# DENSITÉ series

# SCO-1421
## Intelligent ASI Change-Over with Probing
## Guide to Installation and Operation

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## Electromagnetic Compatibility

FC This equipment has been tested for verification of compliance with FCC Part 15, Subpart B requirements for Class A digital devices.

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**NOTE:** This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

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CE This equipment has been tested and found to comply with the requirements of the EMC directive 2004/108/CE:

- EN 55022 Class A radiated and conducted emissions
- EN 61000-3-2 Harmonic current injection
- EN 61000-3-3 Limitation of voltage changes, voltage fluctuations and flicker
- EN 61000-4-2 Electrostatic discharge immunity
- EN 61000-4-3 Radiated electromagnetic field immunity – radio frequencies
- EN 61000-4-4 Electrical fast transient immunity
- EN 61000-4-5 Surge immunity
- EN 61000-4-6 Conducted emissions immunity
- EN 61000-4-11 Voltage dips, short interruptions and voltage variations immunity

**How to contact us:**

For technical assistance, please contact the Miranda Technical support center nearest you:

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SCO-1421

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# 1  SCO-1421 Intelligent ASI Change-Over with Probing

## 1.1  Introduction

The SCO-1421 is a 2x1 intelligent ASI change-over with built-in MPEG-TS probing. Changeovers are performed electronically by the SCO-1421's internal router. In the event of a power failure, the signal is protected by relays fitted on the rear module, maintaining the integrity of the selected signal at the output.

Input selection can be performed automatically or manually. In automatic mode, the card will perform smart input selection based on rules related to signal quality. In manual input selection mode, channel selection can be made from the Densité controller, the iControl software, or simply by using a GPI. A GPI can be connected to an automation system or any simple GPI control panel. The GPI outputs give status of the selected source, allowing tallies to be triggered.

The card comes with sync-loss-free switching that prevents sync loss or sync drop errors upon switching.

MPEG-TS signal probing monitors PID presence of up to 12 services per input simultaneously.  In the event of a loss of data on any service PID, the SCO can be configured to automatically switch to the other input provided it is error-free.

The optional advanced probing option enables full level 1 & 2 TR 101 290 probing and alarming. Combined with the optional advanced probing, the SCO-1421 is not only the perfect ASI change-over but also a handy TS probe.

## 1.2  Features

- Two DVB-ASI source inputs and two DVB-ASI outputs (program and preview)
- Electronic switching with relay back up (on rear module) maintains selected input in the event of a power failure
- Automatic switch mode ruled by internal TS probes
- Manual changeover by local frame controller, iControl, iControl Solo or GPI
- GPI in for control & out for status monitoring  (IN1, IN2, AUTO, BYPASS)
- Switching without TS sync loss errors
- Alarm reporting to iControl monitoring and control system

**MPEG-TS signal Analysis**
- Probing of up to 12 services
- SI Table structure display
- PID presence alarming
- Total bit rate monitoring & alarming
- Service PID bit rates measurements
- Basic TR 101 290 probing and alarming:
  - ts_sync_loss
  - countinuity_count_error
  - sync_byte_error
  - transport_error

**Optional advanced probing**
- PSIP Table PID presence alarming
- Individual PID bit rate monitoring and alarming
- Teletext/subtitling PID presence alarming
- Probing for complete TR 101 290 L1 & L2 probing:
  - CAT_Error
  - CRC_Error
  - PAT_Error
  - PMT_Error
  - PCR_Accuracy
  - PCR_Error
  - PTS_Error
  - PID_Error

## 1.3 Block Diagram

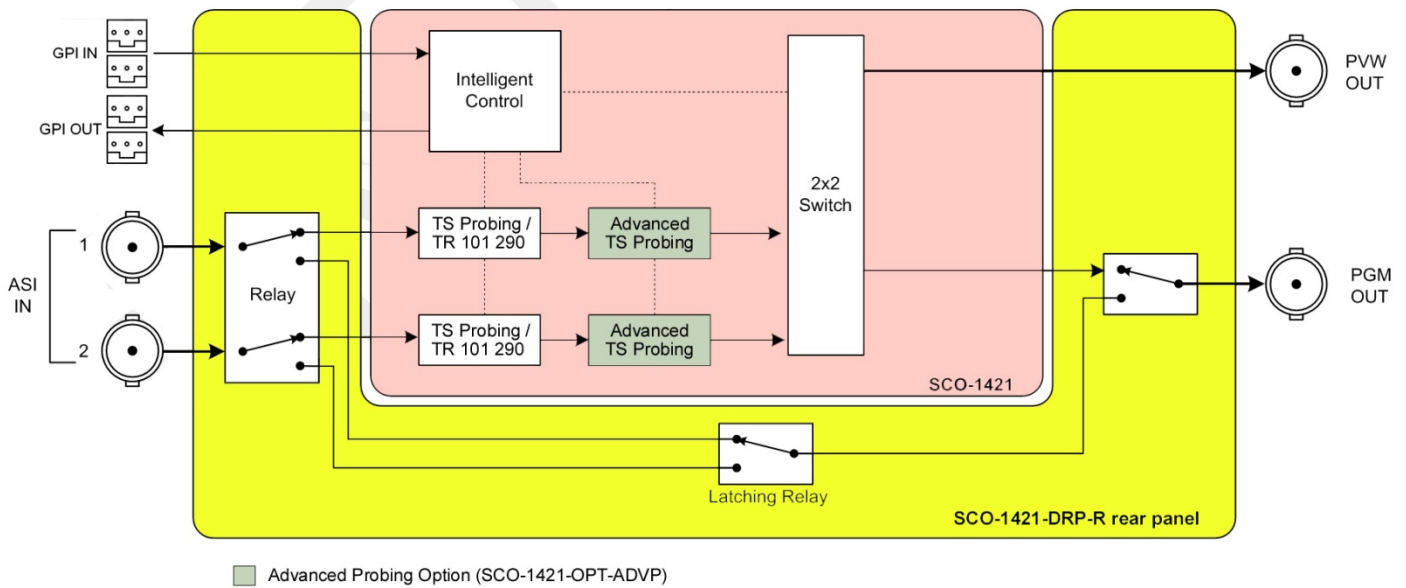The following block diagram shows the functionality of the SCO-1421.



***Figure.1.1*** *Functional block diagram SCO-1421*

## 1.4 Front Card-edge Interface

The front card-edge of the SCO-1421 incorporates two elements:

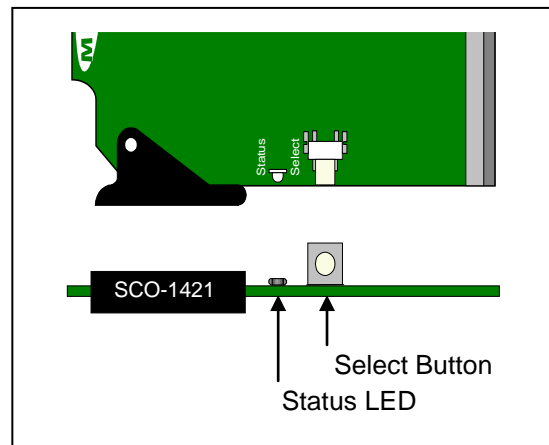- Status LED (see section 3.3)
- Select Button (see section 3.4)



***Figure 1.2*** *Front Card-edge Layout*

# 2   Installation

## 2.1   Unpacking

Make sure the following items have been shipped with your SCO-1421. If any of the following items are missing, contact your distributor or Miranda Technologies Inc.

- SCO-1421 Intelligent ASI Change Over with Probing
- SCO-1421-DRP-R Rear Panel (see figure 2.1)

## 2.2   Installation in the Densité frame

The SCO-1421 and its associated rear connector panel must be mounted in a DENSITÉ frame.  It is not necessary to switch off the frame's power when installing or removing the card. See the DENSITÉ Frame manual for detailed instructions for installing cards and their associated rear panels.

## 2.3   Rear Panel Connectors

The SCO-1421 has multiple inputs and outputs, and making space for all the necessary connectors at the rear of the frame requires a double-width rear panel.

With the double-width rear panel installed, the SCO-1421 must be installed in the right-most of the two slots covered by the panel in order to mate with the panel's connectors.

If it is placed in the wrong slot, the front panel LED will flash red. Move the card to other slot for correct operation. No damage will result to the card should this occur.
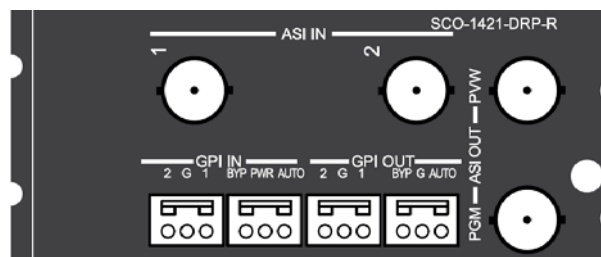


**Figure 2.1**  *SCO-1421-DRP-R  Rear Panel*

The rear panel connections are as follows:

**ASI IN 1 and ASI IN 2– serial digital ASI input**

Connect two DVB-ASI video signals, conforming to EN 50083-9, to the BNCs labeled **ASI IN 1 and 2**.

**ASI OUT – serial digital video outputs**

The SCO-1421 provides two ASI video outputs on BNC connectors, labeled **PGM** (program) and **PVW** (preview). The ASI video signals conform to EN 50083-9.

**GPI IN and GPI OUT connectors**

The rear panel of the SCO-1421 includes a GPI interface that allows control of the switch process.

When constructing and using an external GPI box, be aware of the following:

1.  The SCO-1421 card monitors the external power supply voltage on the GPI input. If the voltage is less than 4V (per relay datasheet), an alarm will be raised.
2.  When a GPI INPUT is triggered while the card is operating in auto mode, the card changes to manual mode and switches to the input selected by the GPI.
3.  DO NOT TRIGGER BOTH GPI INPUTS AT THE SAME TIME OR ALLOW THE TRIGGER PULSES TO OVERLAP, AS DAMAGE TO THE RELAY MAY RESULT.
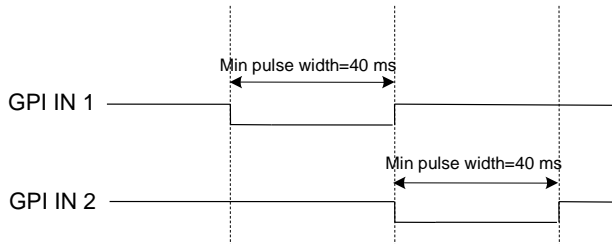4.   A GPI trigger pulse should have a duration of at least 40 ms.



***Figure 2.2***  *GPI trigger pulse timing*

### Using the GPI interface

-    Trigger the GPI-IN-1 or GPI-IN-2 pin to select that input.
-   Trigger the AUTO-IN or BYPASS-IN pin to select that mode
-   Read the GPI-OUT-1 and GPI-OUT-2 pins to identify which output is selected
-   Read the AUTO-OUT and BYPASS-OUT pins to determine whether either of these modes is in operation.

| WECO connector | Pin number | GPI direction | GPI name |
|---|---|---|---|
| P1 | 1 | IN | GPI-IN-1 |
| | 2 | GND | |
| | 3 | IN | GPI-IN-2 |
| P3 | 1 | IN | AUTO-IN |
| | 2 | External +5V | |
| | 3 | IN | BYPASS-IN |
| P4 | 1 | OUT | GPI-OUT-1 |
| | 2 | GND | |
| | 3 | OUT | GPI-OUT-2 |
| P5 | 1 | OUT | AUTO-OUT |
| | 2 | GND | |
| | 3 | OUT | BYPASS-OUT |

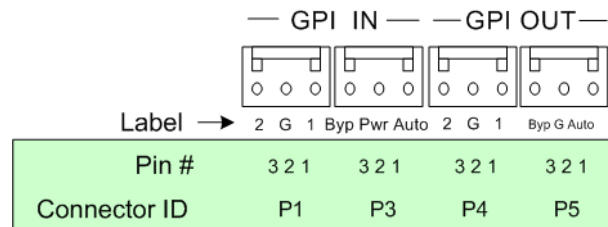The four GPI connectors are laid out as shown:



***Figure 2.3***  *GPI Connectors*

# 3 Operation

## 3.1 Getting Started

- The switch mode is set to AUTO by default which means the card will automatically switch to the input with the less errors based on the error configuration that has to be done in the ALARM tab.  Don't forget to change this setting if you don't want the card to switch by itself.

- When in AUTO mode, the switch conditions must be set by the user as desired as most of them are set to OFF by default.  The LEVEL parameter of the measures that should cause a switch when error occurs must be set to 1 or 2 according to the priority (1 being the most critical) or the card will never switch by itself.

- If the preview output of the card is connected, do not forget to set it's behavior as desired on the preview output tab.

- As it is NOT possible to probe every program present in the stream, many of the TR 101 290 measures are only done on the *programs* selected for probing.  It is very important to select the programs that you wish to probe (up to 12) under the "Service Presence X" item in the ALARM – TS tab.  Without doing so, many measures indicators will always be green and won't work as expected.  The Pie Chart and PID Presence display reporting depend also on this Service Presence setting.

- Once configured and fed with a valid signal, it is a good idea to reset the error count under the PROBING - TR101290 tab if you want to clear the errors that might have occurred during configuration.

## 3.2 Control options

The SCO-1421 can be controlled in two different ways:
- The local control panel and its push-buttons can be used to move through a menu of parameters and to adjust parameter values (see section 3.4).
- Miranda's iControl system can be used to access the card's operating parameters from a remote computer, using a convenient graphical user interface (GUI). (see section 3.5)

## 3.3 Card-Edge Status LED

The status monitor LED is located on the front card-edge of the SCO-1421, and is visible through the front access door of the DENSITÉ frame. This multi-color LED indicates the status of the SCO-1421 by color, and by flashing/steady illumination.

The chart shows how the various error conditions that can be flagged on the SCO-1421 affect the LED status.
- If a cell is gray, the error condition cannot cause the LED to assume that status
- If more than one LED status is possible for a particular error condition, the status is configurable. See Section 3.5.8 for details.
- The factory default status is shown by a ✪

The LED will always show the most severe detected error status that it is configured to display, and in the chart error severity increases from left to right, with green representing no error/disabled, and flashing red the most severe error.

| Error Condition | LED Status | | | |
|---|---|---|---|---|
| | Green | Yellow | Red | Flashing Red |
| No errors | ✪ | | | |
| TS Presence Input 1 | | | ✪ | |
| TS Presence Input 2 | | | ✪ | |
| Transport ID Mismatch Input 1 | | | ✪ | |
| Transport ID Mismatch Input 2 | | | ✪ | |
| Total Bit Rate Input 1 | | | ✪ | |
| Total Bit Rate Input 2 | | | ✪ | |
| Bypass Enabled | | | ✪ | |
| Backup Used | | | ✪ | |
| Global Level 1 for Input 1 | | | ✪ | |
| Global Level 2 for Input 1 | | | ✪ | |
| Global Level 1 for Input 2 | | | ✪ | |
| Global Level 2 for Input 2 | | | ✪ | |
| Limitation Alarm | | | ✪ | |
| GPI Power Alarm | | | ✪ | |
| Hardware Failure | | | | ✪ |
| Rear Presence | | | | ✪ |

If the LED is Flashing Yellow, it means that the card is selected for local control using the Densité frame's control panel. See Section 3.4 for details.

## 3.4   Local control using the Densité frame control panel

### 3.4.1   Overview

Push the SELECT button on the SCO-1421 card edge (see Section 1.4) to assign the local control panel to operate the SCO-1421. Use the control panel buttons to navigate through the menu, as described below.

All of the cards installed in a Densité frame are connected to the frame's controller card, which handles all interaction between the cards and the outside world. There are no operating controls located on the cards themselves. The controller supports remote operation via its Ethernet ports, and local operation using its integrated control panel.

The local control panel is fastened to the front of the CPU-ETH2 controller card, and when installed can be accessed by opening the front door of the frame. The panel consists of a display unit capable of displaying two lines of text, each 16 characters in length, and five pushbuttons.

The panel is assigned to operate any card in the frame by pushing the SELECT button on the front edge of that card.

- Pushing the CONTROLLER button on the control panel selects the Controller card itself.

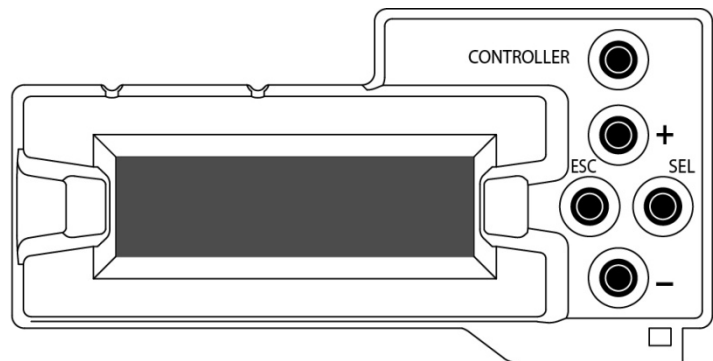- The STATUS LED on the selected card flashes yellow

*Figure 3.1* Densité Frame local control panel

The local control panel displays a menu that can be navigated using the four pushbuttons located beside the display. The functionality of the pushbuttons is as follows:

[+]  [–]      Used for menu navigation and value modification

[SELECT]   Gives access to the next menu level. When a parameter value is shown, pushing this button once enables modification of the value using the [+] and [–] buttons; a second push confirms the new value

[ESC]      Cancels the effect of parameter value changes that have not been confirmed; pushing [ESC] causes the parameter to revert to its former value.

Pushing [ESC] moves the user back up to the previous menu level. At the main menu, [ESC] does *not* exit the menu system. To exit, re-push the [SELECT] button for the card being controlled.

If no controls are operated for 30 seconds, the controller reverts to its normal standby status, and the selected card's STATUS LED reverts to its normal operating mode.

## 3.4.2   Menu for local control

The SCO-1421 has operating parameters which may be adjusted locally at the controller card interface.

- Press the SELECT button on the SCO-1421 front card edge to assign the Densité frame's local control panel to the SCO-1421
- Use the keys on the local control panel to step through the displayed menu to configure and adjust the SCO-1421.

The complete menu structure is shown in the Annex to this document, beginning on page 37.

## 3.5   Remote control using iControl

The operation of the SCO-1421 may be controlled using Miranda's iControl system.

- This manual describes the control panels associated with the SCO-1421 and their use.
- Please consult the iControl User's Guide for information about setting up and operating iControl.

In iControl Navigator or iControl Websites, double-click on the SCO-1421 icon to open the control panel.

### 3.5.1   The iControl graphic interface window

The basic window structure for the SCO-1421 is shown in figure 3.2. The window identification line gives the card type (*SCO-1421*) and the slot number where the card installed in its Densité frame.
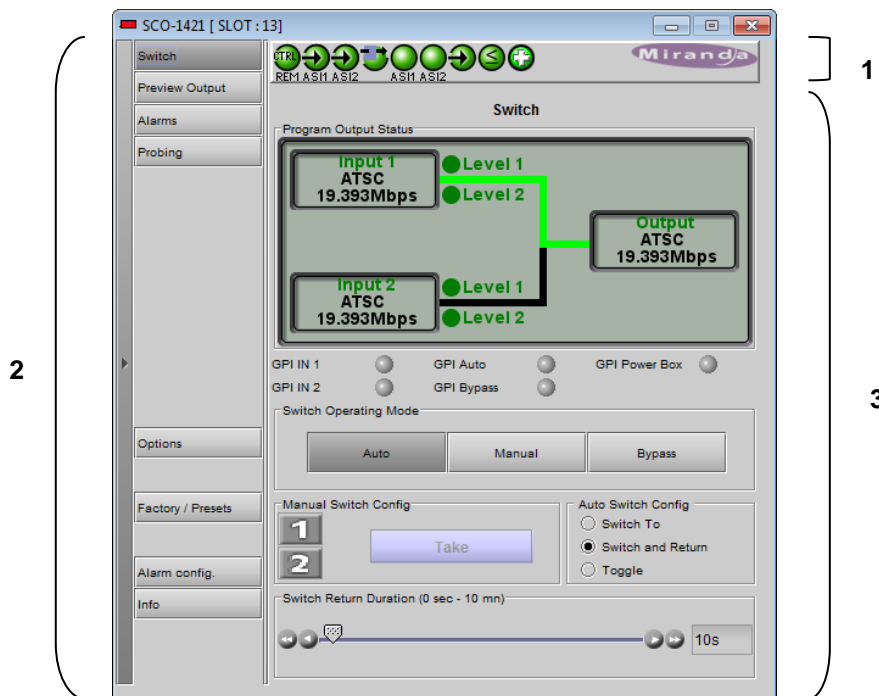
**Figure 3.2** *SCO-1421 iControl graphic interface window*

There are three main sections in the window itself, identified in figure 3.2:

**1.** The Status Icon area shows a series of nine icons that report the status of some card parameters. Figure 3.3 shows the various forms that may appear; their meaning is described below.

Icon 1 – Control status
- A:  Green - Remote Control via iControl
- B:  Yellow - Local control using the menu

Icon 2 – ASI 1 Presence
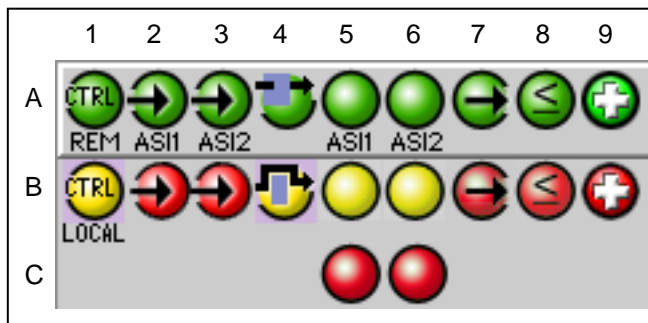- A: Green – ASI IN locked
- B: Red – No ASI IN detected

**Figure 3.3** *Status icons*

Icon 3 – ASI 2 presence
- A: Green – ASI IN locked
- B: Red – No ASI IN detected

Icon 4 – Bypass Mode Status
- A: Bypass not active – SCO-1421 in operation
- B: Bypass activated

Icon 5 – Global Alarm for Input 1 status
- A: Green – no alarm
- B: Yellow – Level 2 alarm
- C: Red – Level 1 alarm

Icon 6 – Global Alarm for Input 1 status
- A: Green – no alarm
- B: Yellow – Level 2 alarm
- C: Red – Level 1 alarm

Icon 7 – Backup status
- A: Green – Other input is backup in AUTO mode
- B: Red – Current input is backup in AUTO mode

Icon 8 – Probing Resources
- A: Green – Probing resources available
- B: Red – Probing limits reached  - The number of PIDs in the stream exceeds 127
  - The number of different programs in the stream exceeds 32
  - The number of PIDs in a single program exceeds 15
  - The number of different tables to collect in the stream exceeds 34

Icon 9 – Card Heath status
- A: Green – Hardware OK
- B: Red – Major hardware failure requiring factory repair

When an icon shows an error state, a message describing the error in more detail will appear beneath the icons. If there is more than one error, they will cycle through the display.
- If there are multiple errors, the error messages cycle so all can be seen
- The icon whose status or error message is shown is highlighted with a mauve background

In all cases, mousing over an icon will cause a more detailed description of its current status to appear in the message area. Error message cycling will resume when the cursor is no longer over an icon.

2. The left-hand side of the panel contains a series of buttons that control the contents of the main window (section 3). Click on one to access the indicated controls. The selected button is highlighted (darker) and the main panel heading matches the button name.

3. This section contains the main operating controls and displays for managing the SCO-1421's feature set. The contents are selected by clicking a button on the left-hand side of the screen.

The left side of the window, containing section 2, can be hidden or revealed by clicking the arrow icon at the center of the left side border. Each of the panels associated with the groups accessed from the buttons in Section 2, and shown in Section 3, is described individually in the following sections.

### 3.5.2 The *Switch* panel

The graphic at the top of the panel identifies the input that is currently selected, and indicates the validity of both inputs by the color of their icons.

The status of the four GPI inputs is shown below the graphic. These inputs select the operating mode when activated. The status of GPI power from the external GPI box is also shown. If this icon is *not* green, the GPI Power Box alarm will be raised. See section 2.3 for information about GPI usage in the SCO-1421.

The SCO-1421 has three mo des of switch operation, selected by clicking the appropriate button in the Switch Operating Mode section of the control panel.

- You will be asked to confirm that you want to change the switch operating mode when you click a button

1. Manual Switch

   Manually switches the SCO-1421 program output between the two possible sources: input 1 and input 2.

**Figure 3.4** *The Switch panel*

- Click the *Manual* button. The two sources are shown on the left. Look at the graphic at the top of the panel to see which one is currently selected.

- Click on the other source, which will then show in green. The Take button is now activated, appearing red (see figure 3.5).

- A countdown (from 10 seconds) underneath the Take button shows how long the Take button will remain active before it times out.

- Click the Take button while it is active to switch the SCO-1421 output over to the other source.
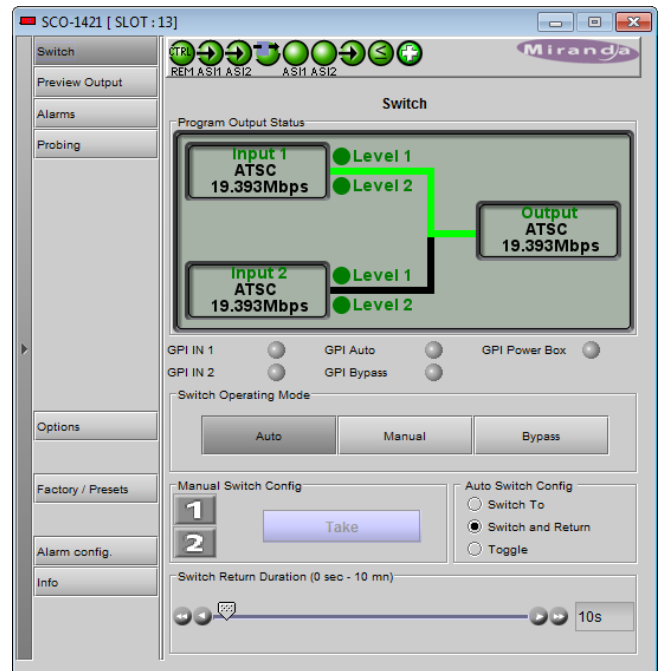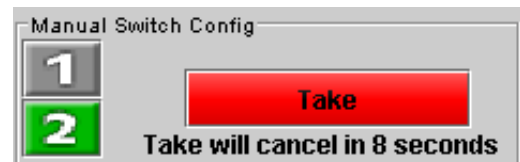
**Figure 3.5** *Manual Switch Controls*

2. Auto Switch

   The SCO-1421 uses its probing feature to determine a global alarm level for each of the two inputs (see section 3.5.4 for more information). Auto Switch uses this information to determine whether a changeover is required.

   - Generally speaking, the SCO-1421 will switch to the input with the lowest global alarm level, even if it is not error-free

   - The specific switching pattern is determined by the Auto Switch Configuration that has been selected

   Click the *Auto* button in the *Switch Operating Mode* area to activate the Auto mode.

   - When Auto mode is turned on, Input 1 is always selected as the source, so be aware that if you have selected input 2 manually and then switch ON the Auto mode, the selection will switch to Input 1.
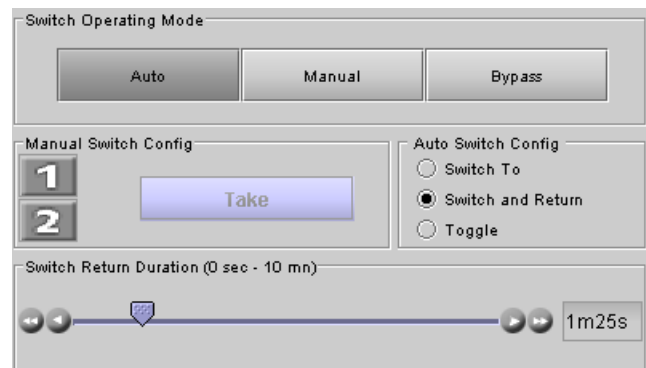
**Figure 3.6** *Auto Switch Mode*

In the *Auto Switch Config* area, select the Auto Switch mode of operation:

- *Switch To:* switches to input 2 when the alarm conditions trigger a switch. *NOTE that a return to input 1 can only be made in the Manual mode.*

- *Switch and Return:* switches to input 2 when the alarm conditions trigger a switch, and then switches back after a predetermined interval, counted from the time the input 1 global alarm becomes and remains equal to or lower than the input 2 global alarm. Use the *Switch Return Duration* slider at the bottom of the tab to set the interval (0 to 59 seconds, 1 to 10 minutes)

- *Toggle:* switches to the input that has the lowest global alarm level, with no delay. In this mode, neither input is favored, although it will start on input 1 when Auto mode is selected.

3. Bypass

Bypass triggers relays located on the rear panel to connect the inputs directly to the outputs. The bypassed SCO-1421 card is electrically disconnected from the Densité signal system, and can be removed from the frame with no discontinuity in the signal path.

When the SCO-1421 is in Bypass:

- There is no ASI probing
- The PVW (preview) output is disabled

**NOTE:** *Miranda recommends that you set the SCO-1421 in BYPASS before removing it from the Densité frame to ensure no disruption in the signal when the card is removed and reinserted.*

### 3.5.3 The *Preview Output* panel

Use this panel to select the source for the preview output

- Auto                             Opposite input from that selected for the Program output

- Input 1                          Input 1

- Input 2                          Input 2

- Follow Program Output:   Same input as selected for the Program output
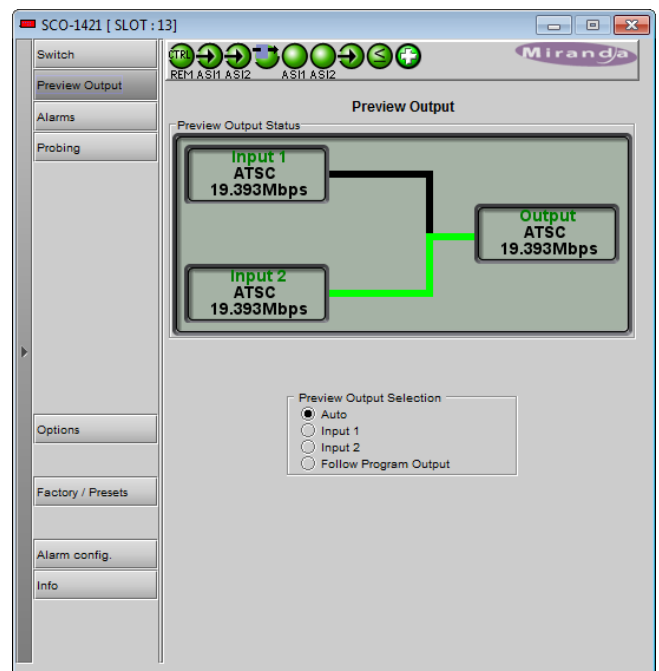


**Figure 3.7** *Preview output source selection*

### 3.5.4    The *Alarms* panel

The SCO-1401 continuously monitors the condition and status of the input signals it is processing. The information is used to decide whether the input must be switched in Auto mode. It is also used to flag the status of the card in the iControl system.

In general:

- A number of parameter values are continuously tested against user-defined thresholds or for presence/absence.
- Each parameter test is assigned a Level, to determine the extent to which it contributes to the changeover decision.

Many alarms can be enabled or disabled using the *Enable* checkbox in their control panel (see below).

An alarm that is enabled:

- contributes to the switch decision process based on its LEVEL.
- Is reflected in the device status as reported to iControl (LEVEL has no bearing on this)

Each alarm is assigned a LEVEL that determines its contribution to the switch decision process. Possible levels are:

- 1 – highest significance
- 2 – lower significance
- OFF – not used in the switch decision process

Some alarms are arbitrarily assigned as Level 1 and cannot be changed by the user (e.g. no signal present is always a Level 1 alarm). Their Enable checkbox is ticked, and greyed-out.

Other alarms have a pulldown in their control panel that allows the user to set the level.
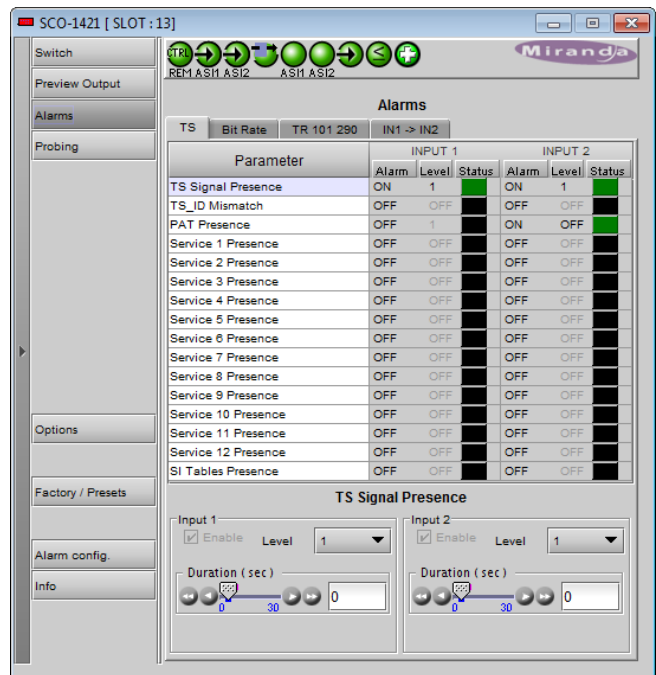


***Figure 3.8*** *Alarms panel*

The SCO-1421 uses the most significant alarm detected for an input as the global alarm level for that input, and then uses the truth table on the right to decide whether to switch from input 1 to input 2 and back. The switch pattern is determined by the Auto Switch mode that is selected; see section 3.5.2.

The Alarms section of the iControl panel gives access to all alarm-related settings.

- The *TS*, *Bit Rate* and *TR 101 290* tabs at the top of the panel give access to lists of the alarms that exist in that category
- All available alarms in the selected category are shown under Alarm Name, and the configuration and status of each alarm for Inputs 1 and 2 is shown to the right.
- Click on an alarm in the *Alarm Name* column to select it, and the configuration panel for that alarm appears at the bottom of the screen.

| INPUT 1 | | | INPUT 2 | | | OUTPUT: |
|---|---|---|---|---|---|---|
| Alarm level | | | Alarm level | | | SELECT INPUT # |
| 1 | 2 | | 1 | 2 | | |
| ○ | ○ | | x | x | | 1 |
| ○ | ● | | ○ | ○ | | 2 |
| ○ | ● | | ○ | ● | | 1 or last |
| ○ | ● | | ● | x | | 1 |
| ● | x | | ○ | ○ | | 2 |
| ● | x | | ○ | ● | | 2 |
| ● | x | | ● | x | | 1 or last |

| | | |
|---|---|---|
| ● | = | Alarm at this level |
| ○ | = | No Alarm at this level |
| x | = | Don't care |

### TS – TS signal presence

This error is always ENABLED and the level set to 1, 2 or OFF. The factory default value is level 1.

Use the slider to set the duration for which the error must continuously exist before the alarm is flagged. The nominal range of durations is 1 to 30 seconds.
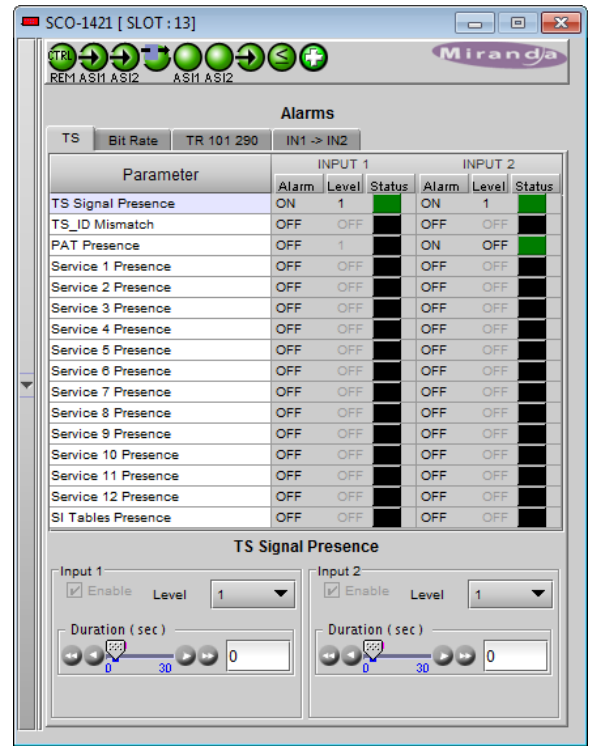


***Figure 3.9*** *TS Signal Presence alarm*

### TS – TS ID Mismatch

The Transport Stream ID for each of the two inputs, as detected by the on-board probing feature, is shown in the **Current** data box.

The user sets an expected or preferred Transport Stream ID for each input in the **Desired** data box:

- The data may be entered by clicking and typing in the data box
- The data in the Current data box may be copied over into the Desired data box by clicking on the arrow button between the two data boxes.

The SCO-1421 compares the Current and Desired TS IDs and flags an error if they do not match.

This error can be Enabled using the checkbox, and the level set to 1, 2 or OFF.
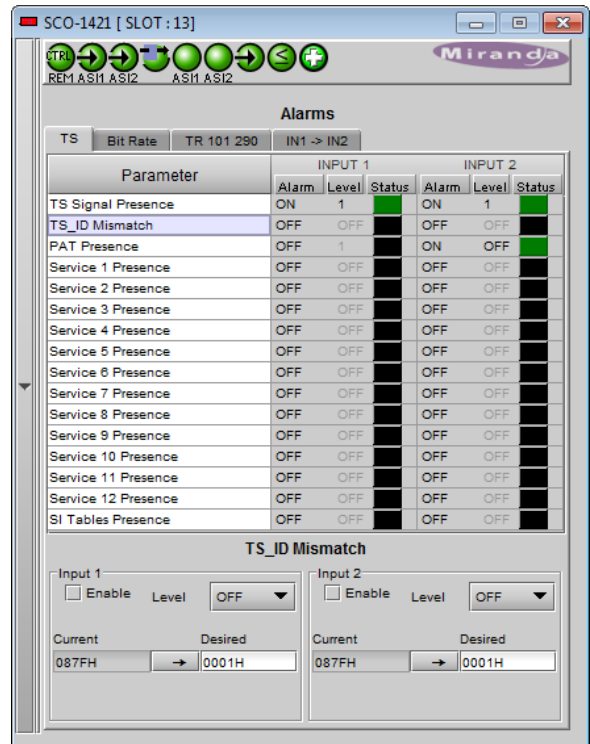


***Figure 3.10*** *TS_ID Mismatch alarm*

### TS – PAT Presence

This error is generated if the PAT (Program Association Table) of the input transport stream is continuously absent for a period greater than the time set in the Duration data box.

- The duration value may be entered by clicking and typing in the data box
- The duration data may be changed using the slider and control buttons on either end of it
- Duration range is 1 to 60 seconds
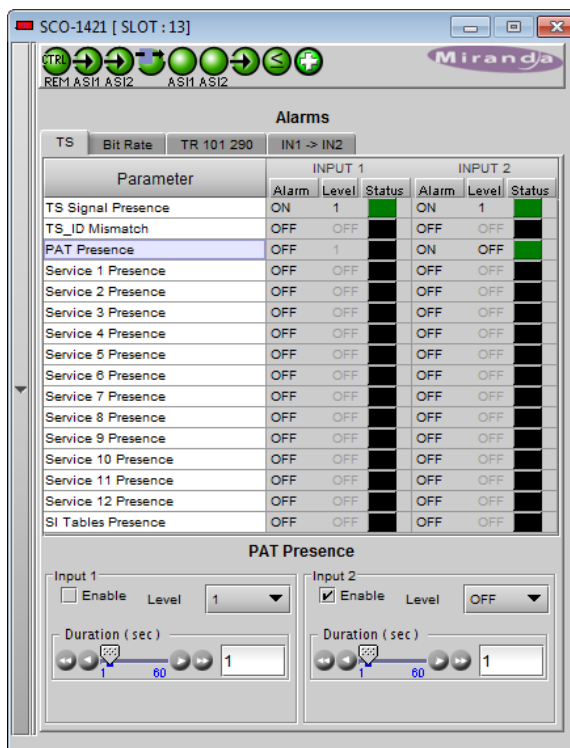
This error is Enabled using the checkbox, and the level set to 1, 2 or OFF.



**Figure 3.11** *TS – PAT Presence alarm*

### TS – Service N Presence (N = 1 to 12)

This error is generated if a PID (PMT, PCR, audio, video) in the service in the input transport stream that has been selected for probing is continuously absent for a period greater than the time set in the Duration data box.

- The duration value may be entered by clicking and typing in the data box
- The duration data may be changed using the slider and control buttons on either end of it
- Duration range is 1 to 60 seconds

This error is Enabled using the checkbox, and the level set to 1, 2 or OFF.

.

Select the service to be probed using the Browse button at the bottom of the panel. Clicking the button opens a list of all services detected in the incoming data stream. Each can be assigned to only one of the 12 available slots.
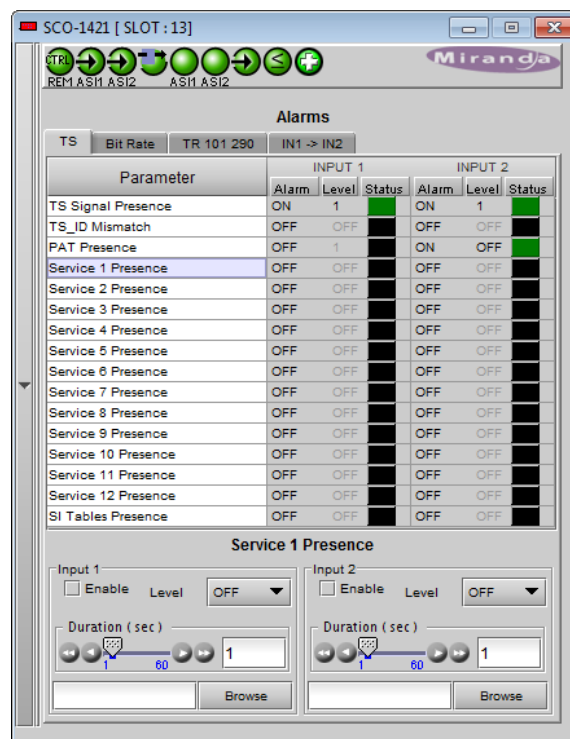


**Figure 3.12** *TS – Service Presence alarm*

### TS – SI Tables Presence

*(Only available when the Advanced Probing option is enabled)*

This error is generated if the Service Information tables in the input transport stream service that has been selected for probing are continuously absent for a period greater than the time set in the Duration data box.

- The duration value may be entered by clicking and typing in the data box
- The duration data may be changed using the slider and control buttons on either end of it
- Duration range is 5 to 60 seconds

This error is Enabled using the checkbox, and the level set to 1, 2 or OFF.

Select the stream type using the pulldown at the bottom of the panel. Options are:

- ISO13838    (use when no specific tables are present)
- ATSC         (use when searching for VCT and MGT)
- DVB           (use when searching for SDT, NIT and TDT)
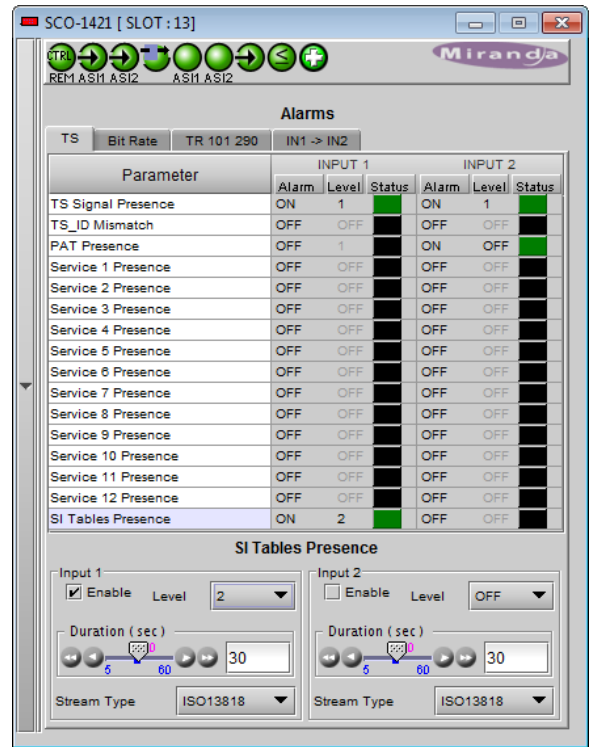


**Figure 3.13** *SI Tables Presence*

### Bit Rate – Total TS Bit Rate

This error is generated if the total bit rate of the input transport stream is continuously outside a specified range of values for a period greater than the time set in the Duration data box.

The **Current** value is detected by the on-board probing of the SCO-1421 and displayed in the Current data box.

The **Min** and **Max** values are determined by the user, and entered into the data boxes by clicking and typing.

The **Duration** is determined by the user:

- The duration value may be entered by clicking and typing in the data box
- The duration data may be changed using the slider and control buttons on either end of it
- Duration range is 0 to 60 seconds

This error is Enabled using the checkbox, and the level set to 1, 2 or OFF.
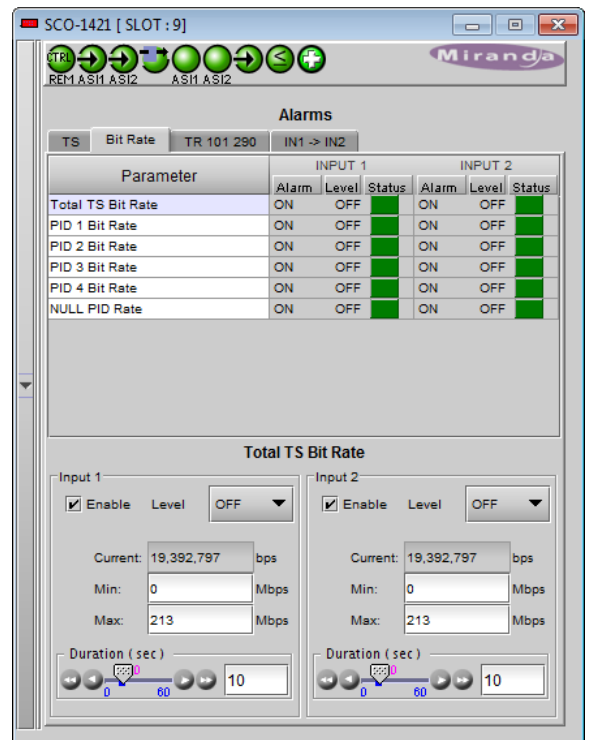


**Figure 3.14** *Total TS Bit Rate alarm*

### Bit Rate – PID n Bit Rate

*(Only available when the Advanced Probing option is enabled)*

This error is generated if the bit rate for a specific PID in the input transport stream is continuously outside a specified range of values for a period greater than the duration set in the data box.

- Up to 4 PIDs can be probed on each input, labeled PID 1, 2, 3, and 4 in this panel. The user specifies the actual PID in the data box at the bottom of the panel.

- Only the PIDs of the services selected for probing in the Alarm-TS panel are available for PID-bitrate probing here; other PIDs in the service cannot be seen.

- If the probing of a service is de-selected in the Alarm-TS panel, but PIDs from that service are still selected here, erroneous MIN Bitrate results will be displayed

The **Current** bitrate value is detected by the on-board probing of the SCO-1421 and displayed in the Current data box.

The **Min** and **Max** bitrate values are determined by the user, and entered into the data boxes by clicking and typing.

The **Duration** is determined by the user:

- The duration value may be entered by clicking and typing in the data box

- The duration data may be changed using the slider and control buttons on either end of it.

- Duration range is 0 to 60 seconds

Enable the error using the checkbox, and set the level to 1, 2 or OFF.

### Bit Rate – NULL PID Rate

This error is generated if the bit rate for the NULL PIDs (8191) in the input transport stream is continuously outside a specified range of values for a period greater than the duration set in the data box.

The **Current** bitrate value is detected by the on-board probing of the SCO-1421 and displayed in the Current data box.

The **Min** and **Max** bitrate values are determined by the user, and entered into the data boxes by clicking and typing.

The **Duration** is determined by the user:

- The duration value may be entered by clicking and typing in the data box

- The duration data may be changed using the slider and control buttons on either end of it

- Duration range is 0 to 60 seconds

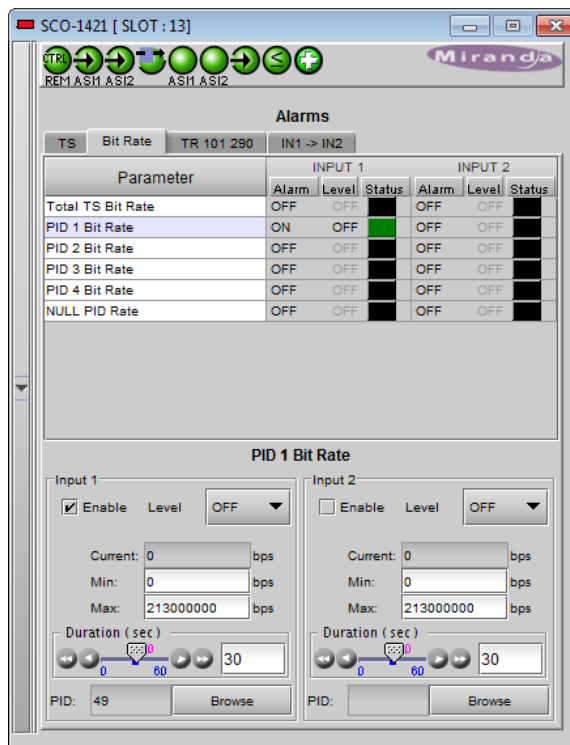This error is Enabled using the checkbox, and the level set to 1, 2 or OFF.
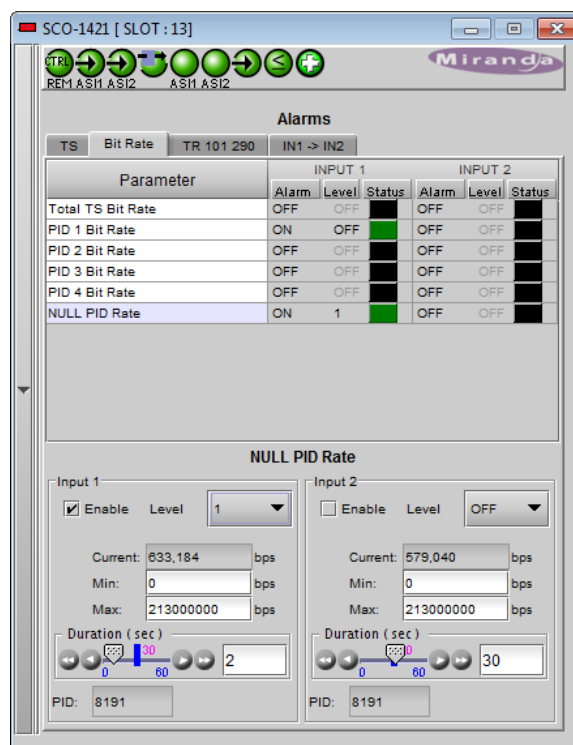


**Figure 3.15** *PID n Bit Rate*



**Figure 3.16** *NULL PID Rate*

### TR 101 290 – 1.1 TS_sync_loss

This alarm is set if the transport stream synchronization is lost.

This is the same as the Transport Stream Presence error in the TS tab, and the Level is fixed to the value set there. It is shown here because it is included in the TR 101 290 set. Use the Enable checkbox to display the results of the test in this panel.

*Note: When the Advanced Probing option is NOT enabled, some of these parameters are not measured, and they are grayed out in this display. These are noted individually in the discussions below.*
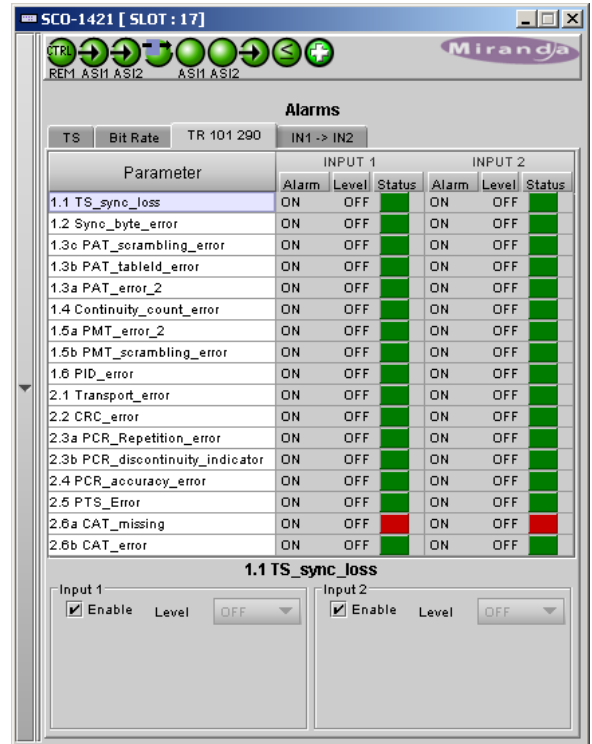


**Figure 3.17** *1.1 TS_sync_loss*

### TR 101 290 – 1.2 Sync_byte_error

This alarm is set if the detected sync byte is not equal to 0x47.

The error will only be flagged if the error rate exceeds the tolerance set using the slider, over the range 0 to 100 errors/sec.

This error is Enabled using the checkbox, and the level set to 1, 2 or OFF using the pulldown.
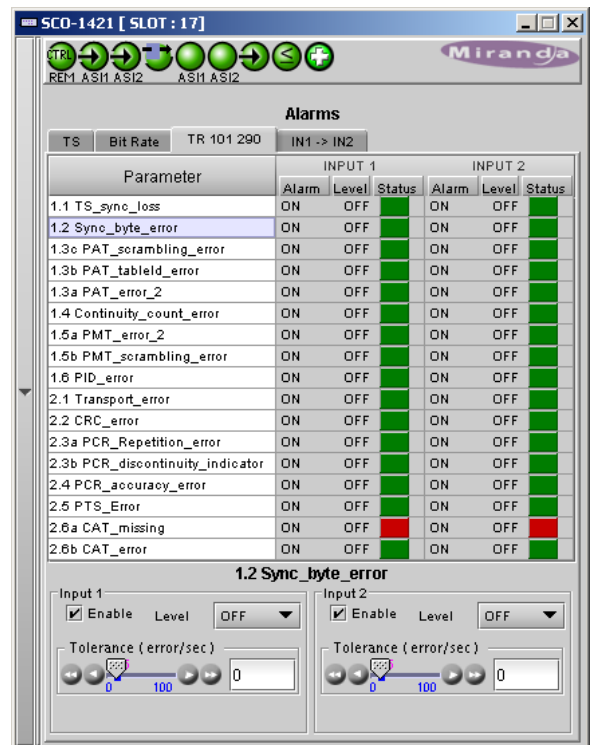


**Figure 3.18** *1.2 Sync_byte_error*

### TR 101 290 – 1.3c PAT_scrambling_error

*(Only available when the Advanced Probing option is enabled)*

An error occurs if the scrambling_control_field is not 00 for the PAT PID ( 0x0000).  An error is reported at the first scrambling error and the error will remain for few seconds…  (2-3 sec.).

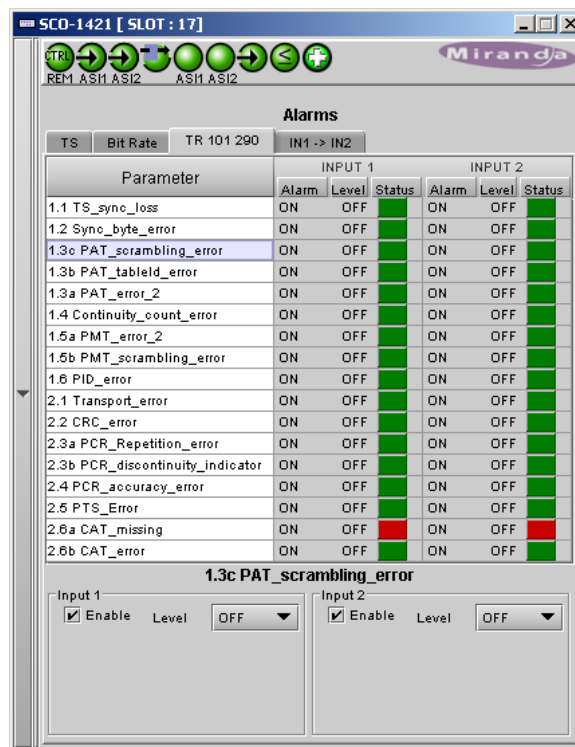This error is Enabled using the checkbox, and the level set to 1, 2 or OFF using the pulldown.



**Figure 3.19** *1.3c PAT_scrambling_error*

### TR 101 290 – 1.3b PAT_tableId_error

*(Only available when the Advanced Probing option is enabled)*

An error occurs if a PID 0x0000 does not contain a table_id = 0x00 (i.e. a PAT).  The error will be reported at the first wrong table_type and will remain for 2-3 sec.

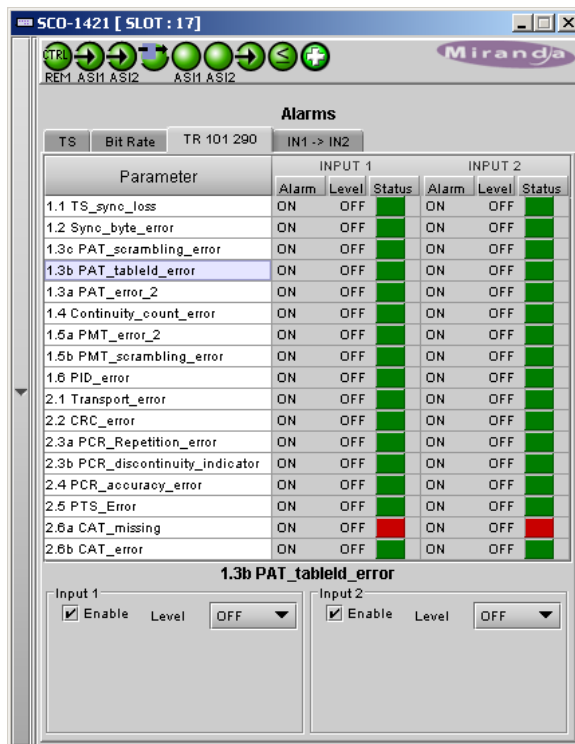This error is Enabled using the checkbox, and the level set to 1, 2 or OFF using the pulldown.



**Figure 3.20** *1.3b PAT_tableId_error*

### TR 101 290 – 1.3a PAT_error_2

*(Only available when the Advanced Probing option is enabled)*

An error occurs if the PAT PID (0x0000) does not occur for at least the time specified by Repetition Rate slider. The error will remain for few seconds after the PAT returns.

This error is Enabled using the checkbox, and the level set to 1, 2 or OFF using the pulldown.
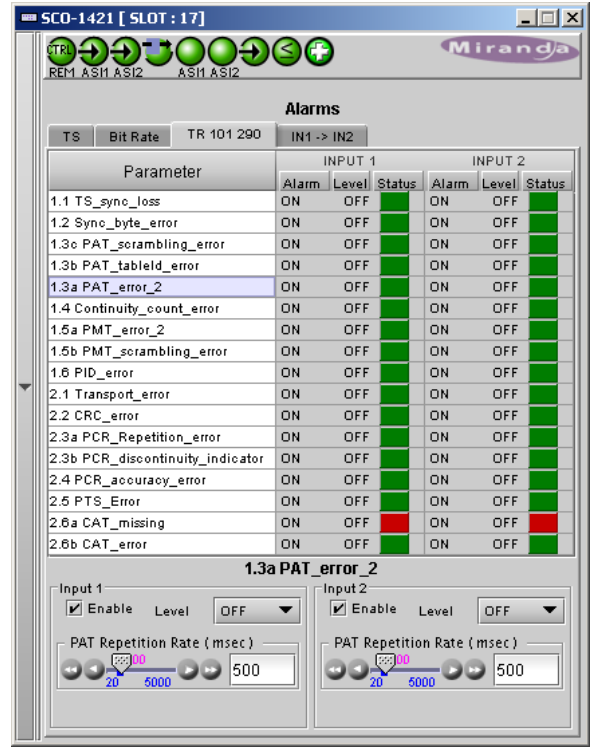


**Figure 3.21** *1.3a PAT_error_2*

### TR 101 290 – 1.4 Continuity_count_error

This parameter combines three separate checks – incorrect packet order; lost packet; and multiple packet occurrences.

- Note that only PIDs that are part of the services selected for probing will be verified. Other PIDs in the stream will not be checked.

An error will only be flagged if the error rate exceeds the tolerance set using the slider, over the range 0 to 100 errors/sec.

This error is Enabled using the checkbox, and the level set to 1, 2 or OFF using the pulldown.
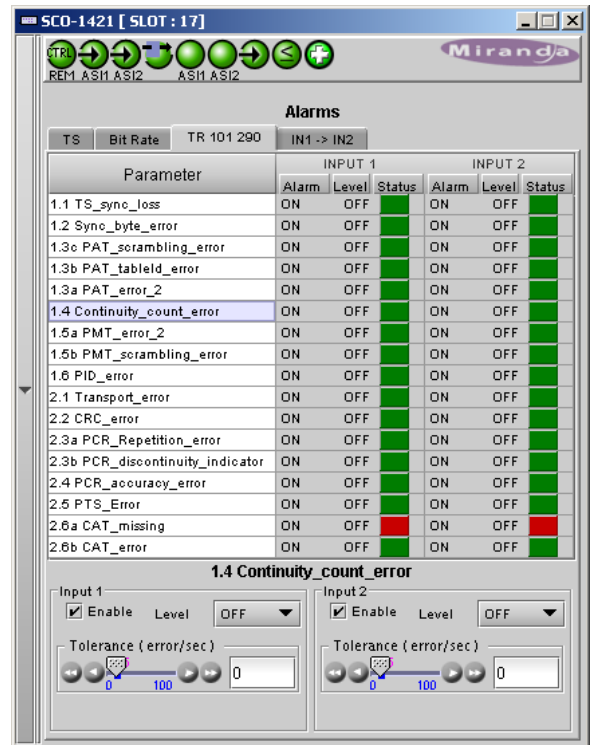


**Figure 3.22** *1.4 Continuity_count_error*

### TR 101 290 – 1.5a PMT_error_2

*(Only available when the Advanced Probing option is enabled)*

This error occurs if a PMT that is part of a service selected for probing (see TS tab…) is not present for the time specified by the Repetition Rate slider.

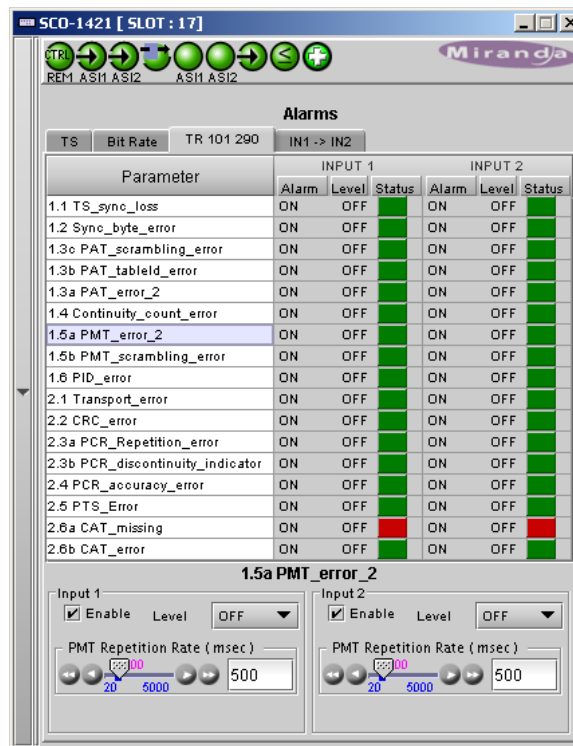This error is Enabled using the checkbox, and the level set to 1, 2 or OFF using the pulldown.



**Figure 3.23** *1.5a PMT_error_2*

### TR 101 290 – 1.5b PMT_scrambling_error

*(Only available when the Advanced Probing option is enabled)*

An error occurs if the scrambling_control_field is not equal to 00 for all PIDs containing sections with table_id 0x02 (i.e. a PMT).  Applies only to services selected for probing.

This error is Enabled using the checkbox, and the level set to 1, 2 or OFF using the pulldown.
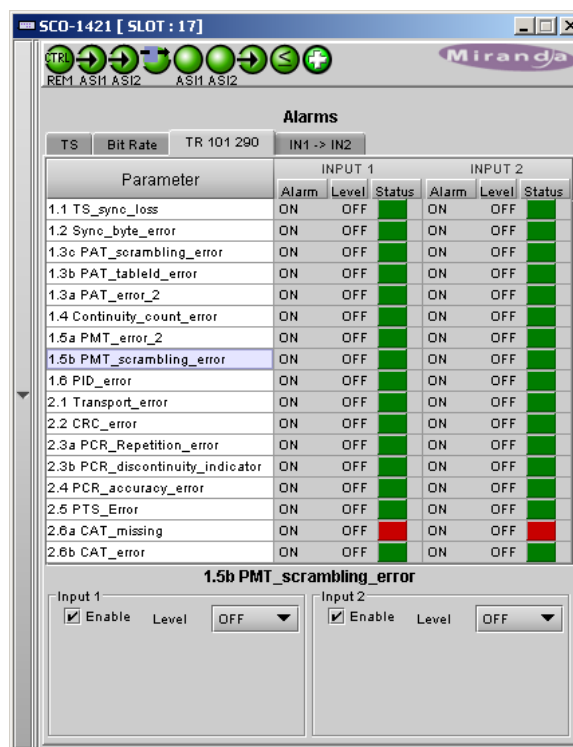


**Figure 3.24** *1.5b PMT_scrambling_error*

### TR 101 290 – 1.6 PID_error

*(Only available when the Advanced Probing option is enabled)*

This error occurs when there are PIDs with no associated datastream

This is the same as the Service Presence error in the TS tab, and the Level is fixed to the value set there. It is shown here because it is included in the TR 101 290 set. Use the Enable checkbox to display the results of the test in this panel. Enabling the error here will update the status reporting and error counting
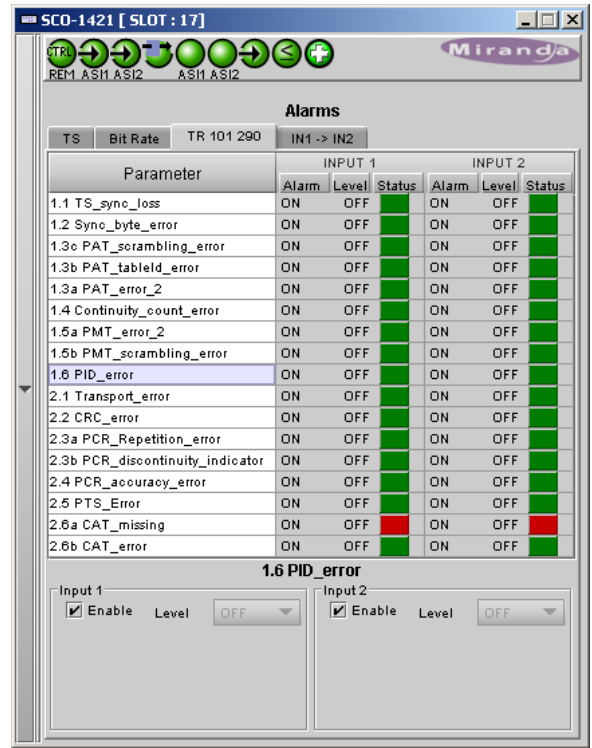


**Figure 3.25** *1.6 PID_error*

### TR 101 290 – 2.1 Transport_error

This parameter indicates that the transport error indicator in the TS header is set to "1"

An error will only be flagged if the error rate exceeds the tolerance set using the slider, over the range 0 to 100 errors/sec.

This error is Enabled using the checkbox, and the level set to 1, 2 or OFF using the pulldown.
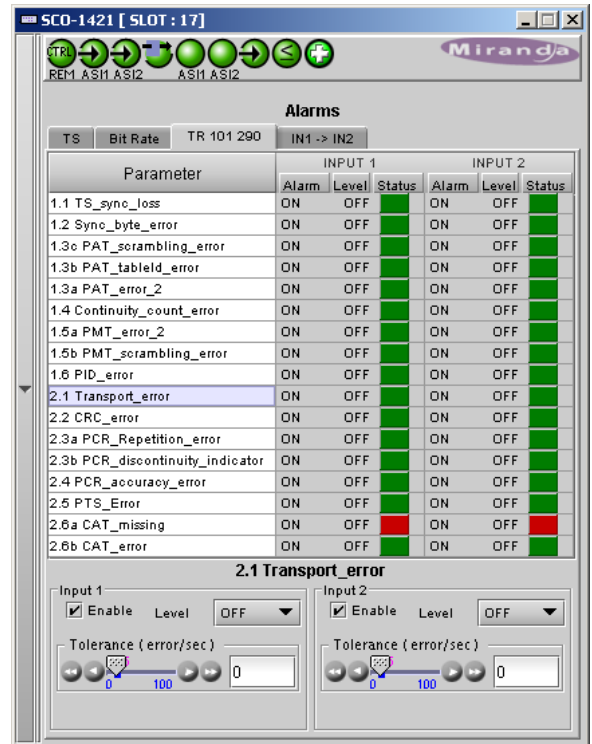


**Figure 3.26** *2.1 Transport_error*

### TR 101 290 – 2.2 CRC_error

*(Only available when the Advanced Probing option is enabled)*

The CRC check for the CAT, PAT, PMT, NIT, EIT, SDT and TOT indicates whether the content of the corresponding table is corrupted. In this case no further error indication should be derived from the content of the corresponding table.

* Only PMTs belonging to probed services are checked.

An error will only be flagged if the error rate exceeds the tolerance set using the slider, over the range 0 to 100 errors/sec.

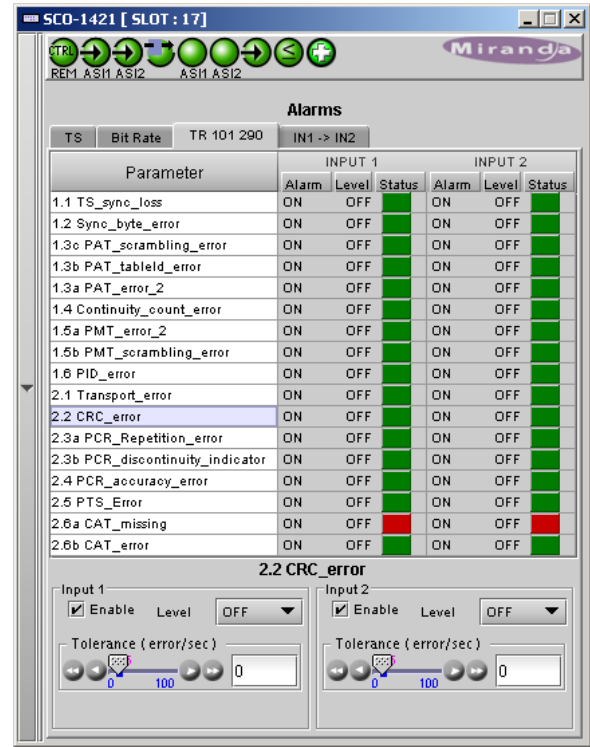This error is Enabled using the checkbox, and the level set to 1, 2 or OFF using the pulldown.



**Figure 3.27** *2.2 CRC_error*

### TR 101 290 – 2.3a PCR_Repetition_error

*(Only available when the Advanced Probing option is enabled)*

The PCRs are used to re-generate the local 27 MHz system clock. If the PCR do not arrive with sufficient regularity then this clock may jitter or drift. The receiver/decoder may even go out of lock. In DVB a repetition period of not more than 40 ms is recommended.

An error will only be flagged if the repetition rate exceeds the tolerance set using the slider, over the range 20 to 5000 msec.

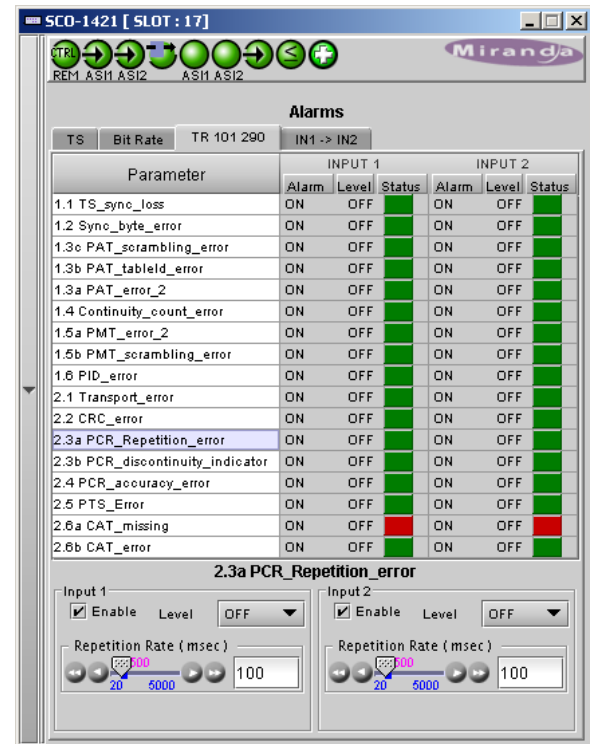This error is Enabled using the checkbox, and the level set to 1, 2 or OFF using the pulldown.



**Figure 3.28** *2.3a PCR_Repetition_error*

### *TR 101 290 – 2.3b PCR_discontinuity_indicator*

*(Only available when the Advanced Probing option is enabled)*

The PCR_discontinuity_indicator_error is set in the case that a discontinuity of the PCR values occurs that has not been signaled appropriately by the discontinuity indicator.

An error will only be flagged if the error rate exceeds the tolerance set using the slider, over the range 0 to 10 errors/sec.

This error is Enabled using the checkbox, and the level set to 1, 2 or OFF using the pulldown.
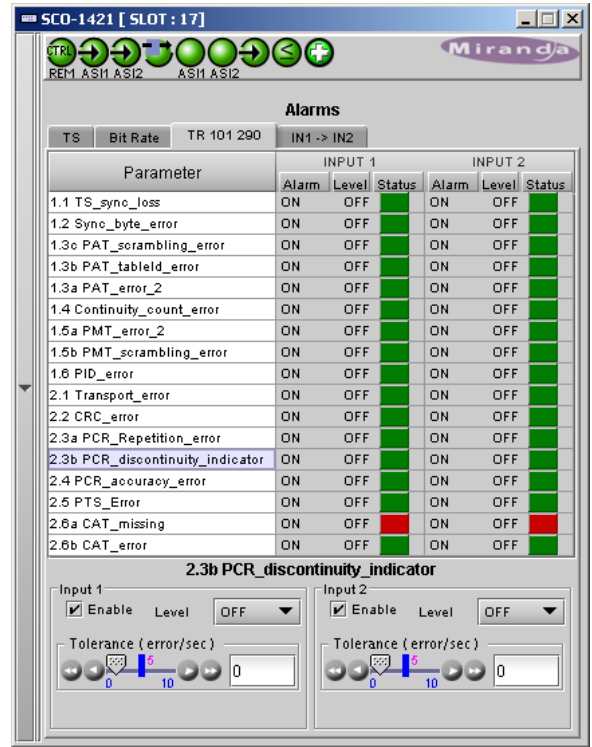


**Figure 3.29** *2.3b PCR_discontinuity_indicator*

### *TR 101 290 – 2.4 PCR_accuracy_error*

*(Only available when the Advanced Probing option is enabled)*

The accuracy of ±500 ns is intended to be sufficient for the color subcarrier to be synthesized from system clock.

This test should only be performed on a constant bitrate TS as defined in ISO/IEC 13818-1 [1] clause 2.1.7.

Further information on PCR jitter measurements is given in clause 5.3.2. and annex I of that document.

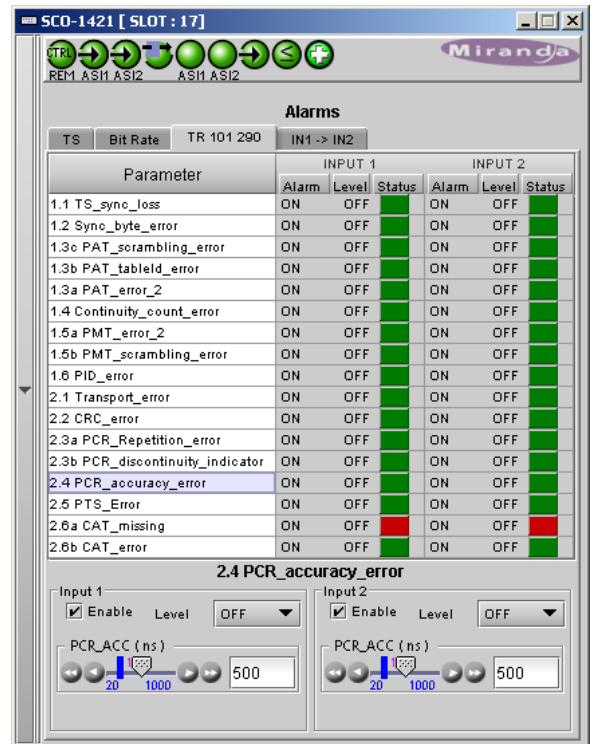This error is Enabled using the checkbox, and the level set to 1, 2 or OFF using the pulldown.



**Figure 3.30** *2.4 PCR_accuracy_error*

### TR 101 290 – 2.5 PTS_Error

*(Only available when the Advanced Probing option is enabled)*

The Presentation Time Stamps (PTS) should occur at least every 700 ms. They are only accessible if the TS is not scrambled.

An error will only be flagged if the timeout period of the PTS exceeds the tolerance set using the slider, over the range 20 to 5000 msec.

This error is Enabled using the checkbox, and the level set to 1, 2 or OFF using the pulldown.
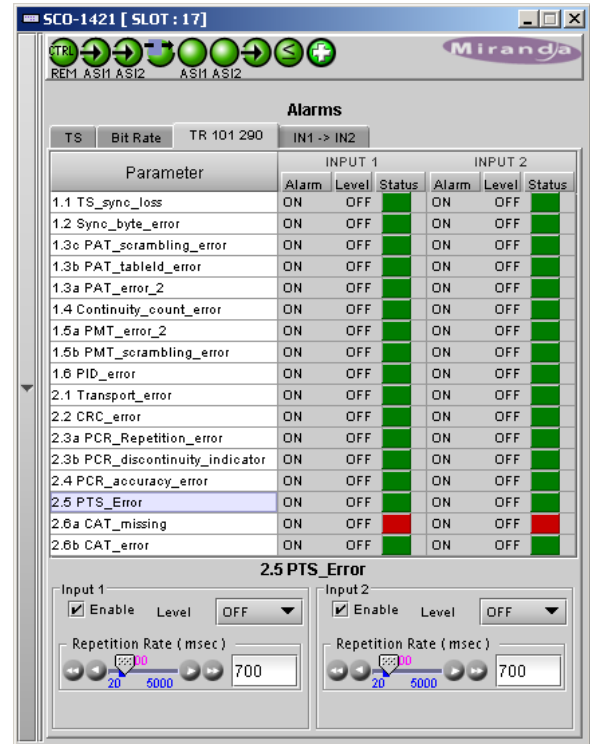


**Figure 3.31** *2.5 PTS_Error*

### TR 101 290 – 2.6a CAT_missing

*(Only available when the Advanced Probing option is enabled)*

The CAT is the pointer to enable the IRD to find the EMMs associated with the CA system(s) that it uses. If the CAT is not present while there's at least one scrambled service present for the time specified by the Repetition Rate slider, an error will be reported. The error counter will increment every time NO CAT table is recognized for the repetition time specified by the slider.
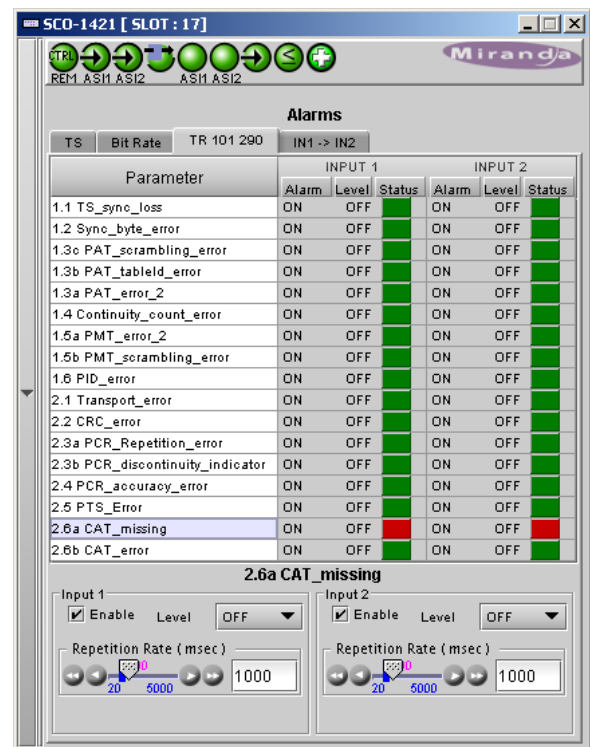


**Figure 3.32** *2.6a CAT_missing*

### TR 101 290 – 2.6b CAT_error

*(Only available when the Advanced Probing option is enabled)*

This alarm is triggered when a section with table_id other than 0x01 (i.e. not a CAT) is found on PID 0x0001, which is reserved for CAT tables. The LED turns RED each time this condition is encountered and remains RED for few seconds.

This error is Enabled using the checkbox, and the level set to 1, 2 or OFF using the pulldown.
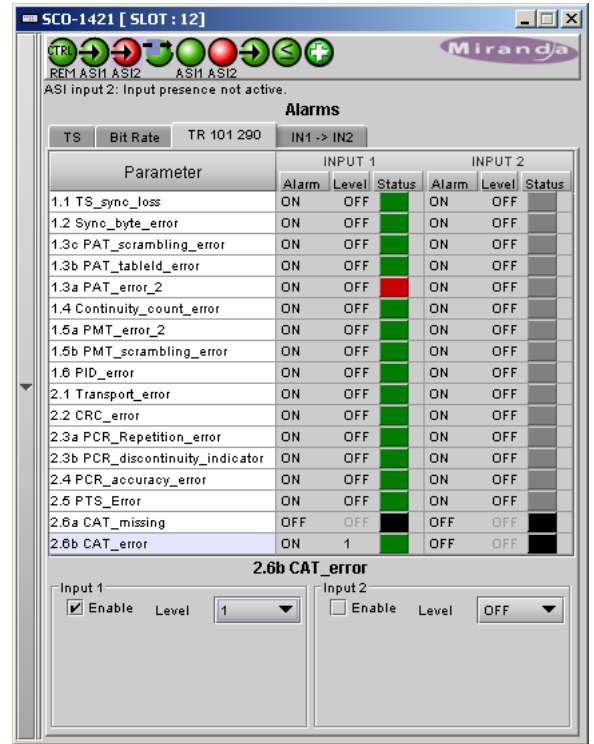


**Figure 3.33** *2.6b CAT_error*

### In1->In2

Click the checkbox to force all alarm parameters for input 2 to match those set for input 1.

- When this is selected, only one set of alarm parameters is displayed for both inputs.

- When the checkbox is deselected, the alarm parameters for input 2 revert to their previous values, i.e. as they were before the checkbox was selected.

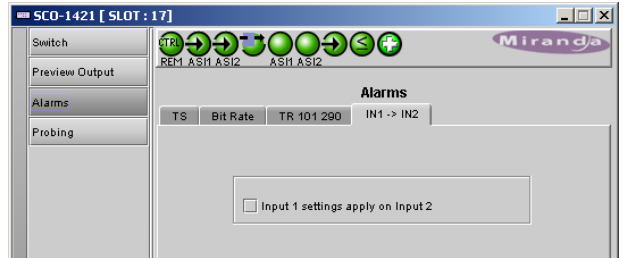- When the checkbox is clicked, a confirmation dialog appears.



**Figure 3.34** *IN1 ➝ IN2 alarm configuration*

### 3.5.5   The *Probing* panel

#### 3.5.5.1   TS tab

In this panel, view the status of the transport stream on each of the two inputs, and a list of all 12 services available to probe on each input.

*Input Status:* The status of the transport stream on each input is indicated by these parameters:

- TS Presence:        Status icon - Green if a valid service TS is present at the input
- TS Packet Size:     equal to 188 or 204 bytes, depending on the transport stream
- TS Total Bit Rate:  in Mbps
- System Type:        ATSC, DVB, ISO13818-1
- Transport_ID:       Any ID value from 0x0000 to 0xFFFF

*Probed Services:*  Shows a list of all 12 services that have been probed from among the many that may be available in the transport stream



***Figure 3.35*** *Probing – TS panel*

#### 3.5.5.2   Tables tab

Sub-tabs give access to tree diagrams of the transport stream for each input

Click on the + and – boxes to expand or contract the display, in order to view the information of interest.
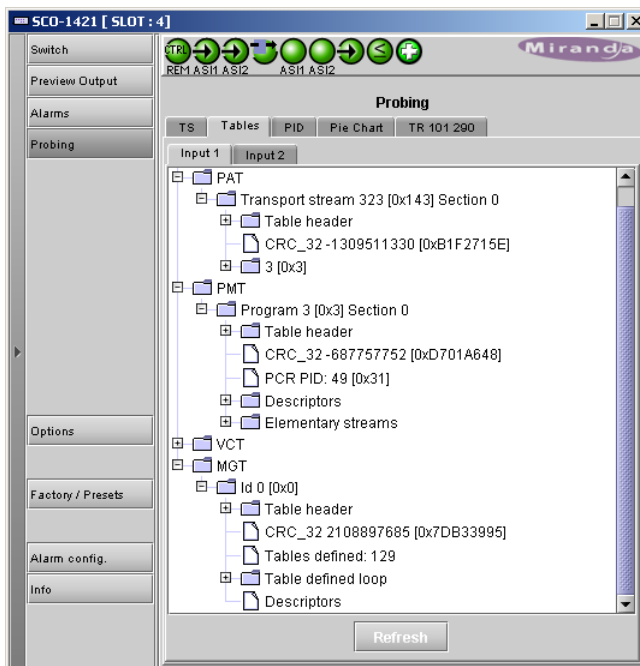


***Figure 3.36*** *Probing - Tables panel*

### 3.5.5.3  PID tab

The panel displays a list of all PIDs in the services selected for probing within the transport stream. A status icon is shown for the service itself, to the right of the service name, and an icon is shown for each PID.
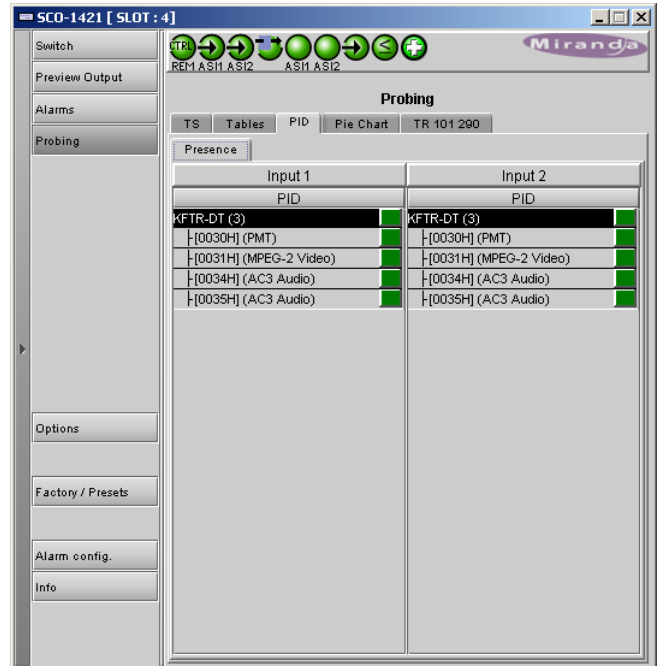
- Green if present, red if absent



**Figure 3.37** *Probing – PID panel*

### 3.5.5.4  Pie Chart tab

*(Only available when the Advanced Probing option is enabled)*

This tab displays the incoming service in the form of a pie chart, with color-coded segments representing the various elements in the service.

- This representation illustrates the bandwidth distribution within the probed services.
- The bitrate of other, non-probed PIDs, as well as the total bitrate, is shown at the bottom of the panel.

The table below the chart shows all of the elements, identifying each by name, PID and bandwidth.

Click on a name in the table, and the corresponding slice of the pie will slide out from the chart

Mouse-over a slice and the associated Program Name will pop up.
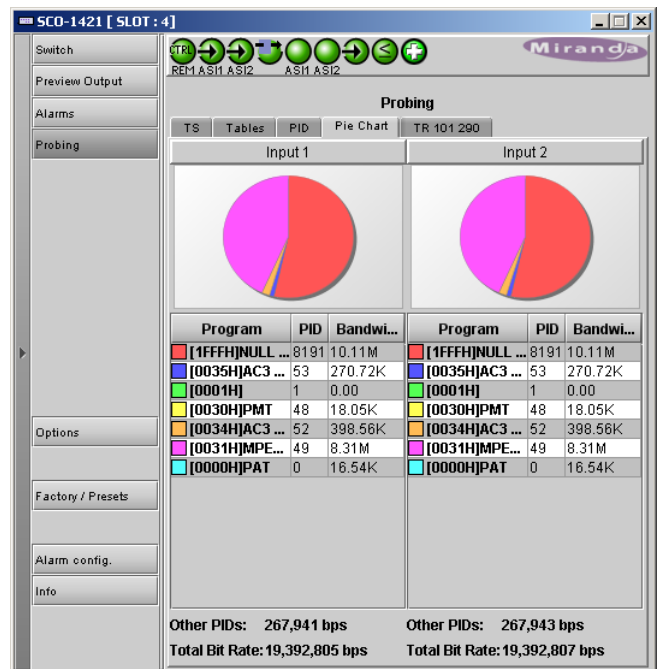


**3.38** *Probing - Pie Chart panel*

### 3.5.5.5  TR 101 290 tab

This tab shows the current status of each of the tests against the TR 101 290 standard (green or red status indicator, plus error message), plus the number of errors that have occurred since the counter was last reset.

Use the tabs to view the results for inputs 1 and 2.

Click the Reset button to reset the counters to zero and clear the error messages.

*Note: When the Advanced Probing option is NOT enabled, some of these parameters are not measured, and they are grayed out in this display.*
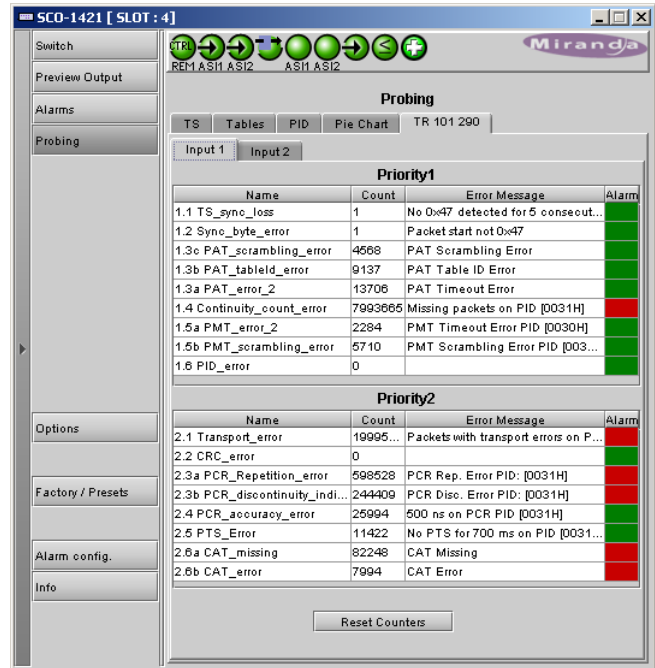


**3.39** *Probing - TR 101 290 panel*

### 3.5.6  The *Options* panel

**Advanced Probing Option**

This option activates the advanced probing feature of the SCO-1421, to supplement the standard transport stream probing included with the card.

To activate this option, you must
- Obtain a license key from Miranda Technologies Inc.
- Type the license key in the *Enter Key* box
- Click on ENABLE OPTION to enable the option's features.

The information window beneath the key entry box indicates whether the option is activated (green) or not (gray).



**Figure 3.40** *Options panel*

### 3.5.7 The *Factory / Presets* panel

The SCO-1421 maintains "Factory Default" settings in its memory, to which it can be restored at any time.

Click the *Load Factory* button to restore the card to its Factory default settings.

**User Presets**

The SCO-1421 has memory registers which can hold up to 5 sets of user-defined parameter settings.

- IP parameters are *not* included in the saved data

Select any one of the five presets using the pulldown list. The name of the currently-selected User Preset is shown on the pulldown icon (e.g. *User1*, *User2*,… *User5*)

- Click *Load* to load the contents of the selected User Preset into the SCO-1421. All parameter settings and values will be replaced by the contents of the selected User Preset.

- Click *Save* to store the current parameter settings and values from the SCO-1421 into the selected User Preset. The existing contents of the preset will be overwritten.



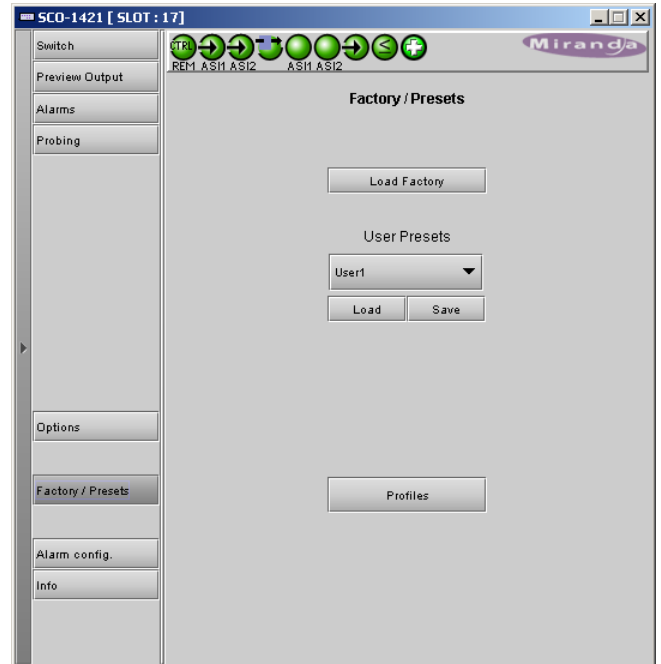**Figure 3.41** *Factory / Presets panel*

### 3.5.7.1 Profiles

This section provides the option to save and recover the entire card configuration (including user presets if desired) on an external disk, or to copy it to another SCO-1421 card.

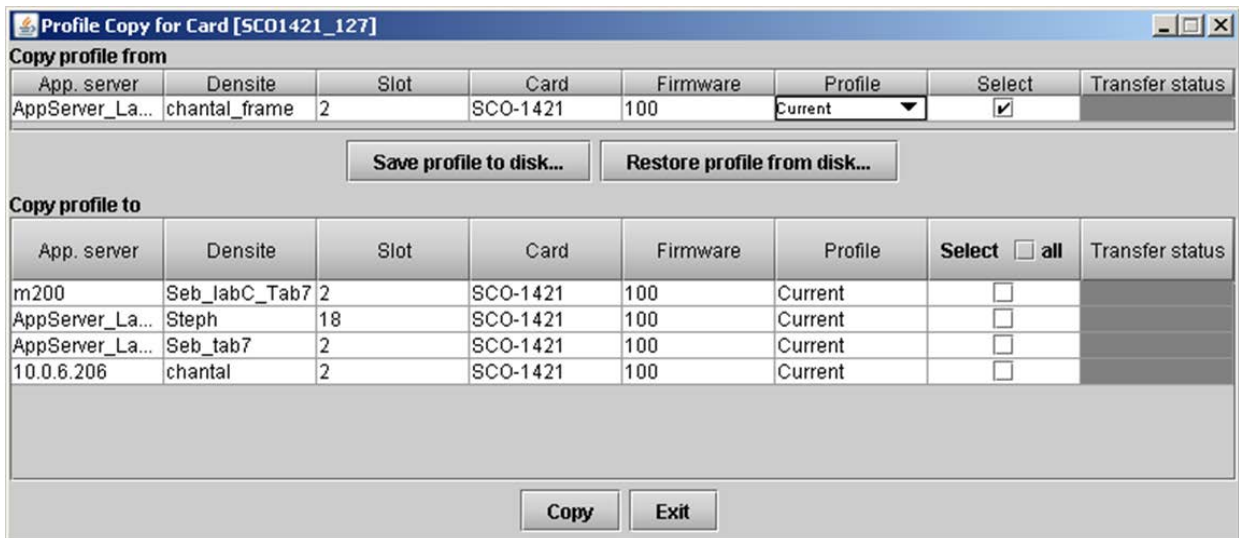Click on the *Profiles* button at the bottom left corner of the control panel to open the Profile Copy window.



**Figure 3.42** *Profile Copy window*

**Copy Profile From:**

This line shows this SCO-1421 card, and identifies it by App server, Densité frame and slot number, card type and firmware version.

The *Profile* column has a pulldown that allows you to select which profiles you will work with, and gives these choices:
- Current, User1, User2, User3, User4, User5

The *Select* column includes a checkbox, preselected as checked, to confirm that you want to work with the current card.
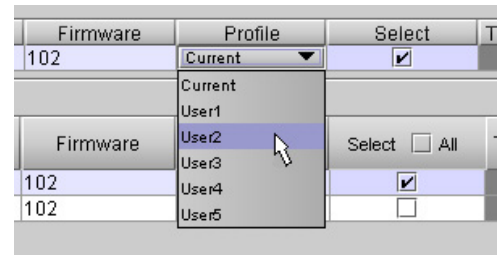


**Figure 3.43** *Select Profile to Copy*

**Save Profile to Disk…**
Click this button to open a Save dialog allowing you to specify a file name and location to which the selected profiles for this card will be saved.

*Hint - It is a good idea to create a folder for these files, because they are not explicitly identified as SCO-1421 profiles, and will be difficult to find and identify if not clearly named and conveniently located.*

- Click the save button once the name and location have been identified in the Save box

- If the file is saved correctly, the Transfer Status box on the right of the *Copy profile from* line will indicate *Succeeded* against a green background

- If the file was not saved for some reason, the Transfer Status box to the right of the *Copy profile from* line will indicate *Failed* against a red background
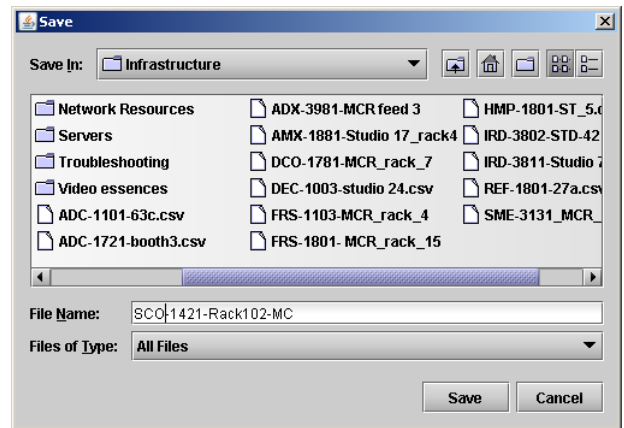


**Figure 3.44** *Save Profile to disk*

**Restore profile from disk…**
Click this button to open an *Open* dialog box within which you can locate and select a valid SCO-1421 profile file.

- Click Open to read the contents of the file and to reconfigure this SCO-1421's profiles according to its contents

- While the reconfiguration is in progress, the Transfer Status box on the right of the *Copy profile from* line will indicate *Working* against a yellow background

- When the reconfiguration is complete, the Transfer Status box on the right of the *Copy profile from* line will indicate *Succeeded* against a green background

**Note:** There is no need to select a profile using the Profile pulldown (e.g. current, User1, etc.) when restoring a profile from disk. The profile selection is stored within the file.



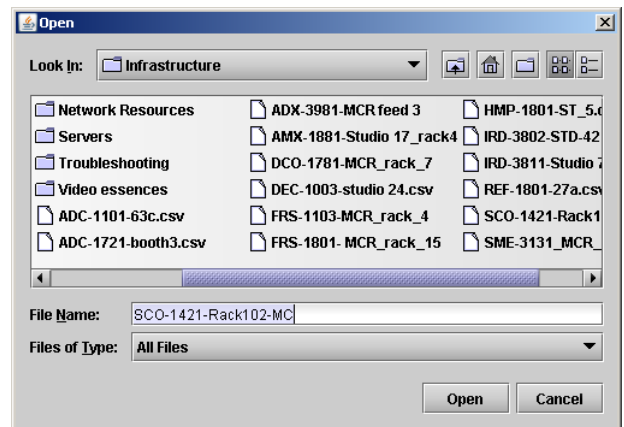**Figure 3.45** *Open a profile file to restore profiles*

**Copy profile to section**
This line shows other SCO-1421 cards that are available on the iControl network, each identified by App server, Densité frame and slot number, card type and firmware version.

The *Profile* column shows the same information as is shown for the current card in the Copy profile from line, i.e.
- Current, User1, User2, User3, User4, User5

The *Select* column includes a checkbox to identify which SCO-1421 cards you wish to copy profiles into from the current card.

- For convenience, a *Select all* checkbox is provided in the column header

Click *Copy* to copy the selected profiles from this card into the selected other SCO-1421 cards

- While the profile copy operation is in progress, the Transfer Status box on the right of the *Copy profile to* line will indicate *Working* against a yellow background
- When the profile copy operation is complete, the Transfer Status box on the right of the *Copy profile to* line will indicate *Succeeded* against a green background

## 3.5.8 The *Alarm Config* panel
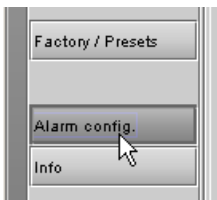
This panel allows the alarm reporting of the SCO-1421 to be configured. The panel opens in a new window when the button is clicked, and can be resized if needed.

The panel is organized in columns.

### Status/Name

This contains an expandable tree listing all the alarms reported by this SCO-1421 card.

- Each alarm name includes an icon that shows its current status

The **Card LED**, **Overall alarm** and **GSM contribution** columns contain pulldown lists that allow the level of contribution of each individual alarm to the alarm named in the column heading to be set.

- Click on the icon to reveal the associated pulldown list of levels

### Card LED

This column indicates the contribution of each individual alarm to the color indicated on the front-card-edge status LED.

### Overall Alarm

This column allows configuration of the contribution of each individual alarm to the Overall Alarm associated with this card. The Overall Alarm is shown in the upper left corner of the iControl panel, and also appears at the bottom of the Status/Name column.

### GSM Contribution

This column allows configuration of the contribution of each individual alarm to the GSM Alarm Status associated with this card. GSM is a dynamic register of all iControl system alarms, and is also an alarm provider for external applications. The possible values for this contribution are related to the Overall alarm contribution:
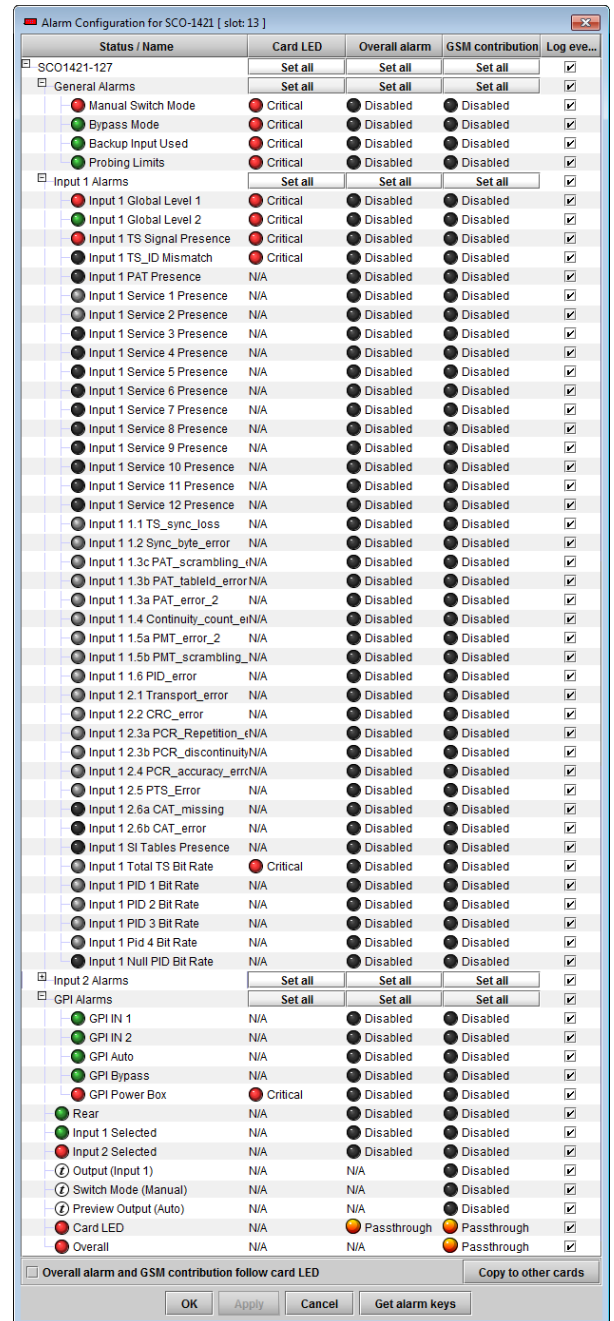
**Figure 3.46** Alarm Configuration Panel

- If the Overall alarm contribution is selected as Disabled, the GSM alarm contribution can be set to any available value
- If the Overall alarm contribution is selected as any level other than disabled, the GSM contribution is forced to follow the Overall Alarm.

---

***Levels associated with these alarms:***

The pulldown lists may contain some or all of the following options:

| | |
|---|---|
| ● Disabled ▼ | The alarm makes no contribution (black icon) |
| ● Minor ▼ | The alarm is of minor importance (yellow icon) |
| ● Major ▼ | The alarm is of major importance (orange icon) |
| ● Critical ▼ | The alarm is of critical importance (red icon) |
| ● Passthrough ▼ | The alarm exists but has no effect (used for text and composite alarms) |

***Shortcut:*** *if you click in one of the Set All boxes beside a section heading, you will open a pulldown that lets you assign a level to all alarms in that section of the column simultaneously.*

---

### Log Events
iControl maintains a log of alarm events associated with the card. The log is useful for troubleshooting and identifying event sequences. Click in the checkbox to enable logging of alarm events for each individual alarm.

At the bottom of the window are several other controls

### Overall alarm and GSM contribution follow card LED
Click in the checkbox to force the Overall alarm and GSM contribution to be identical to the Card LED status

- All Overall alarms and GSM contributions for which there is a Card LED alarm will be forced to match the Card LED alarm
- All Overall Alarms and GSM contributions for which there is no Card LED alarm will be forced to Disabled

A warning box will open allowing you to confirm the action, since it will result in changes to the configuration and there is no *undo* function.

**Warning**

Selecting this option will force the Overall Alarm and GSM Contribution values, in the Alarm Configuration window, to follow those in the Card LED column. Changes to the current settings will be visible when you click OK here, but do not take effect until you click OK or Apply in the Alarm Configuration window. To leave all settings unchanged, close the Alarm Configuration window, or click Cancel, and choose not to save changes.

Click OK to continue, or click Cancel to return to the Alarm Configuration window without selecting this option.

[ OK ]  [ Cancel ]

**Figure 3.47** *Warning for Follow LED change*

### Copy to other cards

Click this button to open a panel that allows the alarm configuration set for this card to be copied into another SCO-1421 card.

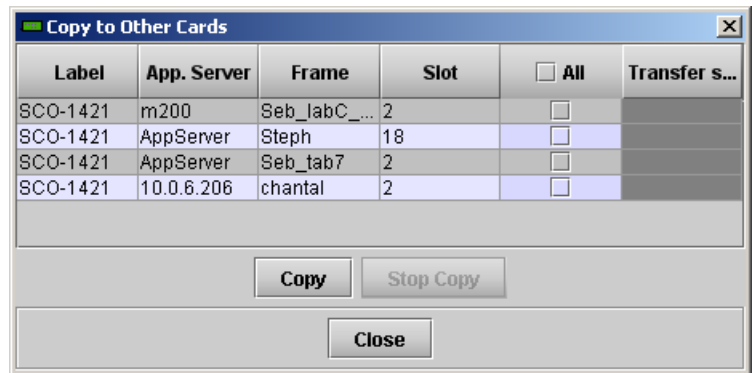- Select one or more destination cards from the list in the window by clicking in the checkboxes, or all of them by clicking in the *All* checkbox

- Note that when you do a Copy Profile for this card (see Sect. 3.5.7.1), the alarm configuration is copied along with all the other settings.



*Figure 3.48 Copy to other cards*

### Get alarm keys

Click this button to open a save dialog where you can save a file containing a list of all alarms on this card and their current values, along with an Alarm Key for each. The alarm keys are useful for system integration and troubleshooting.

- The file is saved in .csv format
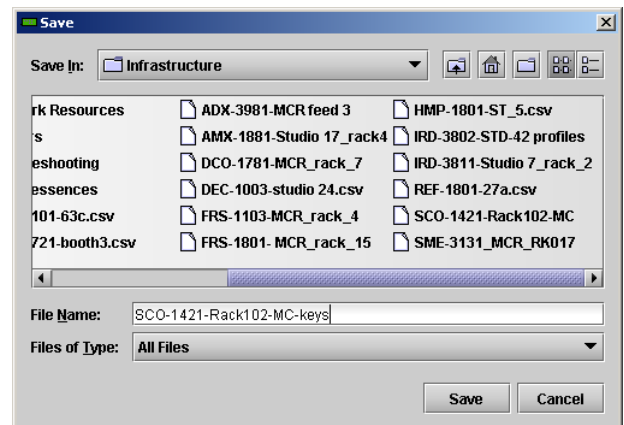


*Figure 3.49 Get Alarm Keys save dialog*

### OK, Apply, Cancel

- **OK** accepts the settings and closes the window once the card confirms that there are no errors.
- **Apply** accepts the settings, but leaves the window open
- **Cancel** closes the window without applying any changes, and leaves the previous settings intact.

### 3.5.9   The *Info* panel

When the SCO-1421 is included in an iControl environment, certain information about the card should be available to the iControl system. The user can enter labels and comments that will make this card easy to identify in a complex setup. This information is entered via the Info control panel. This panel also shows other information about the card.

Label:          type the label that appear for this SCO-1421 when it appears in iControl applications

Short Label    type the short-form label that iControl uses in some cases (8 characters)

Source ID      type a descriptive name for this SCO-1421

Comments:      type any desired text



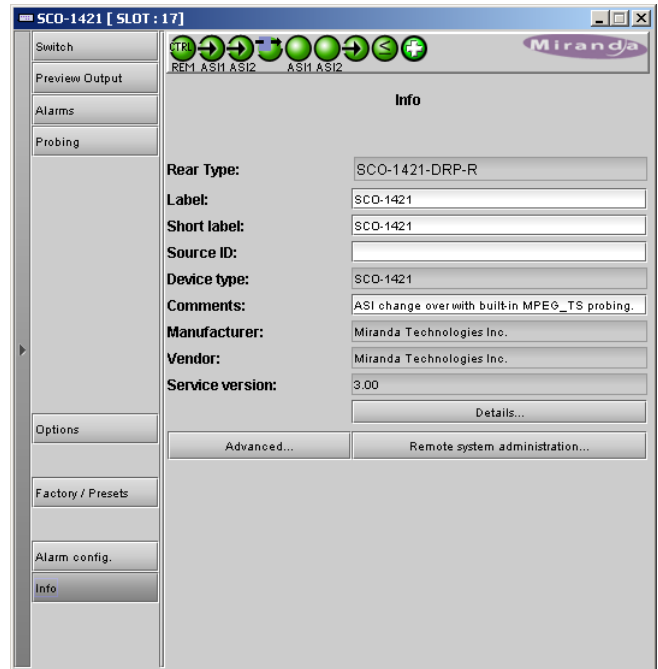***Figure 3.50*** *Info Panel*

The remaining data boxes show manufacturing information about this card.

- Details…: Reports the Firmware version, service version, and panel version for this card
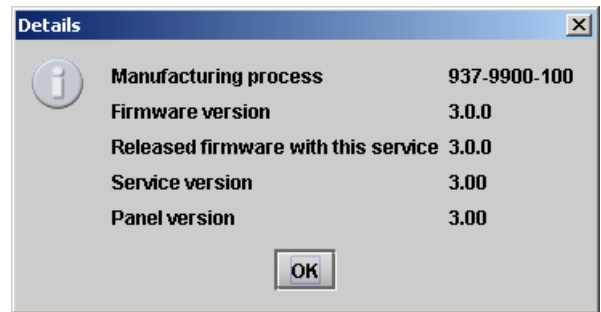


***Figure 3.51*** *Details window*

- Advanced…:  Shows the Miranda LongID for this card. The Miranda LongID is the address of this SCO-1421 in the iControl network.
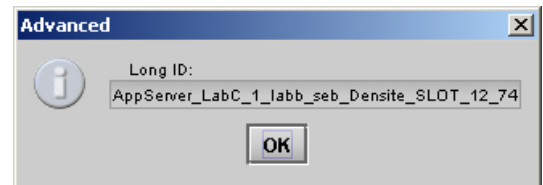


***Figure 3.52*** *Advanced window*

- Remote System Administration – opens the Joining Locators data box, which lists remote lookup services to which this SCO-1421 is registered.

  ***Add:*** Force the iControl service for this SCO-1421 to register itself on a user-specified Jini lookup service, using the following syntax:

  jini://<ip_address>

  where <ip_address> is the ip address of the server running the lookup service

  Enter the address in the Input data box. e.g.
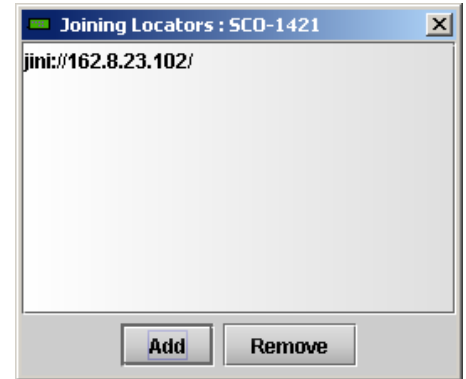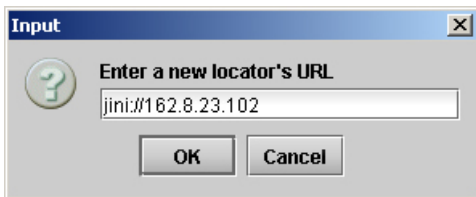


***Figure 3.53*** *Joining Locators window*



***Remove:*** select one of the services listed in the window by clicking on it, and click *Remove* to delete it from the window. A Query window will open asking you to confirm the action.
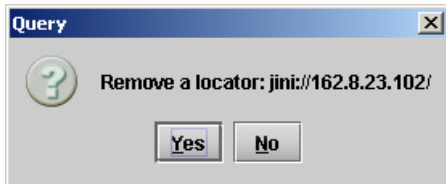
# 4   Specifications

**ASI INPUTS (2)**

| | |
|---|---|
| SIGNAL | EN50083-9 (V2:3/98) DVB ASI |
| DATA BIT RATE | 213 Mbps |
| CABLE LENGTH | 300 m (985') Belden 1694A at 270Mbps |
| TS PACKET LENGTH | 188/204 byte packets |
| RETURN LOSS | > 15dB up to 270Mbps |
| CONNECTORS | BNC |

**ASI OUTPUTS (2)**

| | |
|---|---|
| SIGNAL | Program and Preview outputs<br>EN50083-9 (V2:3/98) DVB ASI |
| RETURN LOSS | > 15dB up to 270Mbps |
| JITTER | < 0.2 UI (0.74ns) pp |
| CONNECTORS | BNC |

**GPI**

| | |
|---|---|
| GPI IN (4) | Opto-isolated, contact closure to GND |
| GPI OUT (4) | 75mA max, 28V max |

**ELECTRICAL**

| | |
|---|---|
| POWER | 8W |

# ANNEX – SCO-1421 User Interface

| | | | |
|---|---|---|---|
| **STATUS** | **GENERAL STATUS** | REAR TYPE<br>HARDWARE FAILURE<br>BYPASS ENABLED<br>BACKUP USED<br>MANUAL MODE ON<br>ATSC / ASI / ISO13818-1 | |
| | **INPUT1 STATUS** | TS PRESENT / NO INPUT<br># of bytes in TS (188/204)<br>Total bit rate VALUE<br>Transport ID VALUE<br>Error messages from alarms (see ALARM CONFIG below) | |
| | **INPUT2 STATUS** | Same as for input 1 | |

| | | |
|---|---|---|
| **USER PRESETS** | **LOAD** | [USER 1 ….USER 5] |
| | **SAVE** | [USER 1 ….USER 5] |

**PREVIEW OUTPUT**     [AUTO / INPUT 1 / INPUT 2 / FOLLOW PROGRAM]

**OPERATING MODE**     [<u>AUTO</u> / MANUAL / BYPASS]

**INPUT SELECT**     [N/A / <u>IN1</u> / IN2 /]

**AUTO SWITCH MODE**     [<u>SWITCH TO</u> / SWITCH AND RETURN / TOGGLE]

**VERSION**     XXX

**FACTORY DEFAULT**     [RESTORE]     Sets all parameters shown above to their <u>underlined</u> default values.

| | | | |
|---|---|---|---|
| **ALARM CONFIG** | **TS Presence Input 1** | **LED COLOR** | [GREEN / YELLOW / <u>RED</u> / FLASH RED] |
| | | **GPI REPORTING** | [<u>OFF</u> / ON] |

TS Presence Input 2
Total Bit Rate error for Input 1
Total Bit Rate error for Input 2
Transport ID Mismatch for input 1
Transport ID Mismatch for input 2
Bypass Enabled
Backup Used             Same as the TS Presence Input 1 error
Manual Mode Enabled
Global Level 1 for Input 1
Global Level 2 for Input 1
Global Level 1 for Input 2
Global Level 2 for Input 2
Limitation Alarm
GPI Power Alarm