MDC-4910

SMPTE-310 to ASI Network Interface Adapter

User Manual

Revision History:

Revision	Date	By	Change Description	Applicable to:
00	05/08/2010	AL	Original Issue.	Firmware version ≥ MDC4910F6V0S6V0
01	04/07/2012	AL	DIP Switch settings changed.	Firmware version ≥ MDC4910F6V0AS6V0

Table of Contents:

This instruction book applies to firmware version ≥ MDC4910F6V0AS6V0.

OPERATIONAL SAFETY

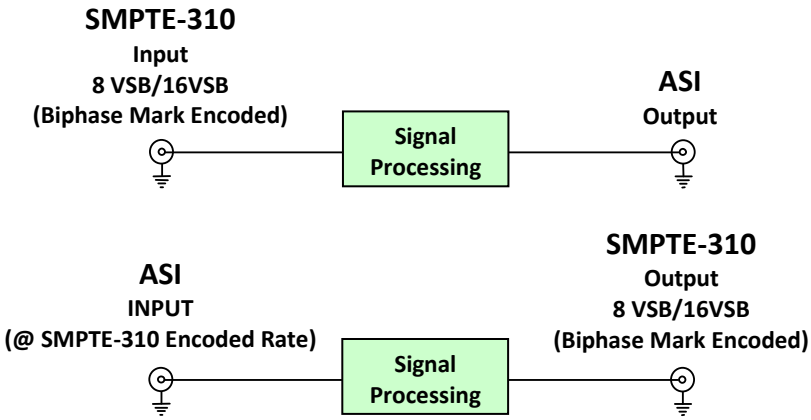
WARNING

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.

GENERAL DESCRIPTION

BLOCK DIAGRAM MDC-4910 SIGNAL PATH



The MDC-4910 is part of a family of network interface adapters for converting between the commonly used MPEG2 Transport Stream formats for video distribution in the broadcast industry.

With the MDC-4910 a SMPTE-310M type signal at either 8 VSB (19.393 Mb/s) or 16 VSB (38.785 Mb/s) rate is converted to an ASI type of signal for transport over an ASI link.

The MDC-4910 also does the reciprocal conversion from an appropriate ASI encoded signal back to the original SMPTE-310M signal.

The MDC-4910 can be used at either transmission end or receiving end. Both conversions operate independently from each other allowing the one card to be used in a bi-directional link.

ASI input[1] is automatically equalised for lengths of up to 200m of Belden 8281 or equivalent cable.

Front panel LEDs show when a valid SMPTE-310M signal or ASI signal is present and the rate at which it operates. A relay alarm indicates if there is an input data rate violation.

The MDC-4910 is designed to fit IRT's standard Eurocard frames and may be used alongside any other of IRT's Eurocards, as well as in conjunction with IRT's ASI interface cards.

Standard features:

- **SMPTE-310M to ASI, ASI to SMPTE-310M on the one card.**
- **ATSC rates of 8 VSB and 16 VSB supported.**
- **Automatic Input equalisation up to 200m.**

NOTE: 1 It is recommended that the SMPTE-310 input has a minimal cable length connected between it and the SMPTE-310 source to minimise input jitter (also applicable on output).

TECHNICAL SPECIFICATIONS

Inputs:

Type 1	1 x SMPTE-310M 75Ω, 800 mVp-p, BNC connector.
Data Rate	Biphase Mark encoded for 8 VSB (19.393 Mb/s), or 16 VSB (38.785 Mb/s).
Type 2	1 x ASI-C 75Ω @ SMPTE-310M encoded rate, 800 mVp-p, BNC connector.
Data Rate	8 VSB (19.393 Mb/s), or 16 VSB (38.785 Mb/s).
Equalisation[2]	Automatic, better than 200 metres at 270 Mb/s for Belden 8281 or equivalent cable.

Output:

Type 1	1 x 800mVp-p, ASI-C, 75 Ω BNC connector.
Type 2	1 x SMPTE-310M 75 Ω, 800 mVp-p, BNC connector.

Alarm Output:

MAJOR	Open circuit on loss of sync on serial (SMPTE-310M) input, or loss of power.
MINOR	Open circuit on no valid input ASI stream present, or loss of power.

Power Requirements:

Voltage	28 Vac CT (14-0-14) or ±16 Vdc.
Power consumption	6 VA.

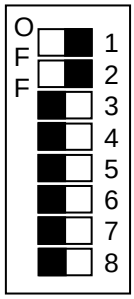
Other:

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.

NOTE: 2 It is recommended that the SMPTE-310 input has a minimal cable length connected between it and the SMPTE-310 source to minimise input jitter (also applicable on output).

CONFIGURATION

The only user settings on the MDC-4910 are on the DIP switch SW4 as shown below:



SW4-1 OFF - Major (Urgent) SNMP alarms to frame operational;
SW4-1 ON - Major (Urgent) SNMP alarms to frame non-operational[3].

SW4-2 OFF - Minor (Non-Urgent) SNMP alarms to frame operational;
SW4-2 ON - Minor (Non-Urgent) SNMP alarms to frame non-operational[3].

SW4-3 - Not used.

SW4-4 - Not used.

SW4-5 - Not used.

SW4-6 - Not used.

SW4-7 - Not used.

SW4-8 - Not used[4].

NOTE: 3 When using TRAPS via SNMP, depending on how system is set up, in order to avoid double reporting of alarms via the MDC-4910 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.

4 SW4-8 operational for both major and minor SNMP alarms with earlier version of firmware (MDC4910F6V0S6V0 – i.e. non 'A' version), where SW4-1 and SW4-2 are not used.

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 Connections:

SMPTE-310 Input:
The SMPTE-310 input port (SK10) on the rear assembly is a 75Ω terminated BNC connector for a SMPTE-310 encoded 8 VSB (19.393 Mb/s) or 16 VSB (38.785 Mb/s) signal only. Use of high quality 75Ω coaxial cable (Belden 8281 or equivalent) is recommended. Due to the nature of SMPTE-310 signals, to minimise input jitter it is recommended that only a short length of cable be used between the SMPTE-310 signal source and the MDC-4910 SMPTE-310 input.

ASI Output:
One ASI output (SK7) is provided as 75Ω output BNC connectors. The ASI output has a payload rate equivalent to the SMPTE-310 input rate, 8 VSB (19.393 Mb/s) or 16 VSB (38.785 Mb/s).

ASI Input:
The ASI input port (SK1) on the rear assembly is a 75Ω terminated BNC connector for an ASI encoded signal originally generated from the ASI output of a second (source) MDC-4910 unit. Use of high quality 75Ω coaxial cable (Belden 8281 or equivalent) is recommended.

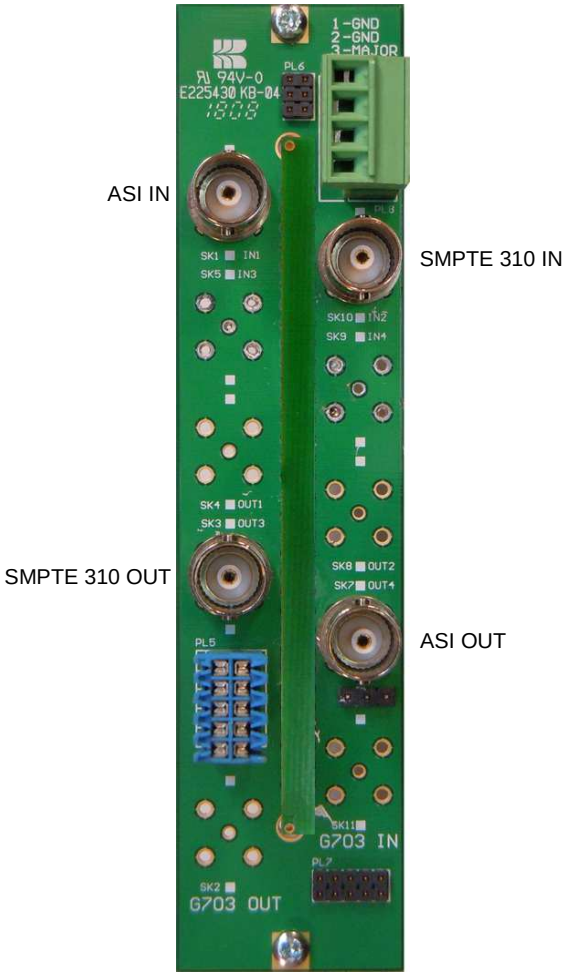
SMPTE-310 Output:
One SMPTE-310 output (SK3) is provided as 75Ω output BNC connectors. The SMPTE-310 output has a payload rate equivalent to the SMPTE-310 input rate of a second (source) MDC-4910 unit. Due to the nature of SMPTE-310 signals, it is recommended that only a short length of cable be used between the MDC-4910 output and the SMPTE-310 destination equipment.

Alarm Outputs:
Two relay alarm output states are provided via a phoenix style 4-pin plug. Pin 3 is designated as Major, pin 4 is designated as Minor, and both pins 1 & 2 are ground. Both alarms are referenced to ground.

Alarm conditions are as follows:

Major	Open circuit on loss of sync on serial (SMPTE-310M) input, or loss of power;
Minor	Open circuit on no valid input ASI stream present, or loss of power.

Front & rear panel connector diagrams:



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.

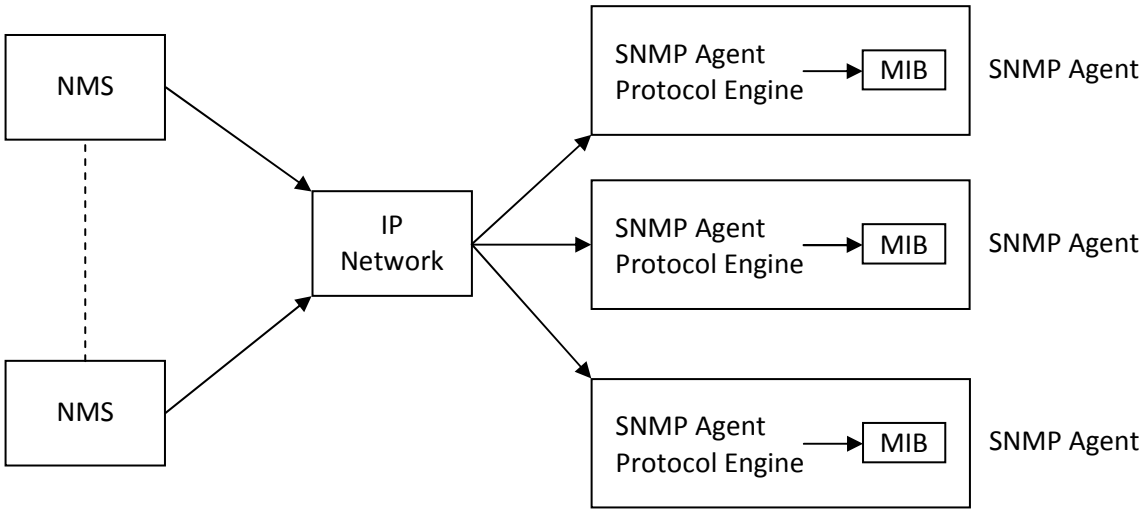
An *NMS* polls, or communicates with, an *agent.* An *agent* is a network management software module that resides in a *managed device.* An *agent* has local knowledge of management information and translates that information into a form compatible with SNMP. The *agent,* therefore, acts as an interface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

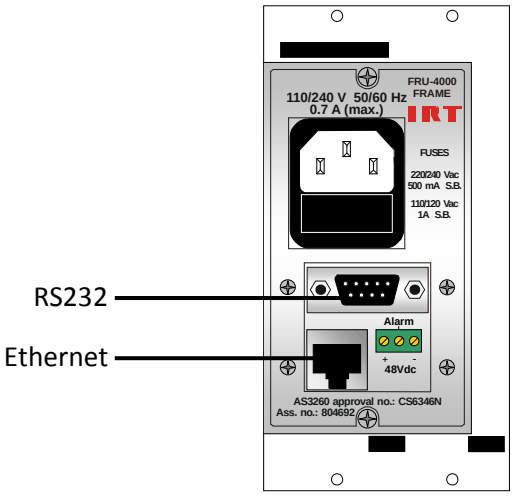
IRT Electronics currently employs SNMPv1 with its SNMP capable frames. The frame acts as an *agent* when fitted with a CDM-xxxx module. This module has its own designated slot next to the power supply so as to not affect the number of modules that the frame will take. Communication between the *NMS,*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

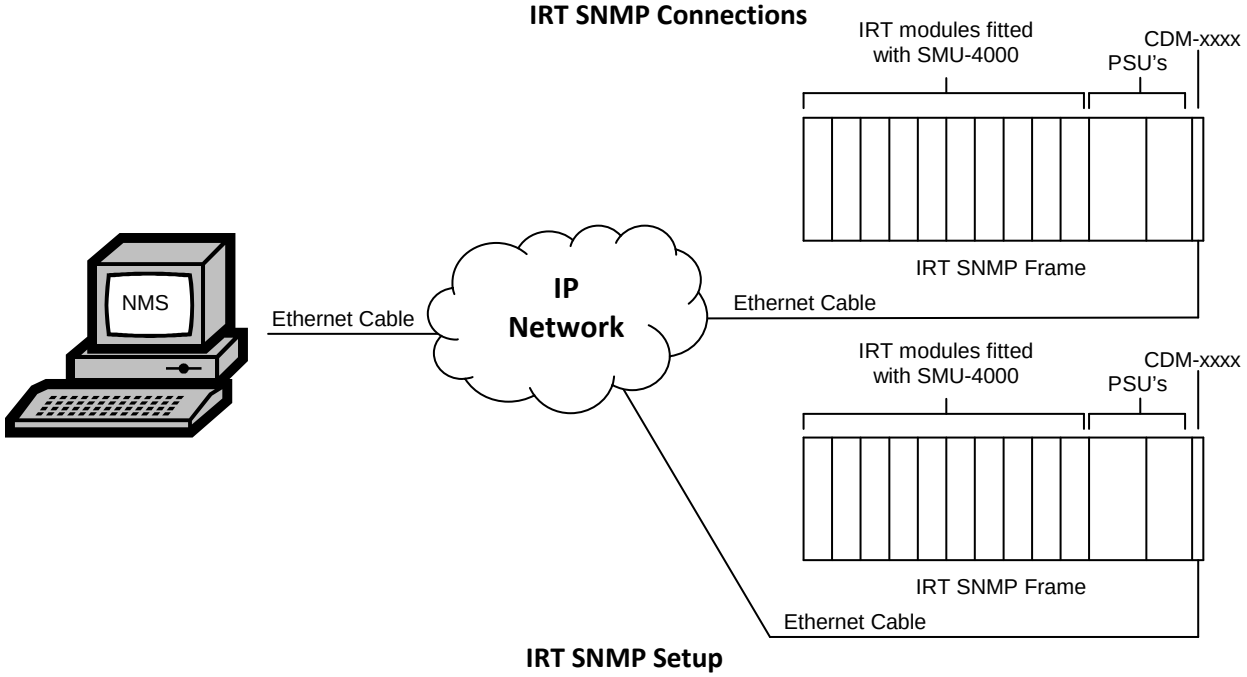
Frame parameters, such as Name, Address and Location, are set via an RS232 interface, a D9 connector on the rear of the frame below the mains inlet. A software terminal emulator, such as Tera Term or HyperTerminal, is used for setting and reading the parameters of the frame.

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

MDC-4910 SNMP Functions:

With the MDC-4910 installed in an IRT frame with SNMP capability, the following SNMP functions are capable of being controlled and monitored by an SNMP Network Management System (NMS):

presASI	- An indication of the current state of the ASI input, [notpres (1), present (2), pres8VSBrate (3), pres16VSBrate (4)].
presSMPTE310	- An indication of the current state of the SMPTE310 input, [notpres (1), present (2), pres8VSBrate (3), pres16VSBrate (4)].
softwareVersion	- An indication of the software version in the format 'x.y', where x is the major revision number and y the minor.
firmwareVersion	- An indication of the firmware version of the main FPGA in the format 'x.y', where x is the major revision number and y the minor.
reset	- Unit reset control. A set with a value of 2 sent to this OID will cause a system reset to occur. When queried returns 0.
presASITrapEnable	- Enable or Disable Traps to be sent when the status of the presASI variable changes, [notEnable (1), enabled (2)].
presSMPTE310TrapEnable	- Enable or Disable Traps to be sent when the status of the presSMPTE310 variable changes, [notEnable (1), enabled (2)].

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 directly. Details of IRT's direct address can be found at IRT Electronics' website.

Web address: www.irtelectronics.com

Email: sales@irtelectronics.com