



# AS-01



**Users Manual**



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## 1. General Description

The AS/01 is a very useful accessory which is part of Elber's products line for the transport of digital TV signal.

It's a switch which accepts up to three ASI inputs (A, B, C) and enables at the output the stream that respects the conditions set in the configuration menu.

It's possible to set some parameters which can univocally identify the stream:

1. Two PID (*Program Identifier*) to be searched between the programs present in the input ASI stream;
2. A combination logic of the two PID (OR, AND, UP TO, NAND);
3. A time interval between 0.1 and 1.5 seconds during which the presence or the absence of selected PIDs is verified in the input stream.

Moreover, two different modality of the equipment can be selected:

- The **Auto** modality gives the highest priority to the input A; if this one falls or doesn't respect the parameters set by the user, the stream present at input B is enabled at the output; if this one also is absent or is not recognized positively, stream C is selected. If a stream with higher priority turns valid, a new switch is performed.
- The **Forced** modality let the user to select at the output always the same stream, independently from the respect of configuration parameters.

The programming of the functionality and the monitoring of the parameters of the ASI switch can be performed, as well as through keypad and LCD display present on the front panel, through an RS-485 or SNMP interface.



## 2. Technical Specifications

### 2.1 Generals.

<b>Input connectors</b>	BNC female 75 Ohm
<b>Output connectors</b>	BNC female 75 Ohm
<b>Remote control interface</b>	RS-485, SNMP
<b>Power Consumption</b>	10 W
<b>Power Supply</b>	A.C. 115V $\pm$ 10 % - 230V 10 % DC 22V - 65 V galvanically isolated

### 2.2 Mechanicals.

<b>Width</b>	482 mm (Standard 19")
<b>Height</b>	44 mm (1U)
<b>Depth</b>	480 mm
<b>Weight</b>	4 kg

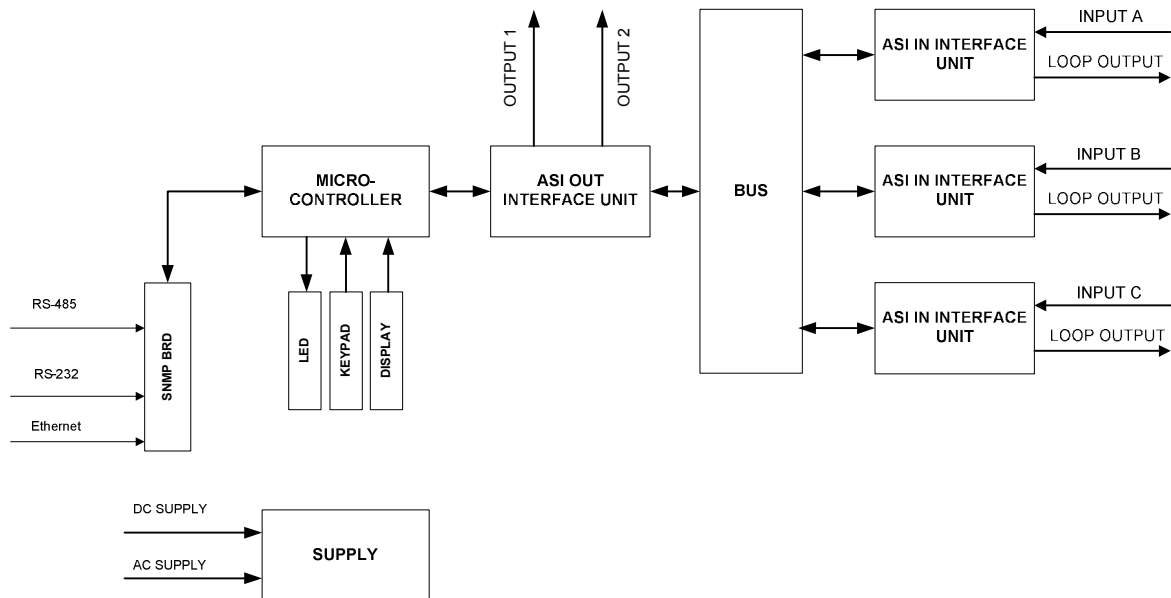


### 3. Installation.

1. Open the package box. Using a cutting tool be careful not to damage the content of the package content.
2. The box should contain:
  - a. The ASI switch AS/01
  - b. One AC power cord
  - c. One DC power cord with connector at one end
  - d. The User Manual
3. Install the AS-01 in a cabinet rack. The space required is 1 rack unit. Verify that:
  - a. There is sufficient clearance on both sides of the equipment in order not to restrict air flow.
  - b. The air flowing through the apparatus must be dry and dust free.
  - c. No heat sources should be placed too close to the equipment: the proper functioning is warranted for ambient temperature between -5°C to +60°C.
4. Install the power cord and connect to the primary power source.
5. Make the ground connection to the screw located on the rear of the apparatus, to meet the EMC directives.
6. Be sure of right voltage reading carefully the data in the manual or on the sticker placed on every apparatus (containing the serial number)
7. Connect the ASI input streams through the BNC 75  $\Omega$  connector in the back panel.
8. Switch on the equipment through the switch in the back panel.
9. The status and the configuration of the device can be controlled locally (through keypad and display) following the instructions written in chapter 4.6 relative to the user interface.

## 4. Theory of operations

This chapter deals with the functioning of the ASI switch and of every single board.. The following block diagram shows the physical and logical structure of the system.



**Figure 1: AS-01 block diagram.**

The AS-01 ASI Switch receives up to three ASI input (A, B, C) forwarding at the output the stream which respect the pre-selected configuration menu conditions.

If more signals satisfy the conditions and the AUTO-mode is selected, the stream having the highest priority is sent at the output; the default priority streams is A-B-C. If, for example, the input A signal break-down, the equipment switches the output on the B stream; as soon as the A stream returns available, a new commutation happens in order to respect the priority order.

It is possible to set up some parameters that identify unequivocally the stream at the input. These parameters are 2 PID (*Program Identifier*), to be searched between the programs present in the ASI input stream, and the logical combination of the 2 PID (OR, AND, UP TO, NAND).

For example, if the 250 and 1200 PIDs are selected through user interface and the logical combination chosen is AND, so the input stream has to contain both the PIDs in order to be considered valid.



Else if the logical operator chosen is OR, it is sufficient that only one of two PIDs is present in the stream.

In case of NOT operator selection, the input stream has to contain only the 250 PID in order to be considered valid and the 1200 PID must be absent; it's very useful to identify a specific DVB-T bouquet.

The last logical combination available is TO; it is sufficient, to be consider valid the signal, that one PID in the range between 250-1200 is present in the stream.

This option is useful when the input ASI stream transports low bit-rate signals.

In this situation the maximum interval time selectable (1.5 seconds), during which the presence or lack in the input stream of the selected parameters is verified, is not sufficient because of the asynchronous nature of ASI.

Instead, enlarging the research on a greater number of PID, the equipment is able to recognize the validity of low bit-rate streams.

A further parameter selectable is the maximum time interval during which the input's validity is verified; at the end of this time, if the stream is not valid, the switching is provided.

The time interval can be chosen between 0,1 to 1.5 seconds with step of 0,1 seconds. If the time is long than the research is wide (typical situation of low bit-rate streams), but the system is slow to recognize the non-validity stream; on the contrary if the selected time is low, it is advisable to indicate the PIDs of high bit-rate streams in order to correctly recognize the validity of the stream and to prevent continuous useless switching.

Elber s.r.l. provides technical support necessary to optimize the system's performances.

Follow a description of every boards of the equipment.



## ***4.1 Microcontroller***

The controller caters for the following functions:

- Managing of user interface ( Par. 4.6).
- Managing of the switcher programming.
- Data communication with remote control interface (SNMP).

## ***4.2 ASI In Interface.***

Each of these 3 boards receives the ASI signal directly from the BNC connector, located on the rear panel, and gives back it at the output on the BNC OUT connector, after the equalization of the cable distortions.

The board also verify if the input stream respect the functional parameters of the switcher, and signals the result to the ASI OUT INTERFACE, through BUS.

The ASI OUT INTERFACE board controls if the conditions to enable the output channel are verified and eventually provides an ENABLE signal.

## ***4.3 ASI Out Interface.***

This board is the core of the equipment.

The ASI OUT INTERFACE receives from the microcontroller the data selected by the user and forwards them to the input interfaces which communicates to the board the validity of the respective ASI stream, basing on the parameters chosen by user.

On the basis of the data received by the boards (microcontroller and input interfaces), the ASI OUT INTERFACE provides the switching.

The board also communicates to the microcontroller the data monitored on the input streams.

## ***4.4 BUS.***

It provides the communications between data input and output interfaces.

## 4.5 Supply

The AS-01 ASI Switch can be powered through:

AC	230 V +/-20% 50/60Hz or AC 115 V +/-10% 50/60Hz
DC	25 ÷ 65 V galvanically isolated
Absorbed power	10 W

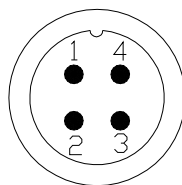
The fuse on the AC input connector/switch is rated at 1.6 A.

An automatic switch between the two sources is present: in case of failure or low voltage of the AC primary mains, the supply input will be switched to the DC supply.

The switch between the two sources is "hit-less", this means that it will not cause any interruption or effect on the transmitter/receiver performance.

The DC input connector is a 4 pin connector; the supply cable should be connected to pin 2 or 4 with no regard to polarity.

The DC input is galvanically isolated with respect to the apparatus ground.



**Figure 2 : DC supply connector**



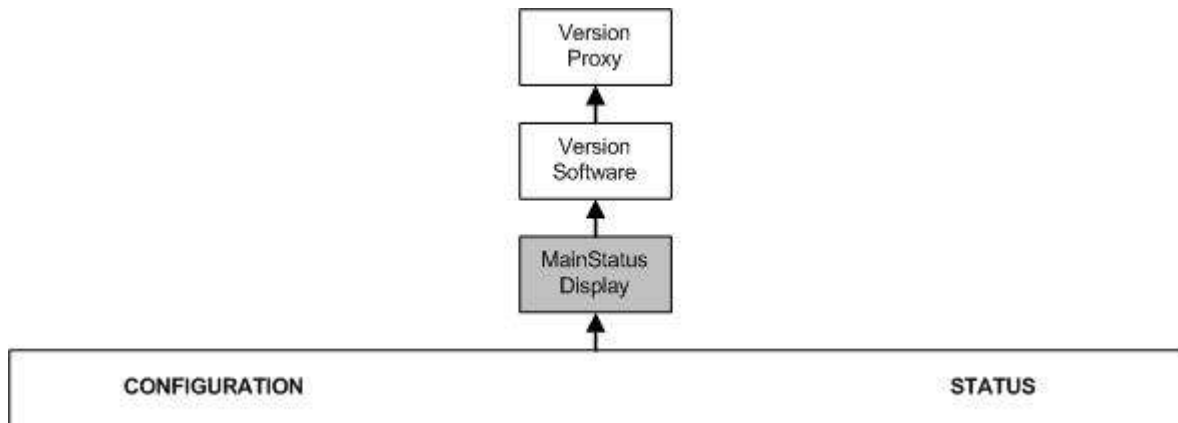
#### ***4.6 User interface (keypad + display).***

The setup, control, and monitoring is provided through the navigation in the embedded software menu presented on a 24x2 alphanumeric display and operated by a six way keypad.

The six way keypad enables navigation through the various menus of the embedded system. The function of the keypad depends on the menu position. A short description follows:

<b>Keypad</b>	<b>Configuration Menu</b>		<b>Status Menus</b>
	<i>Position 1</i>	<i>Other Position</i>	
<b>UP</b>	Previous Menu		Previous Menu
<b>DOWN</b>	Next Menu		Next Menu
<b>RIGHT</b>	Cursor scrolls one position to the right	Cursor scrolls one position to the right	No use
<b>LEFT</b>	No use	Cursor scrolls one position to the left	No use
<b>ENTER</b>	Next Menu	Saves and applies changes	Next Menu
<b>ESC</b>	Displays Main Menu	Discard any changes	Displays Main Menu

**Table 1**



**Figure 3: Menu structure**

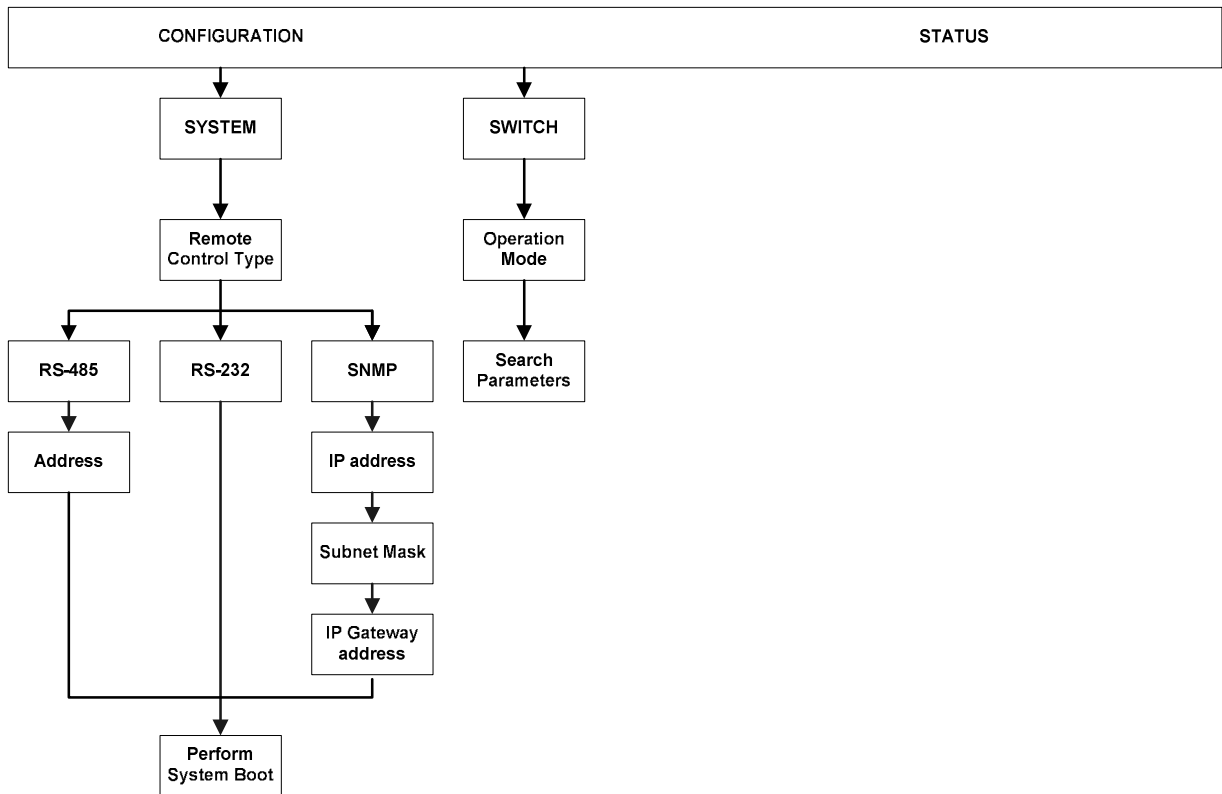
**Table 2**

<b>Option</b>	<b>Description</b>
<b>Main Status Display</b>	It visualizes the equipment status and "ALARM: PLEASE CHECK" if there are any alarms else "LOCKED".
<b>Version Software</b>	This menu is automatically displayed for 3 seconds and provides the version of the microcontroller firmware (par. 4.1) and of the ASI OUT INTERFACE (par. 4.3).
<b>Version Proxy</b>	This menu is displayed for a fixed time of three seconds, after which the display returns to the main menu. The firmware version of Proxy board is visualized.
<b>Configuration</b>	The Configuration Menu option allows to access to the System configuration parameters.  <i>Refer to Paragraph 4.6.1</i>
<b>Status</b>	The Configuration Menu option allows to access to the System status parameters.  <i>Refer to Paragraph 4.6.2</i>



### 4.6.1 Configuration menu

The Configuration Menu allows the user to modify the parameters of the device. Figure 4 shows the Configuration Menu tree structure.



**Figure 4: AS-01 configuration menu**



Table 3

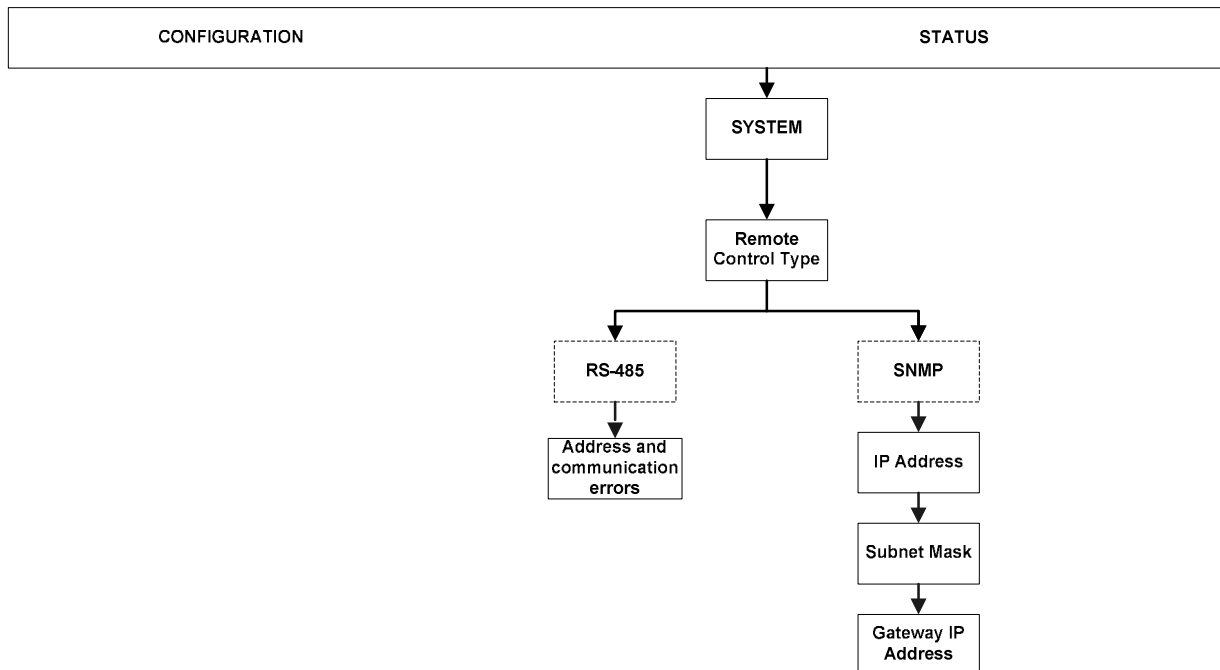
Option	Description
<b>Operation Mode</b>	The function-mode of the switcher can be select; the mode available are: AUTO, FORCED ON INPUT A, FORCED ON INPUT B, FORCED ON INPUT C.
<b>Search Parameters</b>	<p>It is possible to set up some parameters that identify unequivocally the stream at the input.</p> <p>These parameters are 2 PID (<i>Program Identifier</i>), to be searched between the programs present in the ASI input stream, the logical combination of the 2 PID (OR, AND, UP TO, NAND) and the time interval between 0,1 to 1.5 seconds during which the presence or lack in the input stream of the selected parameters is verified.</p>
<b>Remote Control Type</b>	<ul style="list-style-type: none"> <li>• RS-485</li> <li>• Ethernet/SNMP (Optional)</li> </ul>
<b>Perform System Boot</b>	System reset



## 4.6.2 Status menu

### 4.6.2.1 System

The remote control parameters selected in the configuration menu can be verified. Figure 5 shows the menu tree structure.



**Figure 5: System status menu**

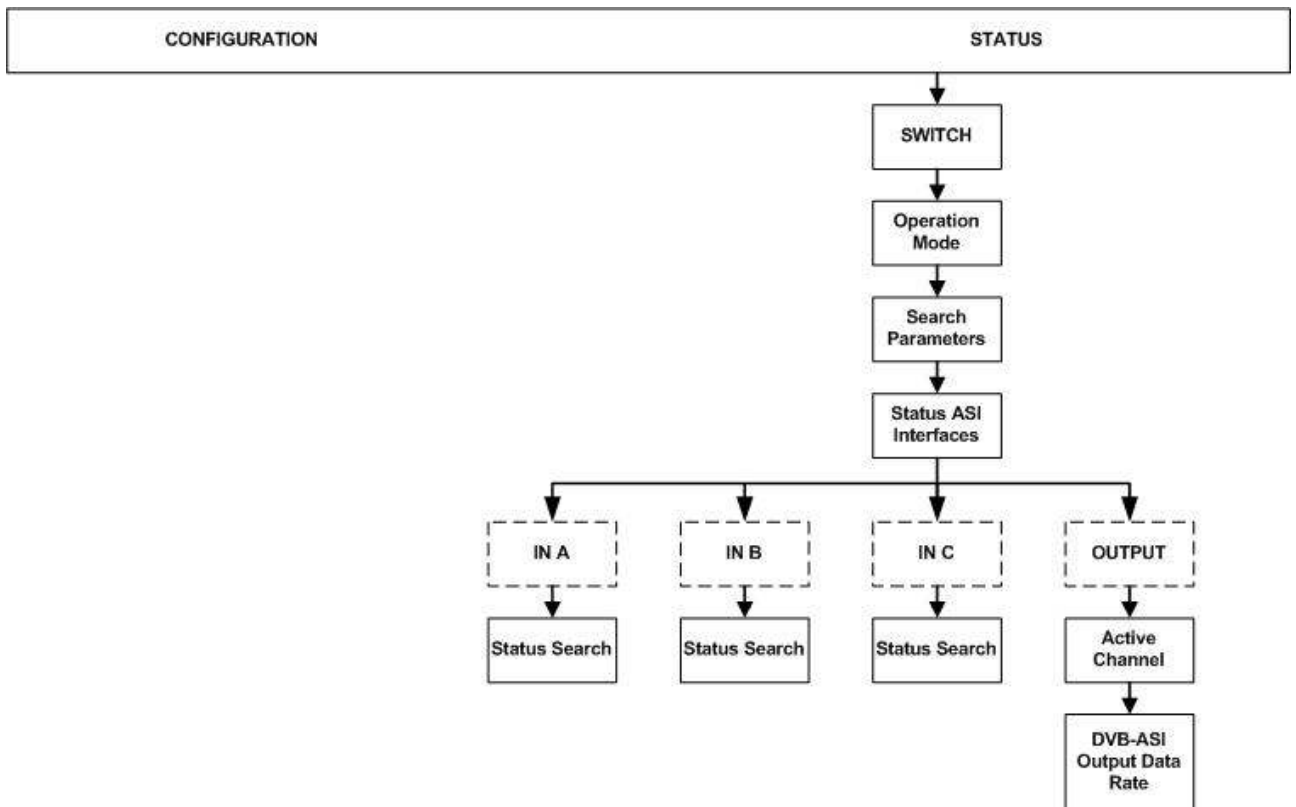
**Table 4**

<b>Option</b>	<b>Description</b>
<b>Status Remote Type Control</b>	Visualizes the remote control type
<b>Communication Errors and addresses</b>	Visualization of the RS-485 selected address Visualization of the error parity number and protocol violation
<b>IP Address</b>	Visualization of the SNMP board IP address
<b>Subnet Mask</b>	Visualization of the subnet mask
<b>Gateway IP address</b>	Visualization of the IP address of the network Gateway



### 4.6.2.2 Switcher

The Status switcher menu allows the user to verify the functioning parameters selected in the configuration menu and to read the output status.



**Figure 6: Switcher status menu**



Table 5

Option	Description
<b>Operation Mode</b>	Visualization of the function-mode (AUTO or FORCED on one of the inputs)
<b>Search Parameters</b>	Visualization of the parameters that validate unequivocally the stream at the input (PID1, PID2, logical combination of the 2 PID and research time).
<b>Status ASI Interface</b>	It visualizes the status of the output and of the 3 input signals.
<b>Status Search</b>	Status of the input parameter research <i>(Successful/Failed)</i>
<b>Active Channel</b>	Visualization of the output enabled channel
<b>DVB-ASI output data-rate</b>	Visualization of the bit-rate ASI stream enabled at the output



## 4.7 External description

### 4.7.1 Front Panel.

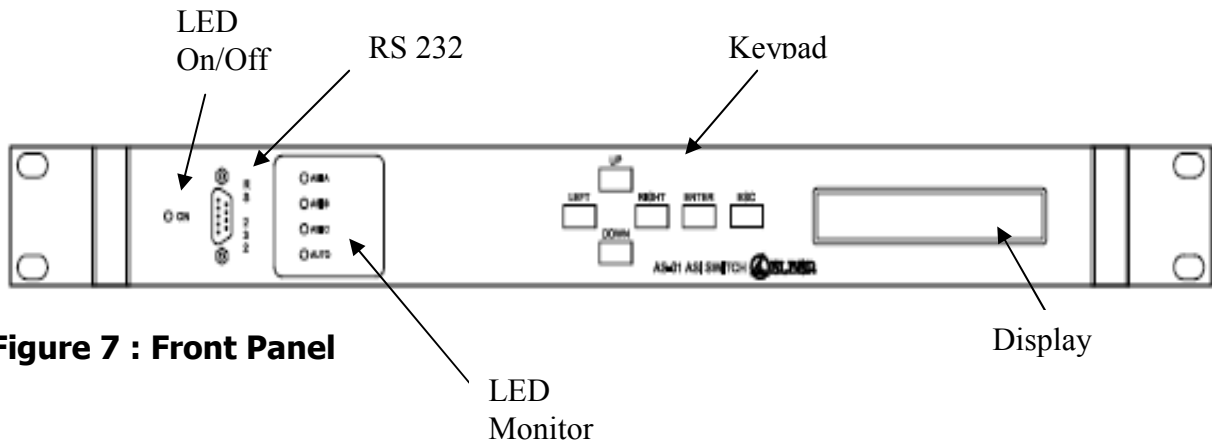


Figure 7 : Front Panel

#### 4.7.1.1 Controls and indicators

Tag	Description			
<b>LED</b>	Green: Equipment switched ON Off: Equipment switched OFF			
<b>LEDS monitor</b>	<b>LED</b>	<b>GREEN</b>	<b>FLASHING</b>	<b>RED</b>
	<b>ASI A</b>	Stream recognized on input A	Channel A enabled at the output	Stream unrecognized on input A
	<b>ASI B</b>	Stream recognized on input B	Channel B enabled at the output	Stream unrecognized on input B
	<b>ASI C</b>	Stream recognized on input C	Channel C enabled at the output	Stream unrecognized on input C



	<b>AUTO</b>	Automatic	-	Forced
<b>Six Way Keypad</b>	Keypad used to navigate through embedded software menu			
<b>LCD</b>	A 24x2 alphanumeric display			

### 4.7.1.2 Connectors description

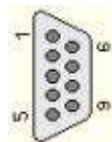
Serial communication is performed through RS232 connector. The connector is a standard DB9 having the following connections:

Pin 2: Receive

Pin 3: Transmit

Pin 5: Earth

Other pins not connected



**Figure 8 : DB9 male connector**



### 4.7.2 Back panel

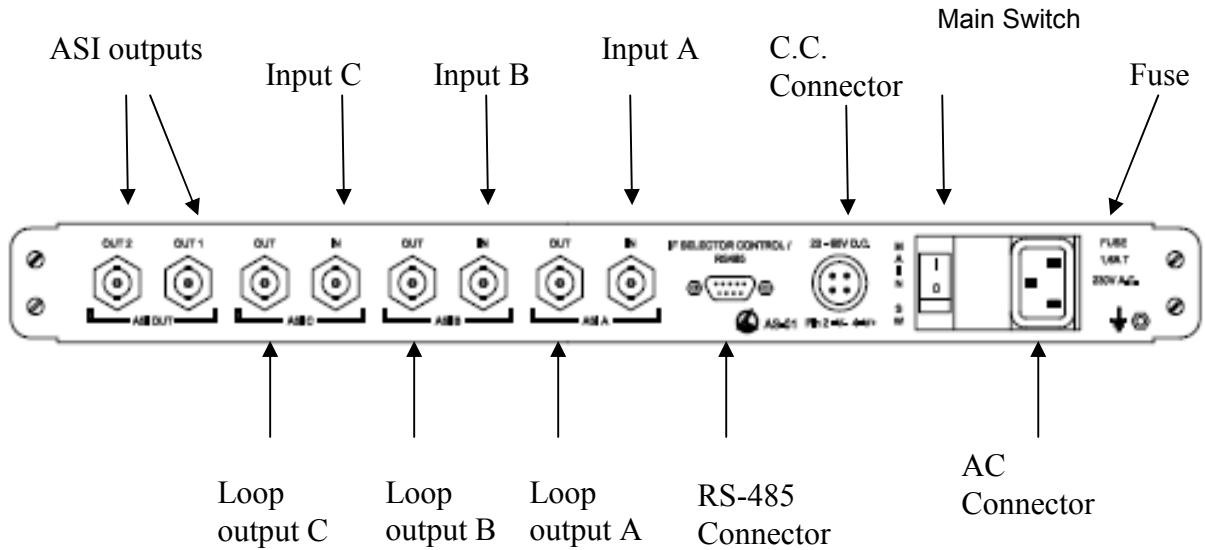


Figure 9: Back panel

#### 4.7.2.1 Connectors description

Connector	Description	
<b>Input and output connectors</b>	<b>Connector</b>	<b>Description</b>
	<b>IN A</b>	ASI input connector, type BNC
	<b>OUT</b>	Loop ASI A output connector, type BNC
	<b>IN B</b>	ASI input connector, type BNC
	<b>OUT</b>	Loop ASI B output connector, type BNC
	<b>IN C</b>	ASI input connector, type BNC
	<b>OUT</b>	Loop ASI C output connector, type BNC
	<b>OUT 1</b>	Output switcher connector, type BNC



	<b>OUT 2</b>	Output switcher connector, type BNC
<b>RS-485</b>	DB9 connector for remote control: Pin 1: A 485 Pin 2: B 485 Pin 3: +5V Pin 5: RESET Pin 8: ALARM COM Pin 9: GND	
<b>DC Connector</b>	22-65 V DC Input	
<b>Main Switch</b>	ON/OFF (apparatus)	
<b>Fuse</b>	230V 1.6A	
<b>AC Connector</b>	230V 50/60 Hz	



## 5. System configuration

At any time (always using the keypad/display interface) the following parameters can be changed:

- Function-mode
  - AUTO
  - FORCED ON INPUT A
  - FORCED ON INPUT B
  - FORCED ON INPUT C
- Parameters that validate unequivocally the stream at the input
  - PID 1 (*Program IDentifier 1*)
  - PID 2 (*Program IDentifier 2*)
  - logical combination of the 2 PID
  - Research time
- Remote control type
  - RS-485
  - Ethernet/SNMP (optional)



## 6. Monitor

### 6.1 Alarm description

The presence of alarms is indicated by red LEDs on the front panel.

Descriptions as follow:

**ASI A** : ASI stream on input A is not present or doesn't respect the switcher configuration parameters.

**ASI B** : ASI stream on input B is not present or doesn't respect the switcher configuration parameters.

**ASI C** : ASI stream on input C is not present or doesn't respect the switcher configuration parameters.

**AUTO** : The switcher is not enable; at the output is forcedly presented the input selected in the configuration menu (corresponding to the flashing led).

### 6.2 Monitor description

The monitoring of the main functional parameters can be made through the local interface (keypad and display on the front panel).

The acquired values concern:

1. Function-mode (Available also on RS-485)
2. Selected parameters that validate unequivocally the stream at the input
3. ASI interfaces status
  - a. It indicates, on the input interfaces, if the parameters research succeeded
  - b. On the output interfaces it indicates which input is active and the data-rate (Mb/s) (Available also on RS-485)
4. Remote control type selected



5. Configuration parameters of the remote control

## **7. Programming**

Firmware upgrade may concern the microcontroller or one of the four ASI interface boards (three input and one output interface).

If the upgrade involves only the microcontroller, it isn't necessary to open the equipment, removing the cover an RS-232 cable modified in order to have GND on pin 9 should be used.

For further information please contact the manufacturer.

If the upgrade involves the ASI interfaces, it will be necessary to open the cover of the equipment.

The manufacturer will temporarily supply the programmer, the new firmware and the software to upload it in case the customer want to make the upgrade in his main office or on site; on the contrary the operation will be done at Elber's main office in a maximum time of one week plus transport time.

The firmware upgrade is free in the term of warranty agreed at purchase.