preset Program Number occurred at least once in the last 0.5 seconds.

PGM

The referenced PMT packet did contain the preset Program Number.

SID

The Stream_id of the TS equals that that is preset on the TS_ID switches.



PAT	Program Association Table
PSYNC	Packet Sync
PID	Packet Identification
PMT	Program Map Table
PGM	Program
PCR	Program Clock Reference
CC	Continuity Counter

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.

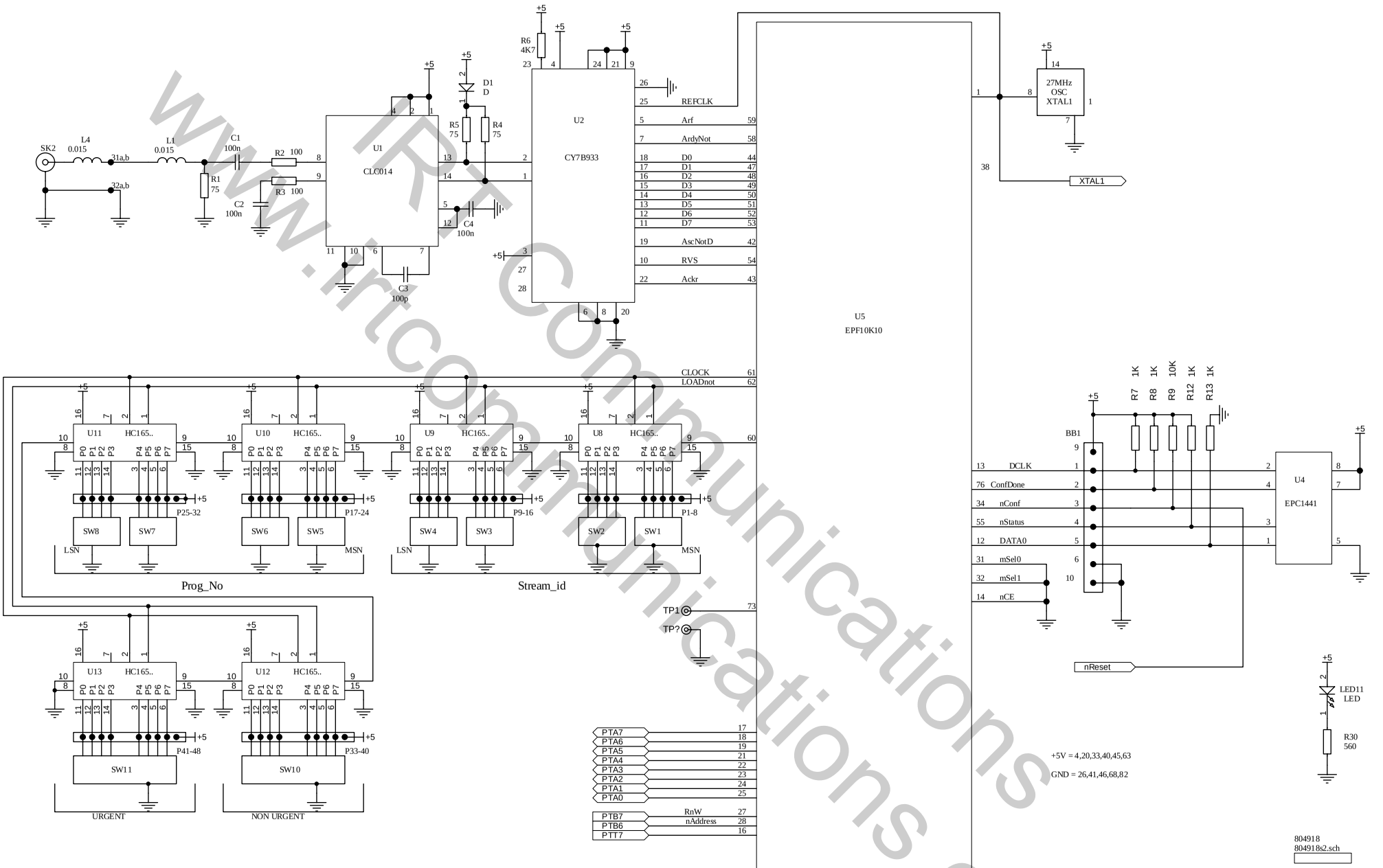
The equipment should be returned **to the agent who originally supplied the equipment or, where this is not possible**, to IRT direct as follows.

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
804918	1	MDD-4490 circuit diagram - sheet 1.
804918	2	MDD-4490 circuit diagram - sheet 2.



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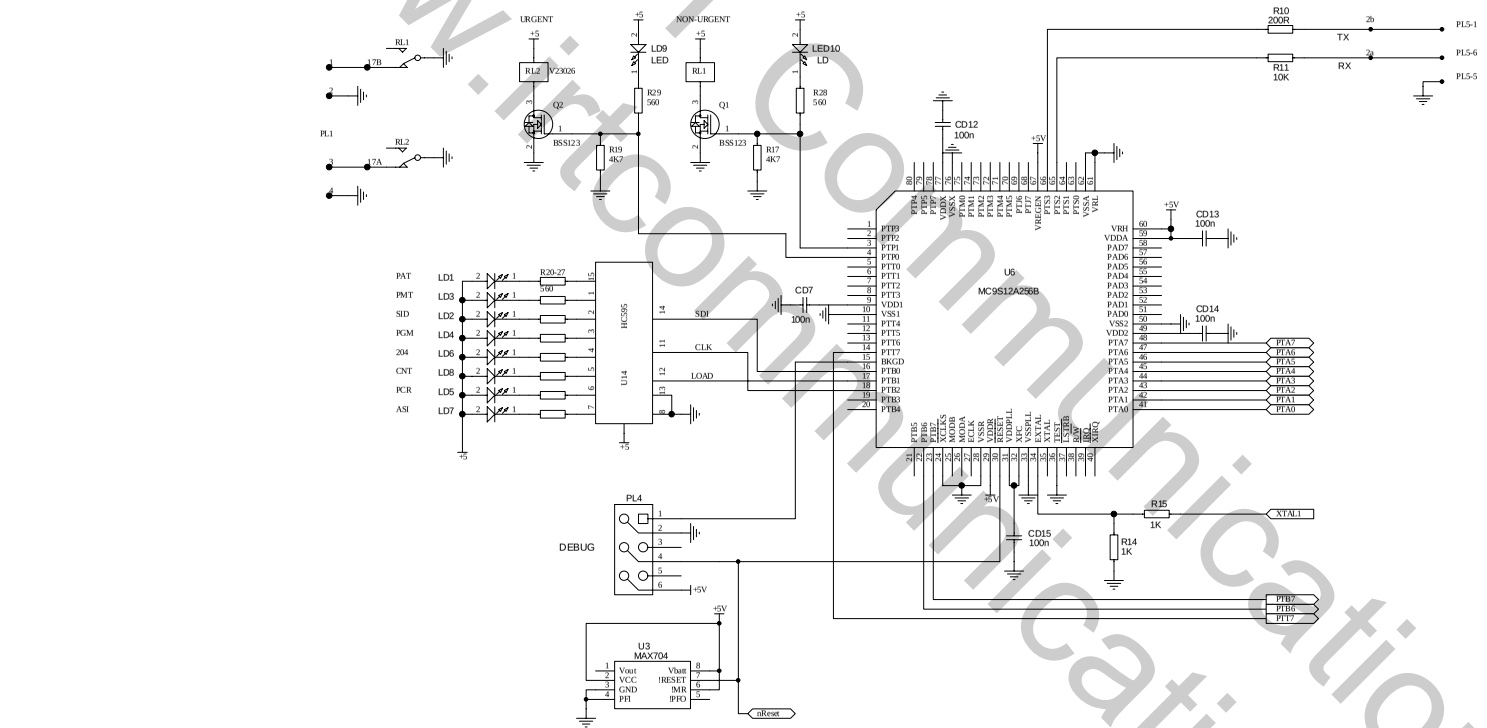
ENG. APP.			
Revision:	IRT Electronics Pty. Ltd. ARTARMON NSW AUSTRALIA 2064		
Date: 31-Mar-2005			



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ENG.APR.	SCALE N.T.S.	Drawing No. 804918 — Sheet 2 of 2
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Date: 31-Mar-2005	ARTARMON NSW AUSTRALIA 2064	