IQMDDM-T 2-Input ASI Distribution Amplifier & Transport Stream Monitor with Template Matching IQMDDM without Template Matching

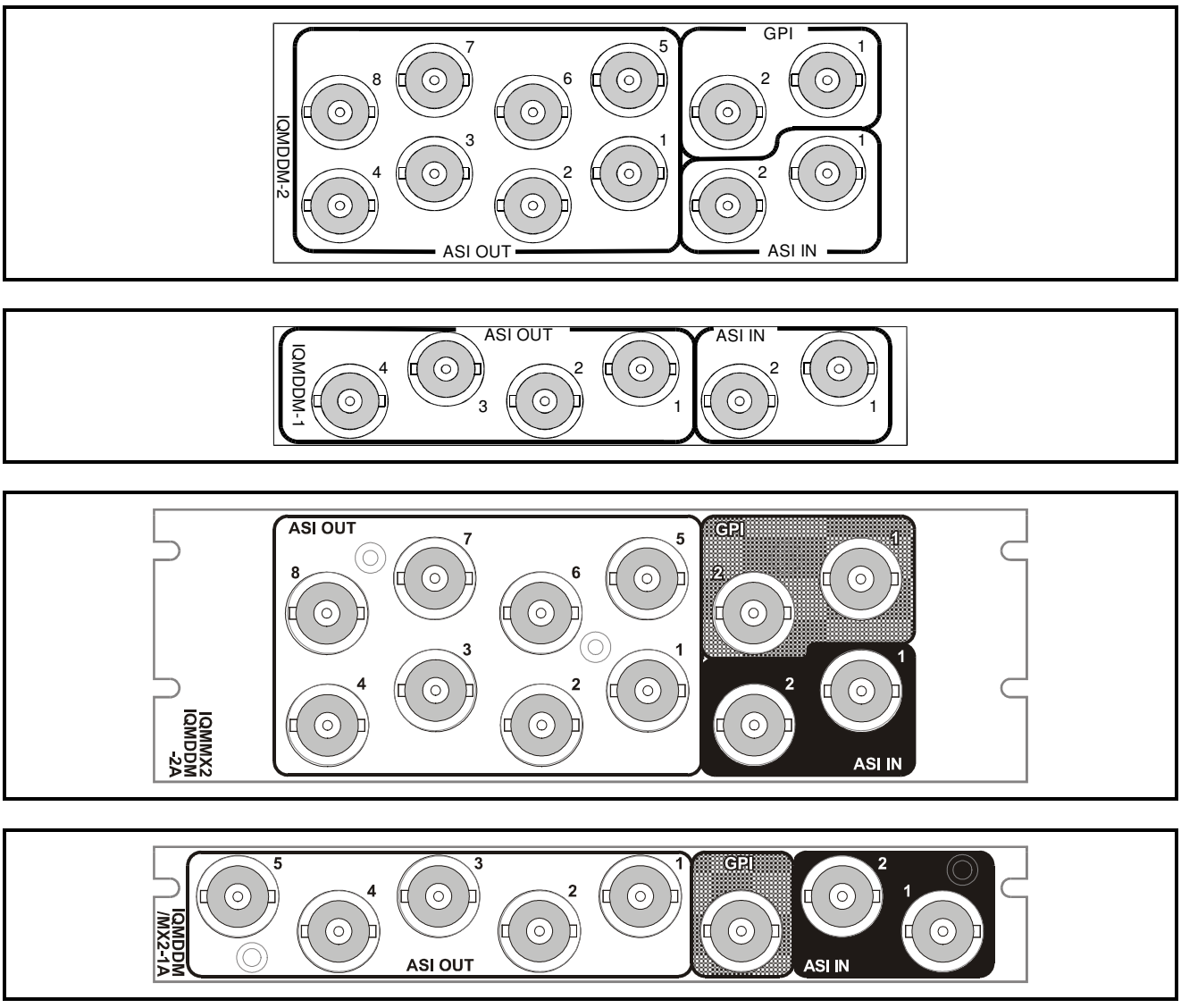
Table of Contents

Module Description

The IQMDDM-T is an ASI 2 to 1 switch, distribution amplifier and transport stream monitor and Template Matching with up to 8 outputs in double width or 4 outputs in single width. The inputs are transformer coupled and equalized to > 200 m of high quality cable. The IQMDDM version does not have the Template Matching function. All outputs are re-clocked and transformer coupled. There is independent control of the input to be passed to the distribution amplifier outputs and the input to be passed to the transport stream monitor. The module monitors the legality of the MPEG2 transport stream to ETR 290 Priority 1. In addition, some priority 2 and 3 parameters are also checked.
On the double width modules two GPI ports are available which may be configured to any control or reporting parameter.

All control and monitored parameters are available for access over the RollCall remote control network. The RollCall logging utility enables selected events to be logged on a remote server(s).

Rear Panel View



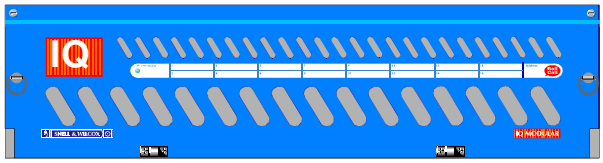
Versions of the module cards available are:

IQMDDM-1	2 Input ASI distribution amplifier 4 outputs	Single width module
IQMDDM-2	2 Input ASI distribution amplifier 8 outputs	Double width module
IQMDDM-1-TM	2 Input ASI distribution amplifier 4 outputs with Template Matching	Single width module
IQMDDM-2-TM	2 Input ASI distribution amplifier 8 outputs with Template Matching	Double width module
IQMDDM-1A	2 Input ASI distribution amplifier 5 outputs	Single width module
IQMDDM-2A	2 Input ASI distribution amplifier 8 outputs	Double width module
IQMDDM-1A-TM	2 Input ASI distribution amplifier 5 outputs with Template Matching	Single width module
IQMDDM-2A-TM	2 Input ASI distribution amplifier 8 outputs with Template Matching	Double width module

Note that there are two styles of rear panels available. They are not interchangeable between the two styles of enclosures. However, the cards may be fitted into any style of enclosure.

'A' Style Enclosure

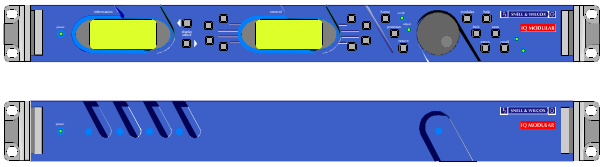
Rear panels ***with*** the suffix A may only be fitted into the 'A' style enclosure shown below.



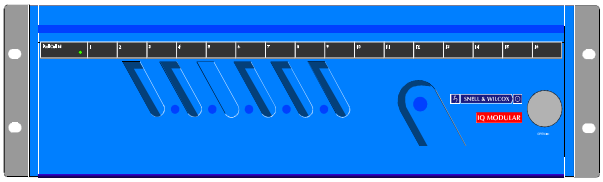
(Enclosure order codes IQH3A-E-0, IQH3A-E-P, IQH3A-0-0, IQH3A-0-P)

'O' Style Enclosures

Rear panels ***without*** the suffix A may only be fitted into the '0' style enclosures shown below.



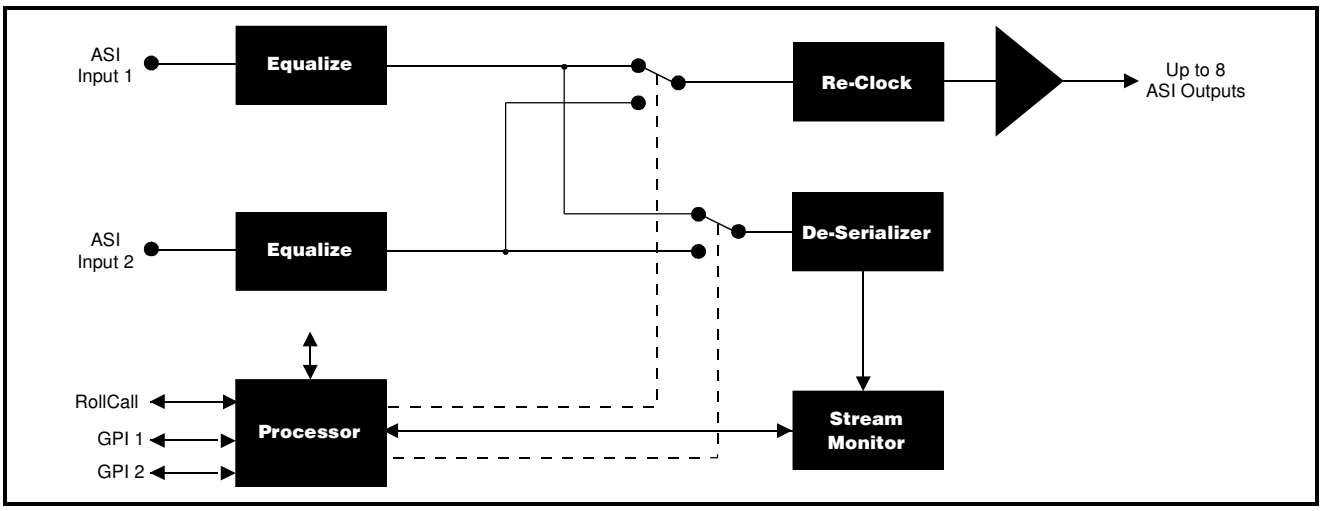
(Enclosure order codes IQH1S-RC-0, IQH1S-RC-AP, IQH1U-RC-0, IQH1U-RC-AP, Kudos Plus Products)



(Enclosure order codes IQH3N-0, IQH3N-P)

(Enclosure order codes IQH3U-RC-0, IQH3U-RC-P)

Block Diagram



IQMDDM-T Features

ASI 2-to-1 multiplexer and distribution amplifier

- MPEG2 Transport Stream Monitor
- Industry unique Template Matching
- Independent selection of monitored stream and distribution amplifier input
- User programmable minimum and maximum TS bitrate thresholds
- Fully programable TR101290 monitoring to match each transmission system specifications
- TR101290 parameters checked:
- TS_Sync_Loss
- Sync_Byte_Error
  - ✓ PAT_Error
  - ✓ Continuity_Count_Error
  - ✓ PMT_Error
  - ✓ PID_Error
  - ✓ Programmable timeouts on all PIDs
  - ✓ 2.1 Transport_Error
  - ✓ 2.2 CRC_Error
  - ✓ 3.4 Unreferenced_PID
  - ✓ Other Monitoring:
  - ✓ Illegal Characters
  - ✓ Packet size - 188/204/208
  - ✓ Template matching in real time against 10 user programmable/downloadable PSI/SI templates
- Parameters matched in template:
  - ✓ Network_id
  - ✓ Transport stream_id
  - ✓ Transport Stream bitrate (min/max)
- Packet size
- Number of services
- Service_ids
- Number and PIDs of components in each service
- Bitrate of video and audio PIDs (max/min)
  - ✓ Encryption status of each component
  - ✓ Running Status Table (RST) content
  - ✓ Quick selection of up to 8 preset configurations
  - ✓ Quick selection of up to 10 locally stored templates
  - ✓ Equalized and transformer coupled input
  - ✓ Input auto-select mode allows unit to switch inputs on detection of pre-determined conditions
  - ✓ 4/8 Reclocked and transformer coupled outputs
  - ✓ Passive relay input bypass option
- 2 Configurable GPI ports
- RollCall remote control

IQMDDM Features

ASI 2-to-1 multiplexer and distribution amplifier

- MPEG2 Transport Stream Monitor
- Independent selection of monitored stream and distribution amplifier input
- User programmable minimum and maximum TS bitrate thresholds
- Fully programable TR101290 monitoring to match each transmission system specifications
- TR101290 parameters checked:
- TS_Sync_Loss
- Sync_Byte_Error
- PAT_Error
- Continuity_Count_Error
- PMT_Error
- PID_Error
- Programmable timeouts on all PIDs
- 2.1 Transport_Error
- 2.2 CRC_Error
- 3.4 Unreferenced_PID
- Other Monitoring:
  - ✓ Illegal Characters
  - ✓ Packet size - 188/204/208
  - ✓ Equalized and transformer coupled input
  - ✓ Input auto-select mode allows unit to switch inputs on detection of pre-determined conditions
  - ✓ 4/8 Reclocked and transformer coupled outputs
  - ✓ Passive relay input bypass option
- 2 Configurable GPI ports
- RollCall remote control

IQMDDM-T Technical Profile

Features

Signal Inputs

ASI 1 .....ASI (270 Mbit/s)

ASI 2 .....ASI (270 Mbit/s)

Standards.....DVB-ASI, EN50083-9 section 4.3.

GPI 1.....(-2 only) Configurable as:
1) Data polarity switch
input-Closing contact
2) Loss of signal warning

GPI 2.....(-2 only) Configurable as:
1) Data polarity switch
input-Closing contact
2) Loss of signal warning

Signal Outputs

Serial Data.....Up to 8 ASI (270 MBit/s)

Note: Do not cascade more than 5 –RR modules

Standards.....DVB-ASI, EN50083-9 section 4.3.

Card Edge Controls (also available via RollCall)

DA Input Select .....Input 1/ Input 2

Indicators

Power OK.....2 x Green LED

ASI 1 Signal absent.....Red LED

ASI 2 Signal absent.....Red LED

ASI 1 selected .....Yellow LED

ASI 2 selected .....Yellow LED

Functions Available via RollCall™ Only

DA Input Select..... Input 1/Input 2/Auto

Log signal loss..... Off/input 1/input 2/either input

Log TR101290 error..... Off/enable individual parameters

Set PID timeout ..... video/audio/data/PAT/PMT
1 ms – 1000 s

Show error counts..... Sync/ETR/RVS/input loss/all
(any combination)

Reset error counts ..... Sync/ETR/RVS/input loss/all
(any combination)

GPI configuration..... Input/Output

GPI sense..... Inverted/Non-inverted

GPI 1 trigger..... Input1 loss/input 2 loss/either input loss/sync loss/TR101290 error/Bitrate threshold error/Carr-Sync-BR
(any combination)

GPI 2 trigger..... input1 loss/input 2 loss/either input loss/sync loss/TR101290 error/Bitrate threshold error/Carr-Sync-BR
(any combination)

Labeling of inputs ..... up to 8 ASCII characters

Specifications

Serial Input Return Loss .....Better than -15 dB to 270 MHz

Maximum Input Cable Length
>100 m (PSF1/2 or equiv. cable)
(up to 150m combined input and output cable length, -RR version)

Signal Output Level .....800 mV ±10%

Output Return Loss .....Better than -15 dB to 270 MHz

Output Jitter.....< 0.2 UI

Power Consumption

Module Power Consumption
6.9 W max
–RR version 7.15 W max

IQMDDM Technical Profile

Features

Signal Inputs

ASI 1 .....ASI (270 Mbit/s)

ASI 2 .....ASI (270 Mbit/s)

Standards.....DVB-ASI, TR101290

GPI 1.....(Double width only) configurable as:
1) Data polarity switch input-Closing contact
2) Loss of signal warning

GPI 2.....Configurable as:
1) Data polarity switch input-Closing contact
2) Loss of signal warning

Signal Outputs

Serial Data.....Up to 8 ASI (270MBit/s)

Standards.....DVB-ASI, TR101290

Note: Do not cascade more than 5 –RR modules

Card Edge Controls (also available via RollCall)

DA Input Select .....Input 1/ Input 2

Indicators

Power OK.....2 x Green LED

ASI 1 Signal absent.....Red LED

ASI 2 Signal absent.....Red LED

ASI 1 selected .....Yellow LED

ASI 2 selected .....Yellow LED

Functions Available via RollCall™ Only

DA Input Select..... Input 1/Input 2/Auto

Log signal loss..... Off/input 1/input 2/either input

Log TR101290 error..... Off/enable individual parameters

Set PID timeout ..... video/audio/data/PAT/PMT
1 ms – 1000 s

Show error counts..... Sync/ETR/RVS/input loss/all (any combination)

Reset error counts ..... Sync/ETR/RVS/input loss/all (any combination)

GPI configuration..... Input/Output

GPI sense..... Inverted/Non-inverted

GPI 1 trigger..... Input1 loss/input 2 loss/either input loss/sync loss/TR101290 error/Bitrate threshold error/Carr-Sync-BR (any combination)

GPI 2 trigger..... input1 loss/input 2 loss/either input loss/sync loss/TR101290 error/Bitrate threshold error/Carr-Sync-BR (any combination)

Labeling of inputs ..... up to 8 ASCII characters

Specifications

Serial Input Return Loss .....Better than -15 dB to 270 MHz (12 dB to 270 MHz for -RR versions)

Maximum Input Cable Length
>100 m (PSF1/2 or equiv. cable) (up to 100m combined input and output cable length, -RR version)

Signal Output Level .....800 mV ±10%

Output Return Loss .....Better than -15 dB to 270 MHz

Output Jitter.....< 0.2UI

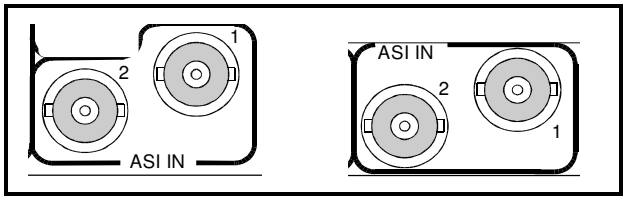
Power Consumption

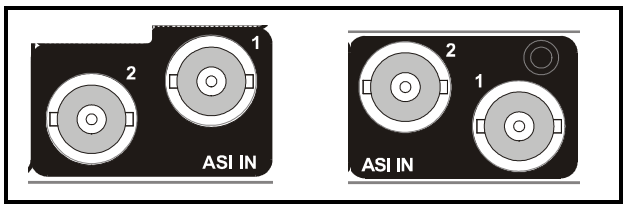
Module Power Consumption
6.9W max
–RR version 7.15 W max

INPUT CONNECTIONS

ASI Input

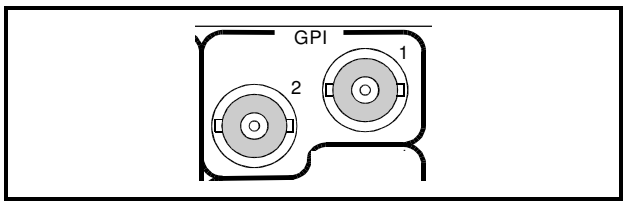
The ASI inputs to the unit are made via these BNC connector which terminate in 75 Ohms.

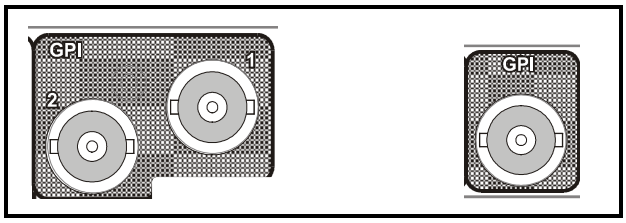




GPI Inputs

These GPI ports are a closed contact type. When enabled they are configurable to any RollCall control or reporting parameter.

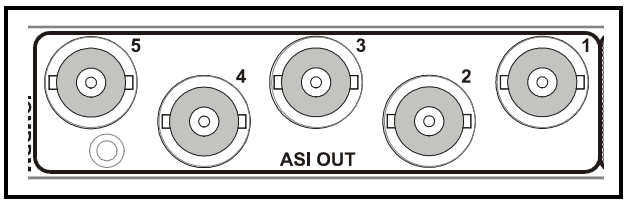


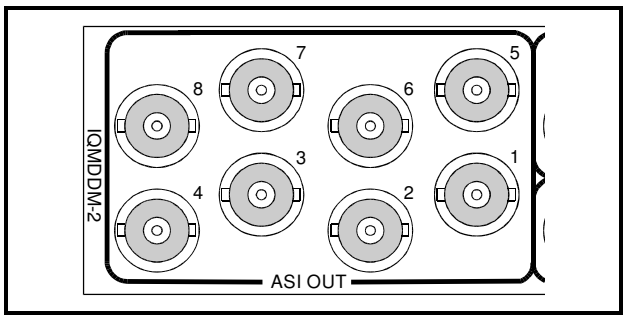


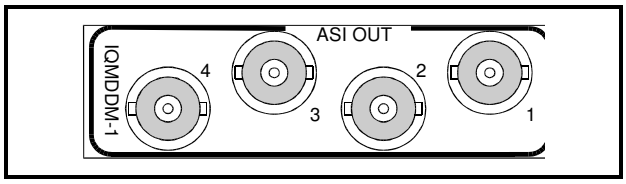
OUTPUT CONNECTIONS

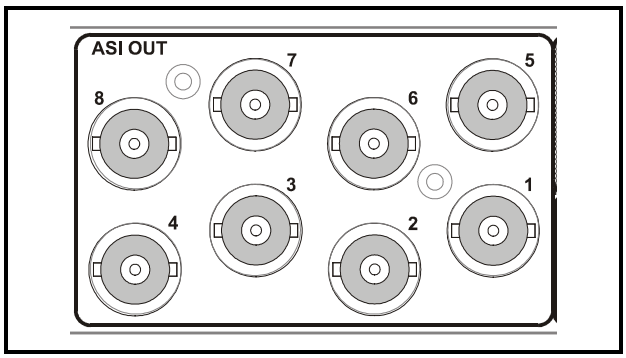
ASI Outputs

These are the isolated ASI outputs of the unit via BNC connectors for 75 Ohms.

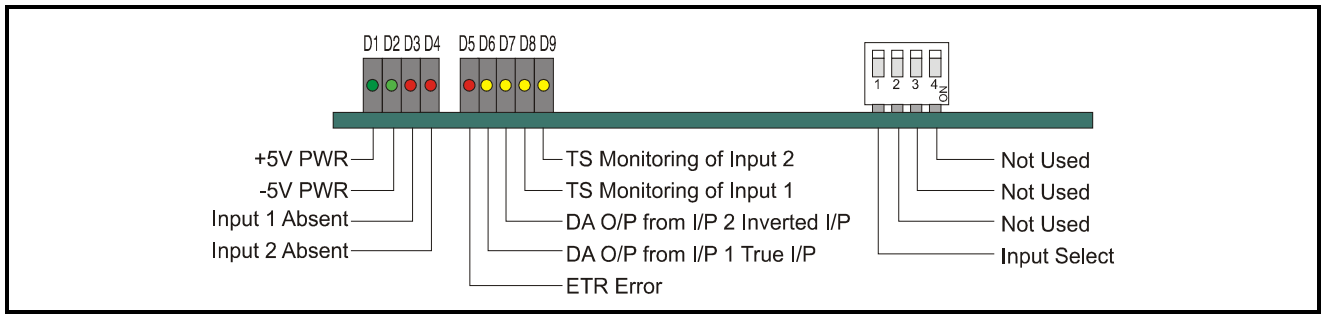








CARD EDGE CONTROLS



LED INDICATORS

D1
When illuminated, D1 indicates that the +5 V power supply is present.

D2
When illuminated, D2 indicates that the –5 V power supply is present.

D3
When illuminated, D3 indicates that Input 1 signal is not present.

D4
When illuminated, D4 indicates that Input 2 signal is not present.

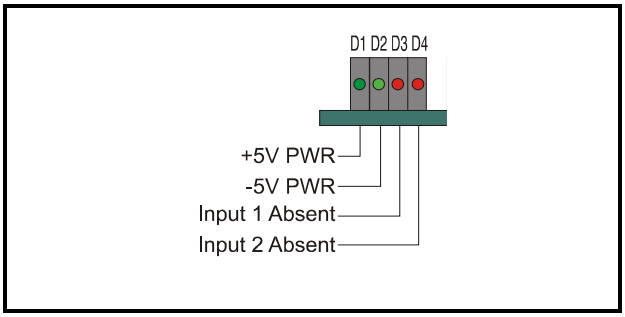
D5
When illuminated, D5 indicates that an ETR290 error has occurred.

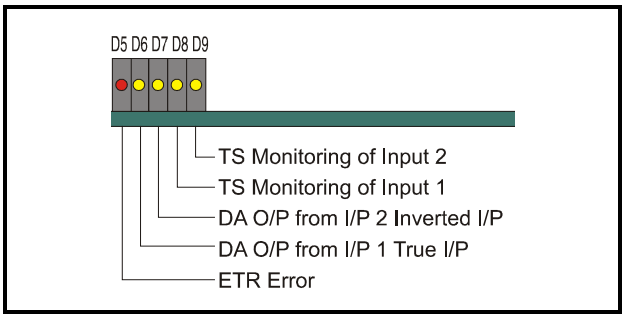
D6
When illuminated, D6 indicates that the distribution amplifier output is derived from Input.

D7
When illuminated, D7 indicates that the distribution amplifier output is derived from Input 2.

D8
When illuminated, D8 indicates the BS Monitoring is of Input 1.

D9
When illuminated, D9 indicates the BS Monitoring is of Input 2.





Menu Details via PC RollCall Remote Control

Errors Menu

This menu gives a summary of all the errors that the module is capable of monitoring.

Each category has:

A **Status** window

This indicates if the category of error is currently in error or not. The status can be either "**FAIL**" or "**OK**"

A **Show Stats** (statistics) check box

Checking this box will cause the current status and number of errors flagged to be shown in the **Information** window in the top right-hand corner.

A **Reset Stats** (statistics) button

Pressing this button will cause the error count for the error category in question to be zeroed.

All Stats
This is the logical OR of all the other categories

The following error categories are listed:

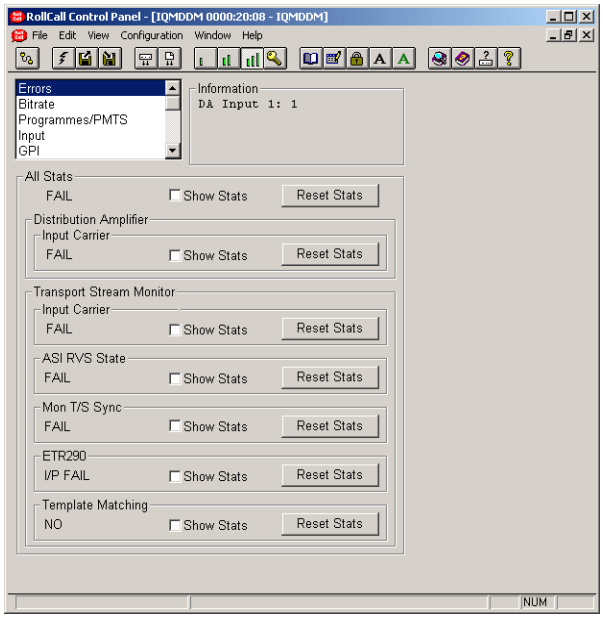
Distribution Amplifier/Input Carrier

This field indicates whether an ASI carrier signal is detected at DA input.

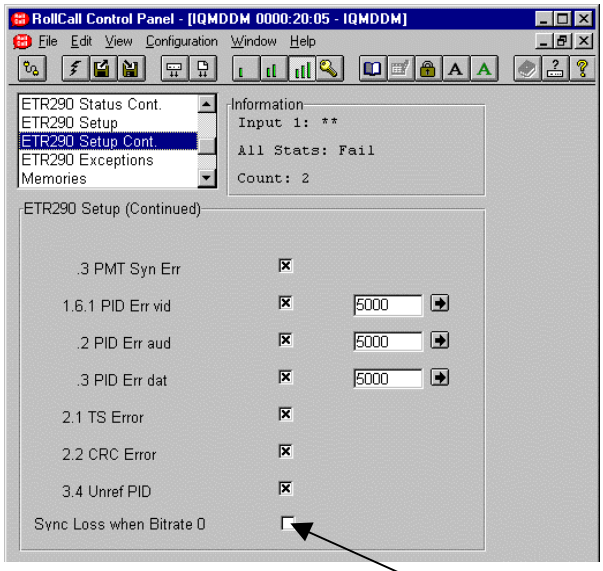
Transport Stream Monitor/Input Carrier
This field indicates whether an ASI carrier signal is detected at the Monitor input.

ASI RVS State
Receive Violation Signal. This error occurs when illegal characters are detected on the input stream, which means that the 10B/8B conversion cannot be done correctly.

ETR290
This error occurs if any of the ETR290 parameters monitored fails. The error counter will only increment if the particular ETR290 error is enabled (see **ETR Setup** menus).



Mon T/S Sync
This error is activated if there is a transport stream synchronization loss on the monitored input.



If a valid input is removed and **Sync Loss when Bitrate 0** is not enabled the Mon T/S Sync indication may still indicate OK. The FAIL state may require to be indicated here for loss of input. For this to happen the **Sync Loss when Bitrate 0** option must be enabled from the ETR290 Setup (Continued) menu. Default is not enabled.

Current Input Loss Errors
This error occurs if the data carrier disappears on the input being reclocked and routed through the distribution amplifier outputs.

IMPORTANT:
In case of an Input Loss Error at the distribution amplifier input (i.e. the input may not be connected), the Transport Stream Monitor flags may indicate no error as that part of the circuit becomes only active when the ASI receiver gets a compliant electrical signal.

NOTE:
If RollCall is not operated in user levels of engineer and above access to some menu structures is not possible.

Template Matching Errors
This error occurs if the input being monitored does not match up with one of the templates in the sequence set
(see **Tempate Selection** Menu).

N.B. If the module does not have the template matching feature enabled this field will be grey and its status will be "**DISABLED**".

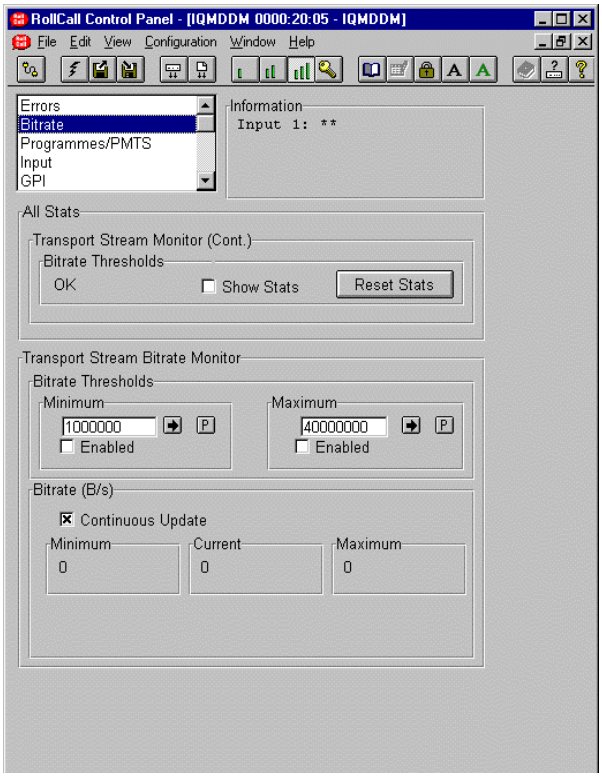
Bitrate

The MGB2 Profile provides overall consistent rate calculations while providing reasonable accuracy for most monitoring and troubleshooting applications.

- Time slice: 100 ms
- 10 timeslices = 1 second
- Element: 188/204/208 byte packet

The current bitrate on the IQMDDM is calculated every 100ms. Due to the nature of the MGB2 profile, the minimum quantisation of the bitrate is a TS packet size e.g. 1504 bits/s @ 188 byte packets.

A user specified minimum and maximum bitrate threshold can be programmed. A violation of those thresholds generates a log entry (min & max) and/or switches inputs. This is a reliable way to detect an "empty" stream where carrier and synch character is still valid but no active data occurs in the ASI stream.



Programmes/PMTS menu

This menu shows the services present in the transport stream and the components that comprise each one.
The menu has the following fields:

Radix

This field allows the user to select the number base for the display of program numbers and PIDs, in decimal (Base 10 or Dec) or in hexadecimal (Base 16 or Hex)

Display

This field controls what is displayed in the **Prog no. -> PMT PID** window.

There are 2 options:

Programme Names
This causes the program descriptors, as found in the Service Descriptor Table (SDT) to be shown (see illustration)

Programme Numbers and PMT PIDs
This causes the programme numbers to be displayed, each together with the Packet ID on which the Programme Map Table (PMT) for the programme should be found. This information is extracted from the Programme Association Table (PAT).

Transport Stream ID

This field shows the Transport Stream ID for the input being monitored

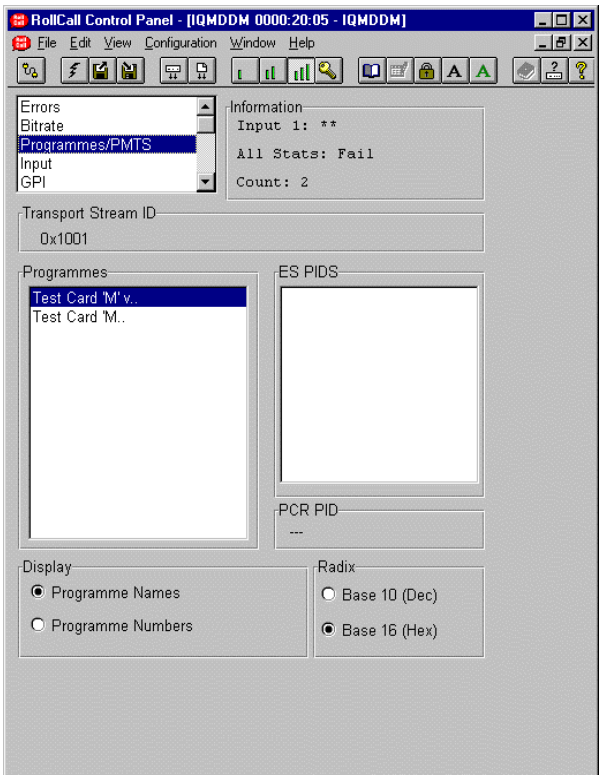
Prog no. -> PMT PID

This window displays information extracted from the PAT indicating which programmes (services) are contained in the transport stream being monitored. The format of the information is determined by the option selected in the **Display** field (see above). When a programme is selected, by clicking on it with the cursor, the components comprising it are displayed in the **ES PIDs** window.

ES PIDS

This window shows the PID and type of all the Elementary Streams which make up the programme selected in the **Prog no. -> PMT PID** window.

PCR PID
This field shows the PID on which the PCR can be found for the currently selected programme.



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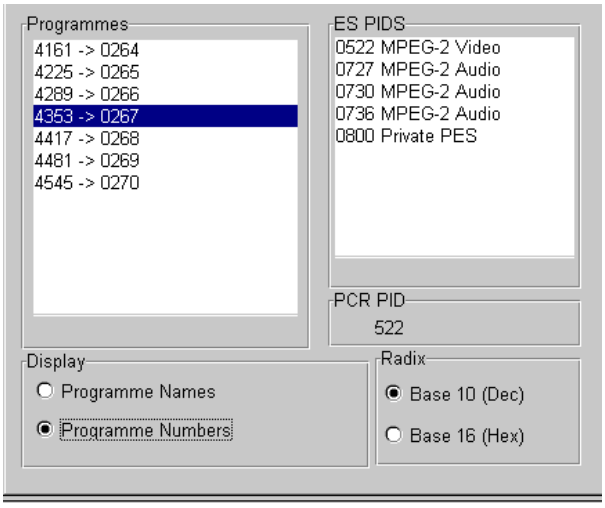


Input Menu

This menu allows the enabling or disabling of any of the error categories described in the Errors Menu section. It also controls the routing of the input signals to the two functional blocks in the module.

Note that for predictable operation it is advised that both D/A and MON (Monitor) selection should be kept in sync. Otherwise input switching might be triggered by two opposite conditions resulting in a continuous switching operation.

The menu has the following fields:

Input Select (D/A)
This field controls which of the 2 ASI inputs is reclocked and routed through to the distribution amplifier outputs.

The options are:

Auto Select – When selected, this will remain with the current input if there is a valid signal on it. If there is not, or the signal disappears, the module will switch to the other input, providing that there is a valid signal on that input. If there is no valid signal on either input then the module will revert to input 1.

Auto (Car/Sync/BR)

When selected, this will remain with the current input if there is a valid signal on it. The module will switch to the other input if at least one of the following conditions is true:

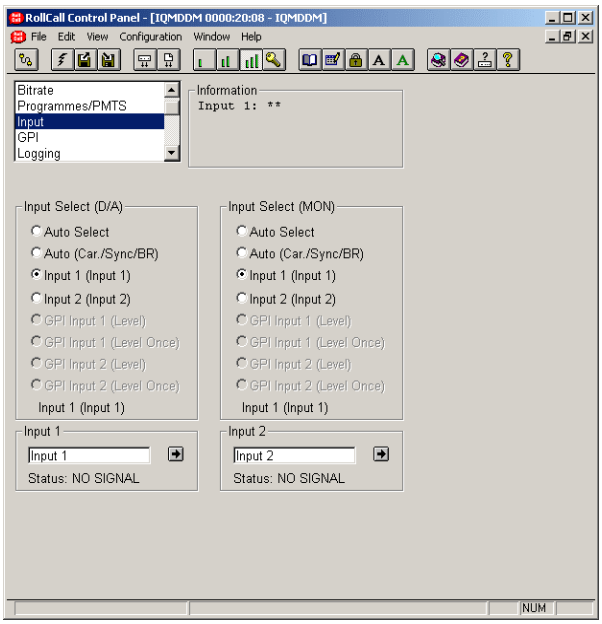
- No valid signal on the current Input
- TS sync loss on the Monitor Input
- Minimum Bitrate violation (if enabled) on the monitor Input

NB: If the DA Input is set to Auto (Car/Sync/BR), and the monitor input is not set to Auto (Car/Sync/BR), the DA Input will oscillate if carrier is present on both inputs, and there is a fault condition (sync loss or bitrate violation) on the monitor input.

Input 1 – When selected, this will force the distribution amplifier outputs to be a reclocked copy of the signal on input 1.

Input 2 - When selected, this will force the distribution amplifier outputs to be a reclocked copy of the signal on input 2.

GPI Input (Level) – When selected, the routing of the input signals will be controlled by the level of the GPI port, provided that the GPI port is configured as an input (see **GPI Menu**).



GPI Input (Level Once) - When selected, the routing of the input signals will be controlled by the level of the GPI port, provided that the GPI port is configured as an input (see **GPI Menu**). However, once the GPI has triggered an input change (switch from Input 1 to Input 2 or vice-versa), the unit will stop switching inputs until RollCall is used to change the input select back to GPI Input (Level Once).

Input Select (MON)

This field controls which of the 2 ASI inputs is reclocked and routed through to the transport stream monitor. The options are the same as for **Input Select (D/A)** above.

Input 1

This field allows the user to assign a name to input 1 and to view its status.

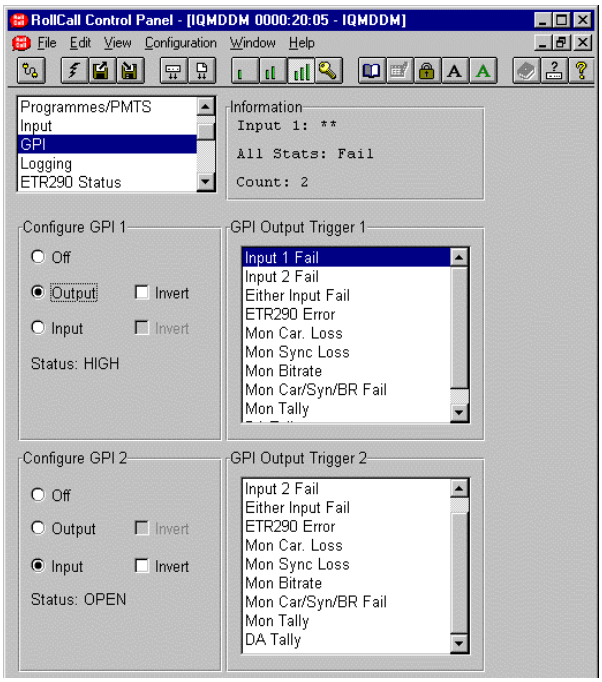
NAME – The name is entered in the text box and assigned by clicking on the right arrow send button.

STATUS – The line underneath the text box indicates whether a signal has been detected on input 1. It will show either OK or NO SIGNAL.

Input 2

This field allows the user to assign a name to input 2 and to view its status.
(see **Input 1**)

GPI Menu



This menu controls the configuration of the GPI port available on the double width module.

The menu has the following fields:

Configure GPI

This controls the direction of the GPI port. Only one option may be checked.

The options are:

Off – This will inactive the GPI port.

Output – This will configure the GPI port as an output controlled by the options selected in the **GPI Output Trigger** field below.

If the invert box is *not* checked then GPI 1 will give a **LOW** output with no error and a **HIGH** output when an error occurs. Checking the invert box will give the opposite behavior.

Input – This will configure the GPI port as an input, which can control the input routing of the distribution amplifier (see **Setup Menu**).

If the invert box is *not* checked then an **OPEN** contact across the GPI port will cause Input 1 to be routed to the outputs and a **CLOSED** contact will select Input 2. Checking the invert box will give the opposite behavior.

GPI MENU (continued)

GPI Output Trigger

This field controls which errors can change the state of the GPI port when it is configured as an output. Any number of options may be checked at the same time. The GPI error is the logical OR of all the checked options.

The options are:

Input 1 Loss
When checked, this will signal an error on the GPI output when no data carrier is detected on input A.

Input 2 Loss
When checked, this will signal an error on the GPI output when no data carrier is detected on input B.

Either Input Loss
When checked, this will signal an error on the GPI output when either of the 2 inputs losses the data carrier.

ETR290 Error
When checked, this will signal an error on the GPI output when any of the enabled ETR290 errors is in an error condition (see **ETR290 Setup Menus**). Note that loss of carrier, or a signal without data does not necessarily cause an ETR290 error.

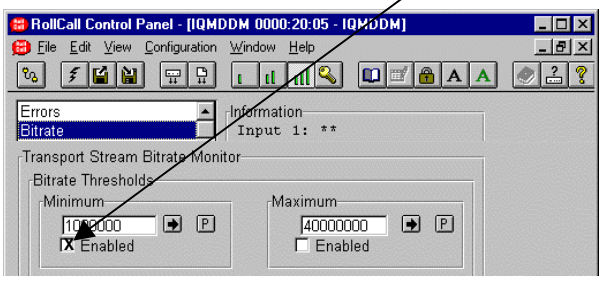
Mon Car. Loss

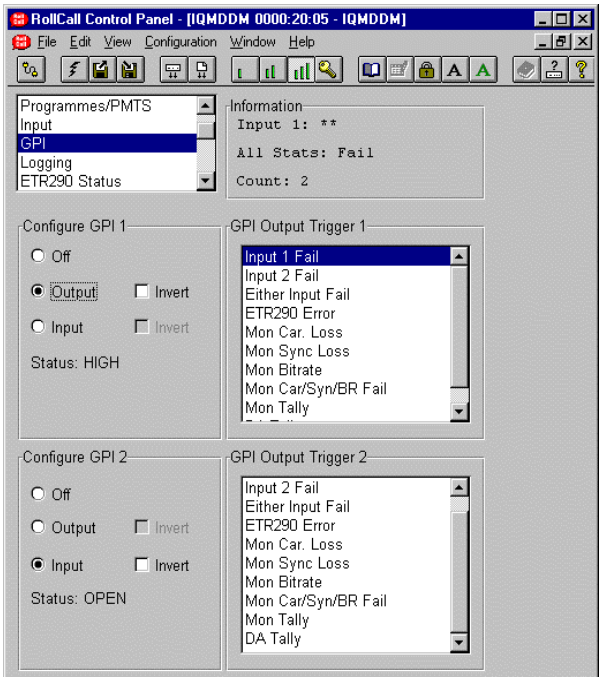
When checked the unit will signal a loss of carrier on for the monitoring function on the GPI port.

Mon Sync Loss
When checked, this will signal an error on the GPI output when no transport stream sync is detected on the currently selected input. Note that loss of carrier, or signal without data does not imply loss of sync.

Mon Bitrate*
When checked the unit signals a bitrate threshold violation.

*Note that for these functions to operate the **Transport Stream Bitrate Monitor/Bitrate Thresholds/Minimum *Enabled*** function in the **Bitrate** screen must be checked.





Mon Car/Syn/BR/Fail

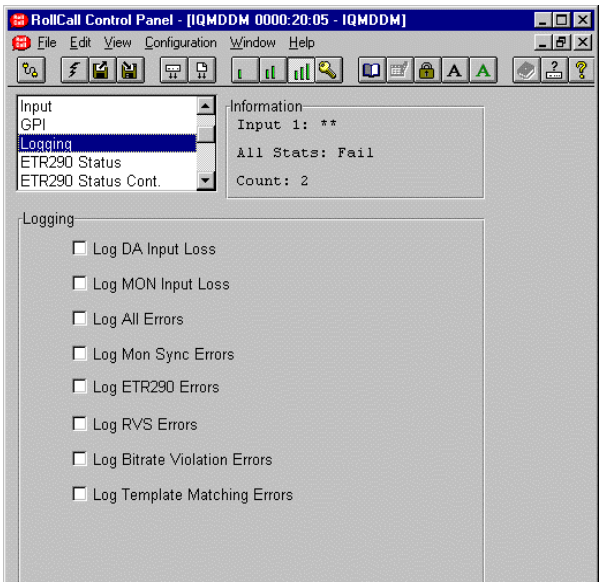
When checked the unit will signal an error if:
* Carrier is lost on the input used for the TS Monitor
* Sync is lost
* Bitrate is below threshold. *

This combination error provides more useful indication of many catastrophic input failures including a condition in which the ASI interface receives no data.

Mon Tally/ DA Tally

When checked the unit will indicate using the GPIO which ASI input is currently selected for the [DA/Monitoring] function. Logic low (off) indicates input 1, whereas logic high (on) indicates input 2.

Logging Menu



This menu controls the generation of error messages to be logged by a RollCall logserver somewhere on the network (see RollCall user manual).
The menu consists of a list of all the possible error events that can trigger a RollCall log message. Each can be individually enabled or disabled by checking or clearing the associated check box. The following categories are listed:

Log Input Loss

This error occurs if the data carrier disappears on the input being monitored.

Log All Errors

This is the logical OR of all the other categories

Log Sync Errors

This error is activated if there is a transport stream sync loss on the monitored input

Log ETR290 Errors

This error occurs if any of the ETR290 parameters monitored fails. The error counter will only increment if the particular ETR290 error is enabled (see **ETR Setup** menus)

Log RVS Errors

Receive Violation Signal. This error occurs when illegal characters are detected on the input stream, which means that the 10B/8B conversion cannot be done correctly

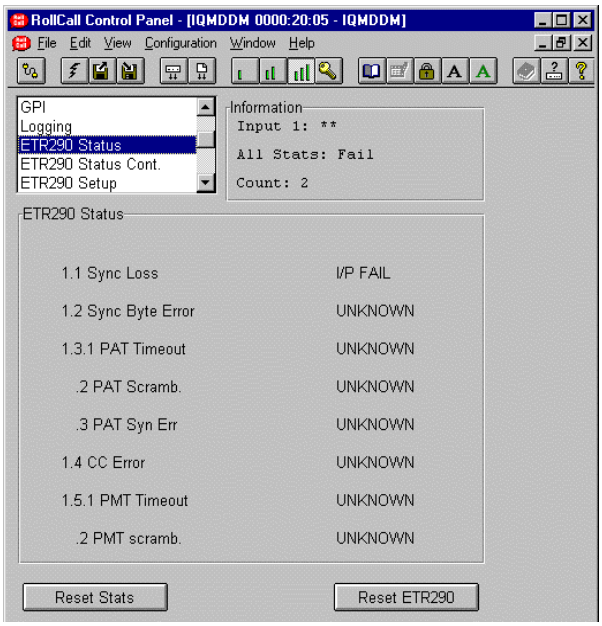
Log Template Matching Errors

This error occurs if the input being monitored does not match up with one of the templates in the sequence set,
(see **Tempate Selection** Menu).

N.B. If the module does not have the template matching feature enabled this field will be grey.

Log Bitrate Violation Errors

ETR290 Status Menus



These menus show the current status of all the ETR290 errors monitored by the module.

The menu has the following fields:

ETR290 Status

This field shows each individual ETR290 errors that can be monitored by the module and its current status.

The status can assume one of three states:

OK – No error of this kind has occurred since the last reset.

FAIL – An error of this kind has occurred in the last 1 second.

HAS FAILED – An error of this kind has occurred since the last reset but not in the last 1 second.

Reset Stats

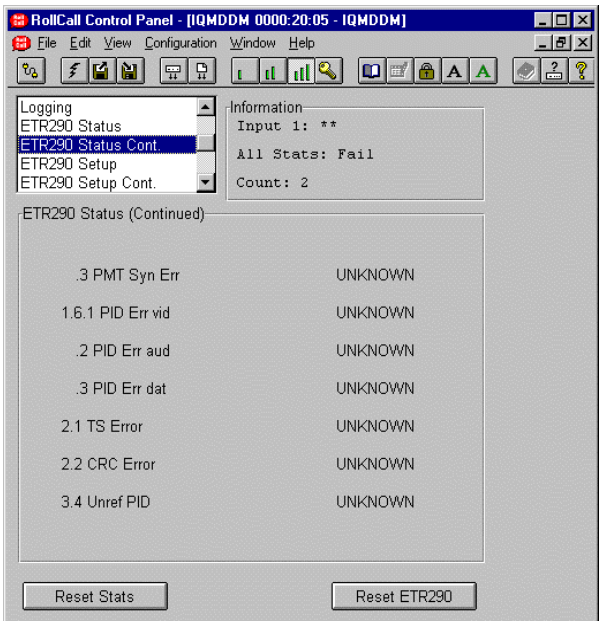
Pressing this button causes the error counter for ETR290 to be reset to zero. It will also reset all of the **HAS FAILED** indicators to **OK**.

Reset ETR290

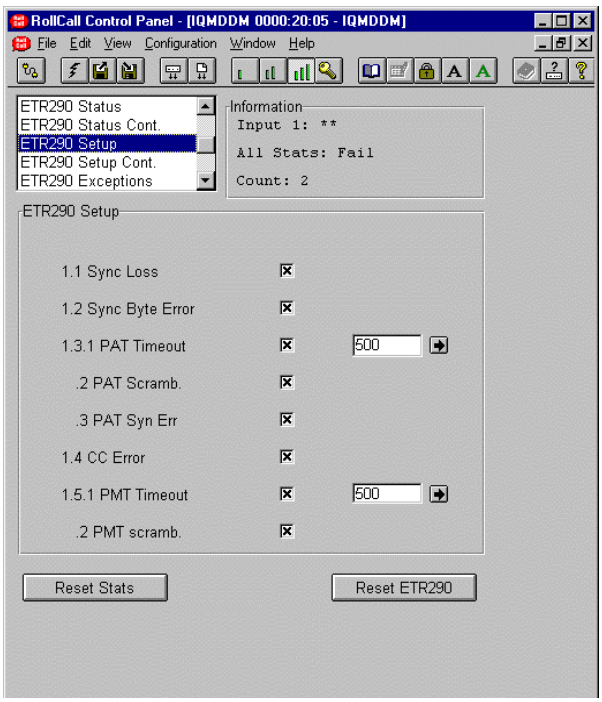
Pressing this button causes all of the transport stream tables to be reacquired and the error monitoring restarted. There is a hold-off period of 5 seconds from reacquisition before error monitoring is restarted. During this period the status of all errors is shown as **ACQUIS.**

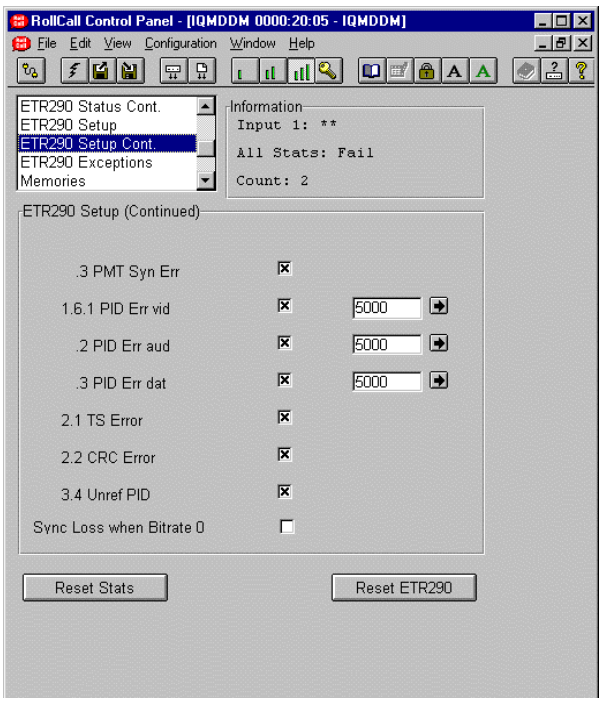
ETR290 Status (Continued)

This field shows another set of individual ETR290 errors that can be monitored by the module and its current status. See status details in previous section.



ETR290 SETUP MENUS





These menus show the current status of all the ETR290 errors monitored by the module.

The menu has the following fields:

ETR290 Level x.x-x.x

This field shows each individual ETR290 error that can be monitored by the module together with a check box to include it in the ETR290 error logging. The ETR290 error that generates a log message and/or a GPI output is the logical OR of all the checked errors.

The timeout value of PATs and PMTs can be changed from the DVB default value of 500ms, as can the timeout values for video, audio and data PIDs.

The value required in milliseconds is entered into the relevant box and set on the module by pressing the right arrow send button to the right of the box.

N.B. The timeout values set by these menus apply between packets *of the same PID*.

Sync Loss when Bitrate 0

This will monitor an ETR290 sync loss for a "carrier only stream", i.e. a valid ASI but no data is detected.

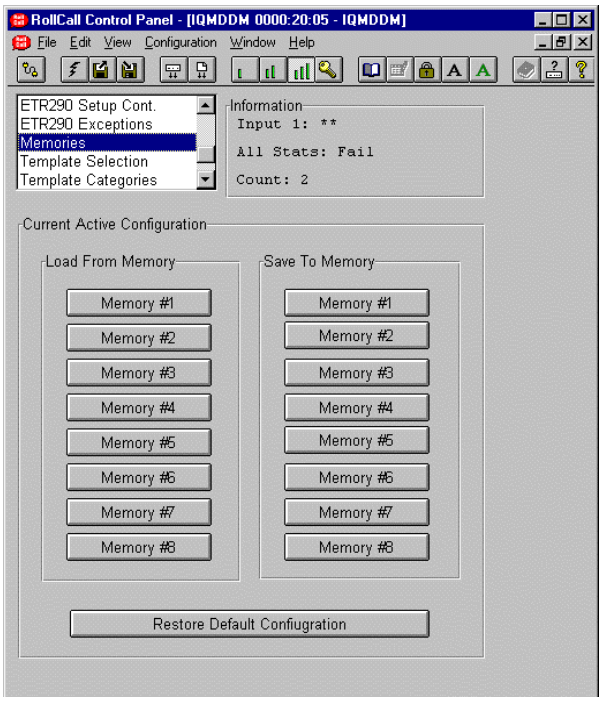
Reset Stats

Pressing this button causes the error counter for ETR290 to be reset.
(see **ETR290 Menus**).

Reset ETR290

Pressing this button causes all of the transport stream tables to be reacquired and the error monitoring restarted.
(see **ETR290 Menus**).

Configuration Memories Menu



This menu allows the complete configuration of the module to be stored or retrieved in one of 8 locally held configuration memories.

The menu has the following fields:

Load From Memory

This field contains one button for each of the 8 locally stored configuration memories. Pressing one of these buttons causes all of the control parameters of the module to be set from the selected memory.

N.B. Loading from one of the configuration memories will cause all of the current parameter settings to be lost. No warning is given when this happens. If you wish to return to the current state the settings must first be saved in another of the configuration memories (see Save To Memory)

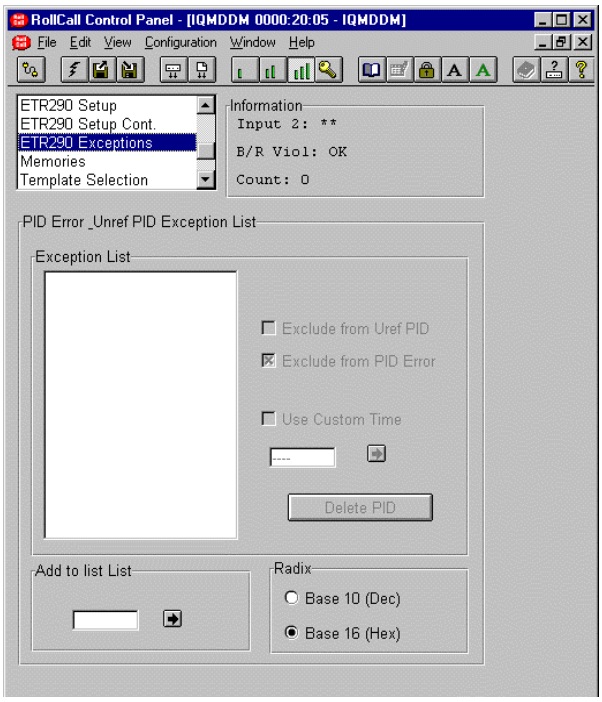
Save To Memory

This field contains one button for each of the 8 locally stored configuration memories. Pressing one of these buttons causes the current state of all the control parameters of the module to be saved to the selected configuration memory.

Restore Default Configuration

Pressing this button causes all of the control parameters of the module to be set to the factory default settings.

ETR290 Exceptions Menu



This menu allows specific Packet IDs to be excluded from the unreferenced PID error check and/or the PID error check or to set a PID error timeout value specifically for one PID.

The menu has the following fields:

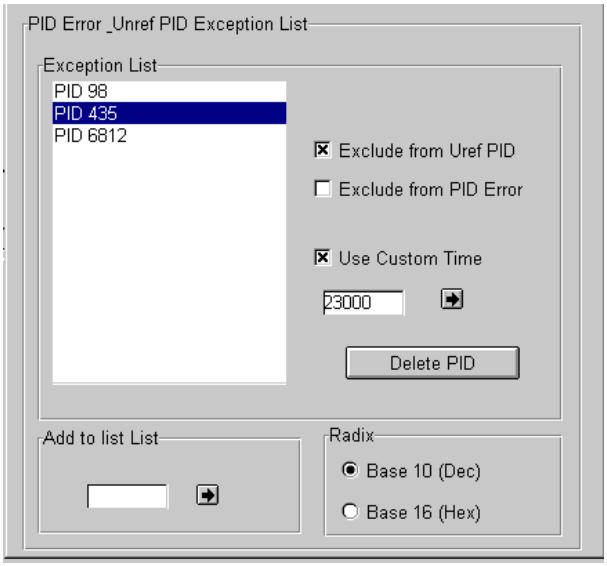
PID Exception List

This field contains a list of the PIDs for which exclusions can be defined.
A PID can be removed from the list by selecting it and pressing the **Delete PID** button.

Selecting a PID in this list will cause the 3 check boxes to show the exclusion status of that PID:

Exclude from Unref PID

A check in this box will ensure that no unreferenced PID error will be generated even if transport packets with that PID are present in the stream but cannot be found in any of the PSI tables



Exclude from PID error

A check in this box will disable the checking of timeouts between packets with that PID even if it is of a type (PAT, PMT, Video, Audio, Data) for which a timeout has been set and enabled in the ETR290 Setup Menus.

Use Custom Time

A check in this box will allow the PID error (the timeout between packets of that PID) to be checked against a custom value independently of the value which may have been set for it as part of a group in the ETR290 Setup Menus.

The custom time is entered in the accompanying text box (in milliseconds).
The value on the module is not changed until the right arrow send button is pressed

Add to List

PIDs to be added to the exclusion list are entered in this text box (in hexadecimal) and added by pressing the right arrow send button.

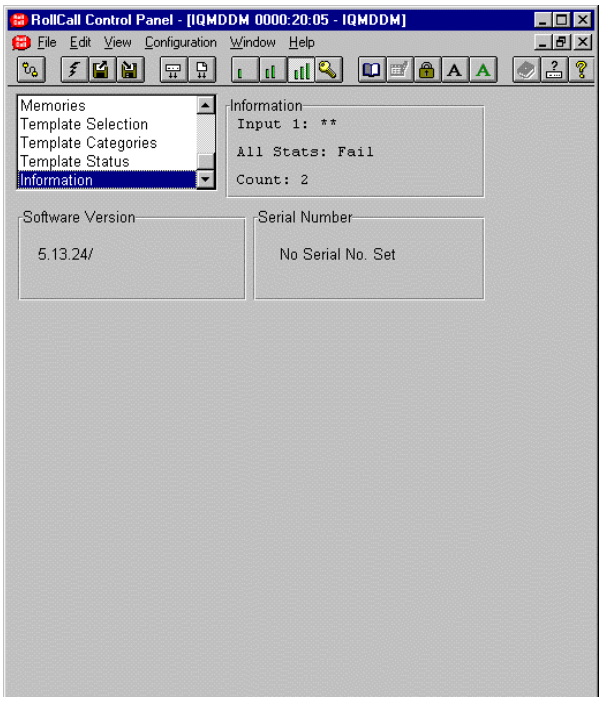
Radix

This field allows the user to select the number base for the display of PIDs – either hexadecimal or decimal

N.B. This field also affects the display of PIDs and program numbers in the **Programmes/PMTs** menu.

Information Menu

This menu shows the serial number of the module and the version of software that is loaded on it.



Template Selection Menu

NOTE: This menu will only appear for the IQMDDM-T versions

This menu controls the selection, naming and prioritisation of SI/PSI templates.

NOTE: A template contains the set of data described in the "Template Categories Menu". Used as a reference, templates are particularly useful to check some high-level parameters contained in the transport stream.

The menu has the following fields:

Available Templates

This field contains the names of the unused templates currently available for matching. The module can hold up to 10 templates at any one time

Template Sequence

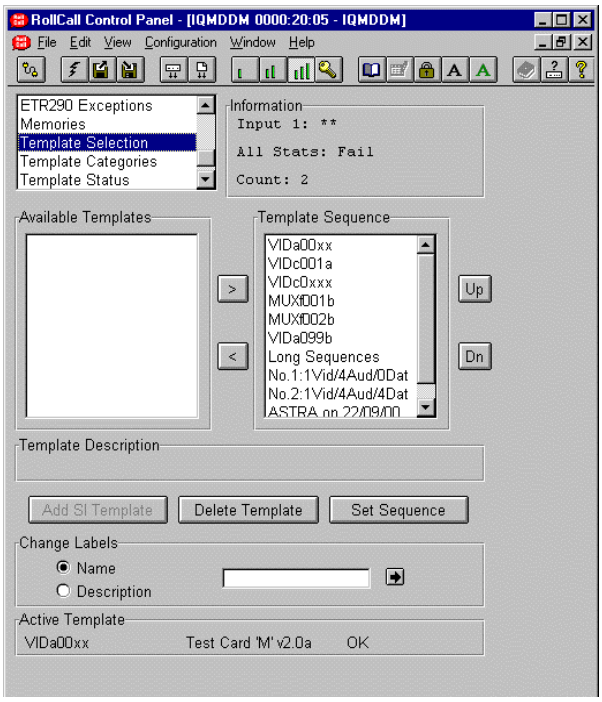
This field contains the names of the templates against which the transport stream is currently being compared. When the module is searching for a template match in a stream, it will compare against templates in the order defined in this list from top to bottom.
A template can be added to this list by selecting it in the Available Templates list and clicking the [>] button.
Similarly, to remove a template from this list, select it and click on the [<] button.
Templates are always added to the end of a sequence. To change the priority of a template, select it in the sequence list and click on the “Up” or “Dn” buttons as required.
No changes are made to the module until the Set Sequence button is pressed.

Template Description

This field shows the text description of the last template to be selected in either the Available Templates or template Sequence list.

Set Sequence

Once the desired template sequence has been edited, press this button to effect the changes to the module. If the Template Selection menu is left without pressing the Set Sequence button, all the changes to the template sequence will be lost.



Add SI Template

Clicking on this button will generate a template from the SI/PSI information in the currently monitored transport stream. The new template will be added to the available template list with the default name: “x Template from SI”, where x is a unique number, and the default description: SI: {*date*} {*time*}.

Change Labels

This field is for changing either the name or description string for a particular template. First select the template in whichever list it appears and select either “name” or “description”, according to which string you wish to change. Then click in the text window and type the new string then press the right arrow button to change the name on the module.

Active Template

This field shows the name and description of the first template in the defined sequence which is currently matching the input stream. If no template matches the input stream then this field shows “**FAIL**”.

Template Categories Menu

NOTE: This menu will only appear for the IQMDDM-T versions

This menu defines which parts of the templates are compared against the input stream.
The menu has the following fields:

Template Categories

This field contains a check box for each parameter contained in a template. The template comparison will only be performed for checked parameters in this menu.

The following parameters are listed:

TS ID
The transport stream identification number found in the Program Association Table (PAT).

Packet Format
The total length of the transport stream packets: 188,204 or 208 bytes, depending upon whether and which Reed Solomon (RS) protection codes have been used.

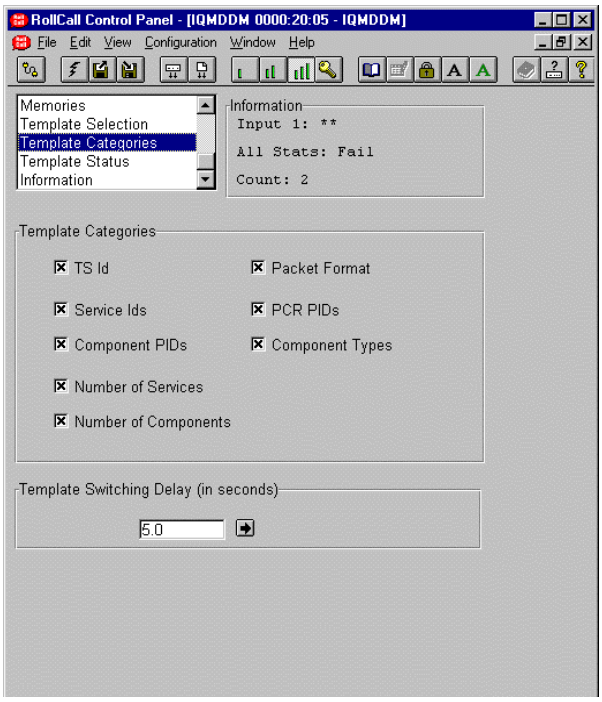
Service IDs
A 16-bit number uniquely identifying each service (program) in the transport stream. Also known as the program_number.

PCR PIDs
The Packet IDentification (PID) numbers of all transport stream packets carrying Program Clock Reference (PCR) timestamps. The PCR PID for each program is found in its associated Program Map Table (PMT).

Component Types
The type of each component (video, audio, etc.) as found in the PMTs.

Component PIDs
The PID of each component in every program in the transport stream as defined in the relevant PMT.

Number of Services
The total number of services (programs) defined in the PAT. If this category is not enabled the template matcher will only check that all of the services defined in the template are present in the stream and generate an error if any are absent. If it is enabled then the presence of any extra services will also cause an error.



Number of components
The total number of components in each service defined in the PMT for that service. If this category is not enabled the template matcher will only check that all of the components defined in the template are present in the stream and generate an error if any are absent.
If it is enabled then the presence of any extra components will also cause an error.

Template Switching Delay

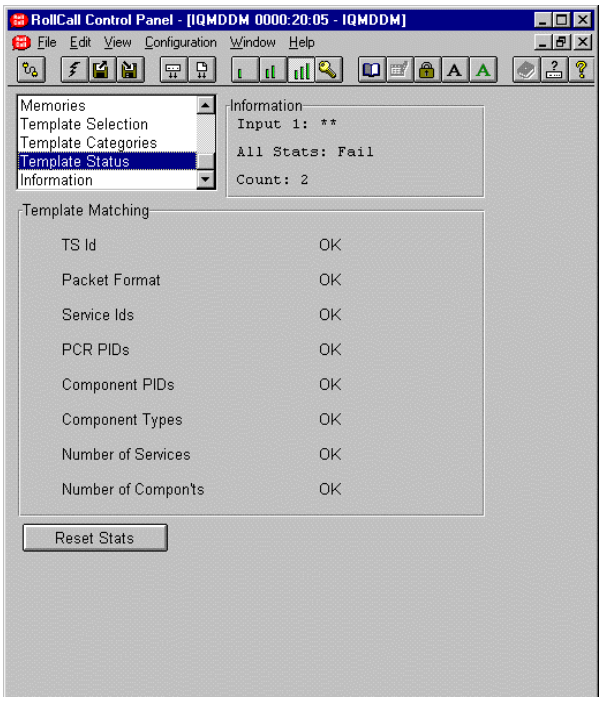
This field allows the user to change the delay between comparing templates in the template sequence (see Template Selection Menu). This delay is to account for the time required to acquire all of the relevant information in the stream.

Any value may be entered but it will be rounded to the nearest 0.5 seconds.

The parameter will not be changed on the module until the right arrow send button is pressed.

Template Status Menu

NOTE: This menu will only appear for the IQMDDM-T versions



This menu shows the current match status for all of the parameters in the template.

The menu has the following fields:

Template Matching

This field contains a line for each parameter contained in a template. The status can assume one of four states:

OK
The value of this parameter in the input stream matches the value in the active template.

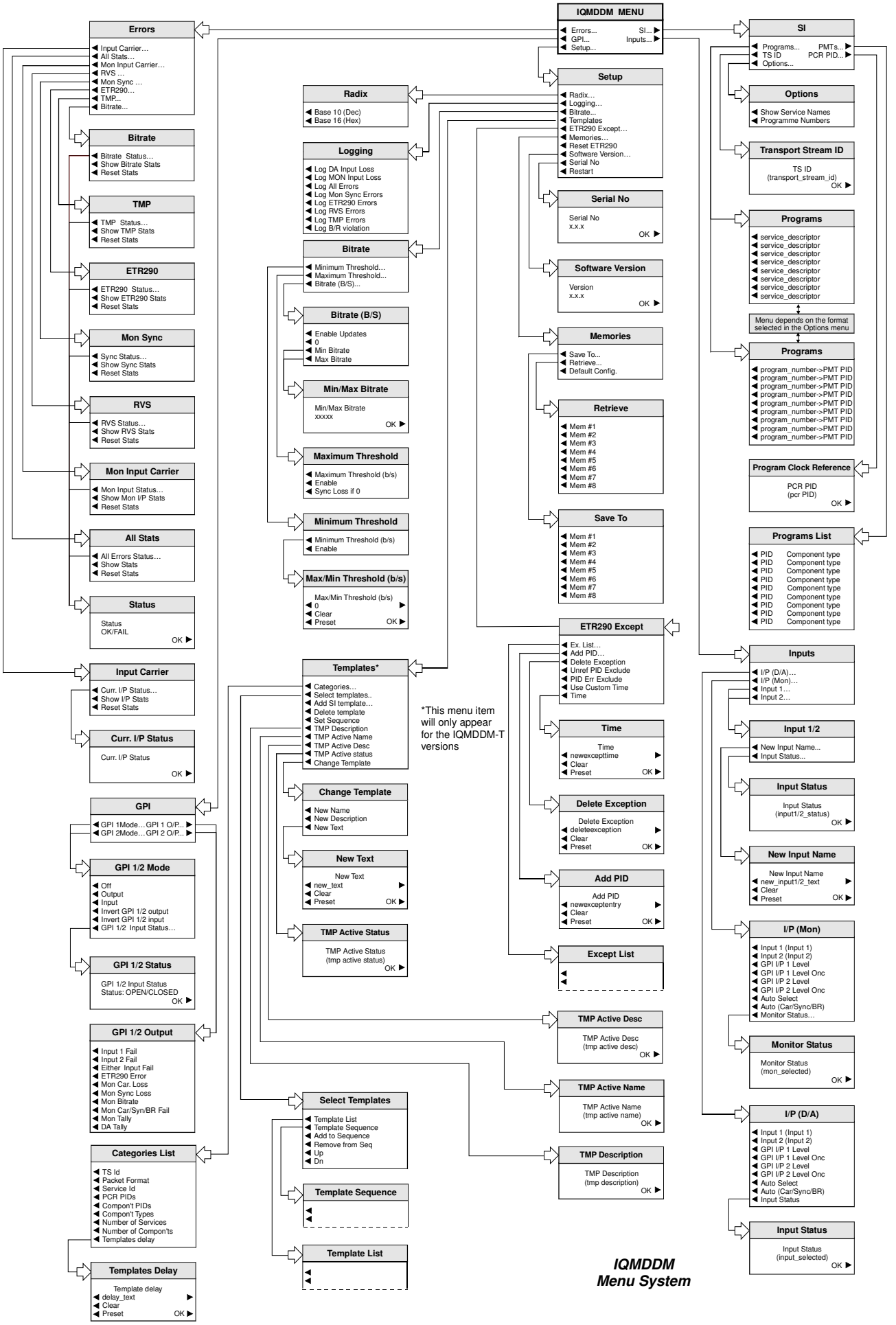
FAIL
The value of this parameter in the input stream does not match the value in any template.

HAS FAILED
The value of this parameter in the input stream did not match the value in one of the templates above the current active template in the template sequence (see Template Selection Menu).

NOT TESTED
The comparison of this parameter against templates has been disabled sequence (see Template Categories Menu).

Reset Stats

This button is pressed to restart the template matching process from the top of the template sequence.

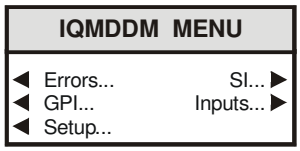

IQMDDM MENU
Errors... SI...
GPI... Inputs...
Setup...
Errors
Input Carrier…
All Stats…
Mon Input Carrier…
RVS …
Mon Sync …
ETR290…
TMP...
Bitrate...
Bitrate
Bitrate Status…
Show Bitrate Stats
Reset Stats
TMP
TMP Status…
Show TMP Stats
Reset Stats
ETR290
ETR290 Status…
Show ETR290 Stats
Reset Stats
Mon Sync
Sync Status…
Show Sync Stats
Reset Stats
RVS
RVS Status…
Show RVS Stats
Reset Stats
Mon Input Carrier
Mon Input Status…
Show Mon I/P Stats
Reset Stats
All Stats
All Errors Status…
Show Stats
Reset Stats
Status
Status
OK/FAIL
OK
Input Carrier
Curr. I/P Status…
Show I/P Stats
Reset Stats
Curr. I/P Status
Curr. I/P Status
OK
GPI
GPI 1Mode… GPI 1 O/P...
GPI 2Mode… GPI 2 O/P...
GPI 1/2 Mode
Off
Output
Input
Invert GPI 1/2 output
Invert GPI 1/2 input
GPI 1/2 Input Status…
GPI 1/2 Status
GPI 1/2 Input Status
Status: OPEN/CLOSED
OK
GPI 1/2 Output
Input 1 Fail
Input 2 Fail
Either Input Fail
ETR290 Error
Mon Car. Loss
Mon Sync Loss
Mon Bitrate
Mon Car/Syn/BR Fail
Mon Tally
DA Tally
Categories List
TS Id
Packet Format
Service Id
PCR PIDs
Compon't PIDs
Compon't Types
Number of Services
Number of Compon'ts
Templates delay
Templates Delay
Template delay
delay_text
Clear
Preset OK
Radix
Base 10 (Dec)
Base 16 (Hex)
Logging
Log DA Input Loss
Log MON Input Loss
Log All Errors
Log Mon Sync Errors
Log ETR290 Errors
Log RVS Errors
Log TMP Errors
Log B/R violation
Bitrate
Minimum Threshold...
Maximum Threshold...
Bitrate (B/S)...
Bitrate (B/S)
Enable Updates
0
Min Bitrate
Max Bitrate
Min/Max Bitrate
Min/Max Bitrate
xxxxx
OK
Maximum Threshold
Maximum Threshold (b/s)
Enable
Sync Loss if 0
Minimum Threshold
Minimum Threshold (b/s)
Enable
Max/Min Threshold (b/s)
Max/Min Threshold (b/s)
0
Clear
Preset OK
Templates*
Categories…
Select templates..
Add SI template…
Delete template
Set Sequence
TMP Description
TMP Active Name
TMP Active Desc
TMP Active status
Change Template
*This menu item will only appear for the IQMDDM-T versions
Change Template
New Name
New Description
New Text
New Text
New Text
new_text
Clear
Preset OK
TMP Active Status
TMP Active Status
(tmp active status)
OK
Select Templates
Template List
Template Sequence
Add to Sequence
Remove from Seq
Up
Dn
Template Sequence
Template List
Setup
Radix…
Logging…
Bitrate…
Templates
ETR290 Except…
Memories…
Reset ETR290
Software Version…
Serial No
Restart
Serial No
Serial No
x.x.x
OK
Software Version
Version
x.x.x
OK
Memories
Save To...
Retrieve...
Default Config.
Retrieve
Mem #1
Mem #2
Mem #3
Mem #4
Mem #5
Mem #6
Mem #7
Mem #8
Save To
Mem #1
Mem #2
Mem #3
Mem #4
Mem #5
Mem #6
Mem #7
Mem #8
ETR290 Except
Ex. List…
Add PID…
Delete Exception
Unref PID Exclude
PID Err Exclude
Use Custom Time
Time
Time
Time
newexcepttime
Clear
Preset OK
Delete Exception
Delete Exception
deleteexception
Clear
Preset OK
Add PID
Add PID
newexceptentry
Clear
Preset OK
Except List
TMP Active Desc
TMP Active Desc
(tmp active desc)
OK
TMP Active Name
TMP Active Name
(tmp active name)
OK
TMP Description
TMP Description
(tmp description)
OK
SI
Programs... PMTs...
TS ID PCR PID...
Options...
Options
Show Service Names
Programme Numbers
Transport Stream ID
TS ID
(transport_stream_id)
OK
Programs
service_descriptor
service_descriptor
service_descriptor
service_descriptor
service_descriptor
service_descriptor
service_descriptor
service_descriptor
Menu depends on the format selected in the Options menu
Programs
program_number->PMT PID
program_number->PMT PID
program_number->PMT PID
program_number->PMT PID
program_number->PMT PID
program_number->PMT PID
program_number->PMT PID
program_number->PMT PID
Program Clock Reference
PCR PID
(pcr PID)
OK
Programs List
PID Component type
PID Component type
PID Component type
PID Component type
PID Component type
PID Component type
PID Component type
PID Component type
PID Component type
Inputs
I/P (D/A)…
I/P (Mon)…
Input 1…
Input 2…
Input 1/2
New Input Name...
Input Status...
Input Status
Input Status
(input1/2_status)
OK
New Input Name
New Input Name
new_input1/2_text
Clear
Preset OK
I/P (Mon)
Input 1 (Input 1)
Input 2 (Input 2)
GPI I/P 1 Level
GPI I/P 1 Level Onc
GPI I/P 2 Level
GPI I/P 2 Level Onc
Auto Select
Auto (Car/Sync/BR)
Monitor Status...
Monitor Status
Monitor Status
(mon_selected)
OK
I/P (D/A)
Input 1 (Input 1)
Input 2 (Input 2)
GPI I/P 1 Level
GPI I/P 1 Level Onc
GPI I/P 2 Level
GPI I/P 2 Level Onc
Auto Select
Auto (Car/Sync/BR)
Input Status
Input Status
Input Status
(input_selected)
OK
IQMDDM
Menu System

Operation from an Active Control Panel

MENU DETAILS
(see IQMDDM Menu System on previous page)

Main Menu

The main or top level menu allows various sub-menus to be selected by pressing the button adjacent to the required text line.



Note that where a menu item is followed by three dots (...) this indicates that a further sub-menu may be selected.

Whenever a menu item is selected the parameters of that selection will be displayed in the Information window of the front panel. Where the selection is purely a mode selection and does not enable a sub-menu, the text will become reversed (white-on-black) indicating that the mode is active. If the mode is not available for selection the text will remain normal.

Errors…

The errors menu has a list of the categories of error which can be displayed in the information window.

The categories are:

◄ All Errors

This is the logical OR of all the other categories

◄ Sync Errors

This error is activated if there is a transport stream sync loss on the monitored input

◄ ETR290 Errors

This error occurs if any of the ETR290 parameters monitored fails. The error counter will only increment if the particular ETR290 error is

◄ RVS Errors

Receive Violation Signal. This error occurs when illegal characters are detected on the input stream, which means that the 10B/8B conversion cannot be done correctly

◄ Input Loss Errors

This error occurs if the data carrier disappears on the input being re-clocked and routed to the distribution amplifier outputs.

◄ TMP Errors

This error occurs if the input being monitored does not match up with one of the templates in the sequence set

N.B. This category will only be active if the template matching option has been enabled on the module.

Each category has a sub menu with 3 options

Errors Status

This sub-menu shows the current status of the category of error – either OK or FAIL

◄ Show Stats

Selecting this option causes the status and error count of this category of error to be displayed in the information window as part of the continuously changing carousel of all displayed errors

◄ Reset Stats

Selecting this option causes the error count of this category of error to be reset to zero.

GPI…

These menus allow the user to configure the module's 2 General Purpose Interface ports for control or reporting (only with -2 option).

GPI → GPI 1 Mode (-2 option only)

◄ Off
This will inactivate the port and configure it to a high impedance state.

◄ Output
This will configure the port as an output, the state of which will reflect the state of any of the reporting parameters that have been enabled for it.
(see GPI 1 Output Menu)

◄ Input
This will configure the port as an input, the state of which will determine which of the two signal inputs will be reclocked and copied to the distribution amplifier outputs

◄ Invert GPI 1 Output
If this option is *not* selected then GPI 1 will give a **LOW** output with no error and a **HIGH** output when an error occurs.
Selecting the option will give the opposite behaviour

◄ Invert GPI 1 Input
If this option is *not* selected then a **CLOSED** contact across the GPI port will cause Input 2 to be routed to the outputs and an **OPEN** contact will select Input 1.
Selecting the option will give the opposite behaviour

GPI → GPI 1 Mode → GPI 1 Input Status (-2 option)

Displays whether an open or closed contact is currently detected across port GPI 1.
This shows either OPEN or CLOSED.
This display is only valid if GPI 1 is configured as INPUT or OFF.

GPI → GPI 1 Output (-2 option)

This menu determines which error conditions will trigger a change in state of port GPI 1 when it is configured as an output. Any number of the errors may be selected and the state of the port will be a logical OR of all the errors enabled.
The categories are:
◄ Input 1 Fail
Loss of signal on input 1

◄ Input 2 Fail
Loss of signal on input 1

◄ Either Input Fail
Loss of signal on input 1 or input 2

◄ Sync Loss
Failure to detect a transport stream sync byte on the input currently being monitored for 2 or more contiguous transport stream packets.

◄ ETR290 Error
An error on any of the ETR290 parameters currently enabled on the input currently being monitored.

GPI → GPI 2 Mode (-2 option)

Options are as for GPI 1 Mode

GPI → GPI 2 Output (-2 option)

Options are as for GPI 1 Output

Setup…

Setup → Radix

Change the Radix (base) used to display parameters from the transport stream such as PIDs and the Transport Stream ID.

◄ Base 10 (Dec)
Select Base 10 (Decimal)
◄ Base 16 (Hex)
Select Base 16 (Hexadecimal).

Setup → Logging

Selecting the Logging submenu will display a list of all the error categories. Any number of these may be selected to enable the generation of log messages from the corresponding error events

NOTE: This option will only appear if the template Matching option has been enabled.

Setup → Template Matching

NOTE: This menu will only appear for the IQMDDM-T versions

Text for Template matching operation to be added

Setup → ETR290 Exceptions

This menu controls the user definable exceptions to the ETR290 checking

Setup → ERT290 Exceptions → Exception List

This menu displays a list of the exceptions currently set.

Setup → ETR290 Exceptions → Add PID

The PID to be entered in the exception list is entered here. Turning the knob on the control panel will scroll through the characters and pressing the upper right hand button will select that character and move on to the next character position.
◄ Clear
This will clear any string entered.

◄ Preset
This will also clear any string entered.

Setup → ETR290 Exceptions → Delete Exception

The PID to be deleted from the exception list is entered here. Turning the knob on the control panel will scroll through the characters and pressing the upper right hand button will select that character and move on to the next character position.
◄ Clear
This will clear any string entered.

◄ Preset
This will also clear any string entered.

Setup →ETR290Exceptions→Unref PID Exclude

This option disables the checking of ETR290 test 3.4 (Unreferenced PID) on the PID. This option is useful in preventing errors being generated when extra data is present in the stream, but not specified in a DVB SI table.

Setup →ETR290Exceptions→ PID Error Exclude

This option allows a user defined timeout to be used when testing ETR290 test 1.6 (PID Error) on a PID in the selection list.
This option is useful to prevent errors being generated on very low-bitrate or discontinuous services.

Setup →ETR290Exceptions→ Use Custom Time

Selecting this option enables the use of a user-specified time

Setup →ETR290Exceptions→ Time

A user-defined time for the PID Error test is inserted here. Turning the knob on the control panel will scroll through the characters and pressing the upper right hand button will select that character and move on to the next character position.

The time is specified in ms, with a maximum value of 30,000 (30 seconds).

Setup → Memories

This memory allows the user to save and retrieve the configuration of the module from one of 8 configuration memories.

Setup → Memories → Save To

This menu displays a list of the 8 locally stored configuration memories. Selecting one of these causes the current state of all the control parameters of the module to be saved to that configuration memory.

N.B. saving to one of the configuration memories will cause any parameter settings stored in that memory to be lost.

Setup → Memories → Retrieve

This menu displays a list of the 8 locally stored configuration memories. Selecting one of these causes all of the control parameters of the module to be set from the selected memory.

N.B. Loading from one of the configuration memories will cause all of the current parameter settings to be lost.

Setup → Memories → Default Config

This option restores the factory default configuration to the unit. Contents of the memories not changed.

N.B. Restoring the default configuration will cause all of the current parameter settings to be lost.

Setup → Reset ETR290

Selecting this option will force the module to reacquire all PSI/SI information and retest the ETR290 parameters

Setup → Software Version

Displays the version number of the software loaded on the module.

Setup → Serial No

This menu displays the serial number of the unit.

Setup → Restart

This menu allows the unit to be reset remotely.

N.B: Restarting the unit wilt take a few seconds and will result in an interruption to the distribution amplifier outputs.

SI…

These menus allow the user to view the Programs and components present in the transport stream currently being monitored.

SI → Programs

Displays the list of programs (services) present in the stream as listed in the PAT. The format of the list is determined by the **SI → Options** menu.
One of the programs may be selected for display in the **SI → PMTs** menu

SI → TS ID

Displays the transport stream ID extracted from the Program Association Table (PAT).

SI → Options

These options determine how the list of programs in the transport stream is displayed in the programs list menu.

◄ Show Service Names
Each program in the PAT is identified by its name extracted from the Service Descriptor Table (SDT).

◄ Program Numbers
Each program in the transport stream currently being monitored is identified by its program_ number and the PID where the Program Map Table (PMT) for that program can be found.

SI → PMTs

Displays the list of components which constitute the program selected in the **SI → Programs** menu. Each component is identified by the PID of the packets which carry it and the type of component e.g. video, audio, data, etc.

SI → PCR PID

This menu displays the PID on which the PCR (Programme Clock Regerence) is transmitted for the selected programme.

Inputs…

This menu controls the source for both the distribution amplifier outputs and the transport stream monitor. It also allows the user to assign ASCII labels to the input signals

Inputs →Input (Distribution Amp)

◄ Auto Select
Causes the distribution amplifier outputs to be a reclocked copy of the signal at any input where a signal has been detected. If both or neither input has a signal then the selected input is not changed.

◄ Input 1
Forces the distribution amplifier outputs to be a reclocked copy of the signal at input 1.

◄ Input 2
Forces the distribution amplifier outputs to be a reclocked copy of the signal at input 2.

◄ GPI I/P 1 Level (-2 option)
Selects between input 1 and input 2 according to the status of GPI port 1.
N.B. This option will only be selectable if GPI 1 is configured as an input.

◄ GPI I/P 2 Level (-2 option)
Selects between input 1 and input 2 according to the status of GPI port 2.

◄ GPI I/P 1/2 Level Onc (-2 option)
When selected, the routing of the input signals will be controlled by the level of the GPI port, provided that the GPI port is configured as an input (see **GPI Menu**). However, once the GPI has triggered an input change (switch from Input 1 to Input 2 or vice-versa), the unit will stop switching inputs until RollCall is used to change the input select back to GPI Input (Level Once).

◄ Auto Select
When selected, this will remain with the current input if there is a valid signal on it. If there is not, or the signal disappears, the module will switch to the other input, providing that there is a valid signal on that input. If there is no valid signal on either input then the module will revert to input 1.

◄ Auto (Car/Sync/BF
When selected, this will remain with the current input if there is a valid signal on it. The module will switch to the other input if at least one of the following conditions is true:

- No valid signal on the current Input
- TS sync loss on the Monitor Input
- Minimum Bitrate violation (if enabled) on the monitor Input

NB: If the DA Input is set to Auto (Car/Sync/BR), and the monitor input is not set to Auto (Car/Sync/BR), the DA Input will oscillate if carrier is present on both inputs, and there is a fault condition (sync loss or bitrate violation) on the monitor input.

◄ **Input Status**
Displays which input is currently being reclocked and copied to the distribution amplifier outputs.

Inputs → Input (Monitor)

Options are as for the Input (D/A) menu

Inputs → Input 1 → Monitor Status

Displays which input is currently being fed into the transport stream monitor.

Inputs → Input 1

Inputs → Input 1 →New Input Name

◄ Input
The ASCII label to be assigned to the signal at input 1 is entered here. Turning the knob on the control panel will scroll through the characters and pressing the upper right hand button will select that character and move on to the next character position.
◄ Clear
This will clear any string entered.
◄ Preset

This will also clear any string entered.

Glossary

ASI	Asynchronous Serial Interface
BR	Bitrate
CAR	Carrier
CBR	Constant Bitrate
Continuity Count	4 bit counter incrementing (with exceptions) for each TS packet of the same PID
CRC	Cyclic Redundancy Checksum
DVB-ASI	Digital Video Broadcasting Asynchronous Serial Interface
ES	Elementary Stream. A bit stream that includes video, audio or data representing the preliminary stage to the Packetized Elementary Stream (PES)
ETR 290	Measurement guidelines for DVB systems
GOP	Group of Pictures
GPI	General Purpose Interface
MPEG2	Motion Picture Experts Group standard for encoding video signals
PAR	Picture Appraisal Rating
PAT	Program Association Table. Lists all the programs contained in the transport stream and shows the PID value for the PMT associated with each program. It is always found on PID 0x0000
PCR	Programme Clock Reference. A time stamp in the transport stream the sets the timing of the decoder. This is transmitted at least every 100 ms
PES	Packetized Elementary Stream
PID	Packet Identifier. This unique integer value identified elements in the transport stream such as tables, data, or the audio for a specific program.
PMT	Program Map Table. This table specifies PID values for components of programs and also references the packets that contain the PCR.
PSI/SI	Program specific information/System information. Commonly used as synonym for ATSC/MPEG tables
RST	Running Status Table
RVS	Receive Violation Signal. This error occurs when illegal characters are detected on the input stream
SDT	Service Descriptor Table. This describes the characteristics of available services and is located on PID 0x0011.
Service	A collection of one or more events under the control of a single broadcaster; also known as Program.
Service ID	Program Number A 16-bit number uniquely identifying each service (program) in the transport stream.
Template Matching	Identifying Transport streams by taking a “fingerprint” of unique properties
TR101290	Revised version of ETR290
TS	Transport Stream

Manual Revision Record

Date	Version No.	Issue No.	Change	Comments
050601	1	1		First Issue
160402	1	2	Now includes information for the 3A enclosure modules	New manual issued
150403	1	3	Power consumption added to techspec	New manual issued
250805	1	4	New GPI mode added & TOC	New manual issued