



IQBCO Changeover Switch

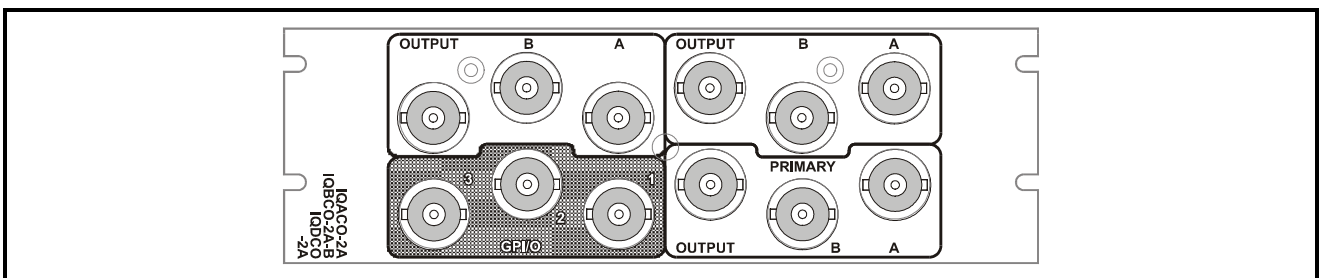
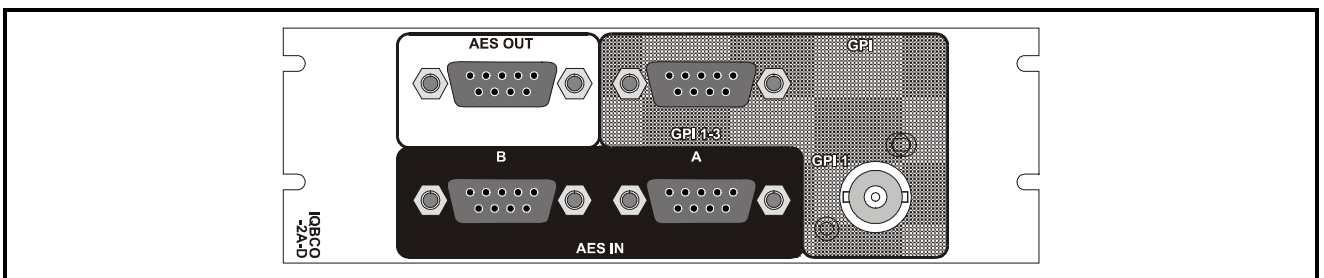
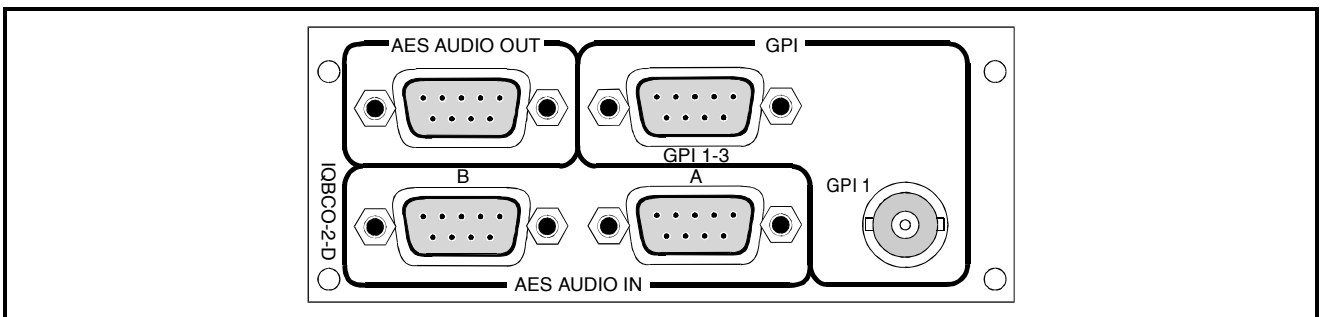
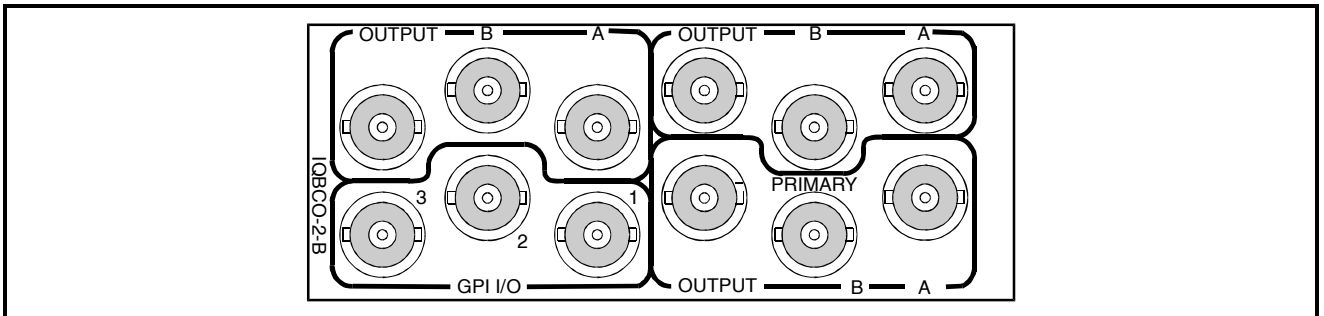
Module Description

The IQBCO is a passive changeover switch with AES audio presence detection. Both inputs are monitored for signal presence and channel status. The condition for switch over may be programmed to be signal loss or a change in channel status. Balanced (-D) and unbalanced (-B) versions are available. Both units include three GPI/O's that provide additional trigger inputs or tally outputs. In event of power loss input A is automatically selected. For additional security the relay switch is mounted in

the rear panel assembly thus enabling the module to be removed from the chassis without breaking the connectivity of input A to output.

RollCall remote and card edge controls are available. All fault or warning conditions can be reported and logged over RollCall.

REAR PANEL VIEWS



Operational Overview

The IQBCO offers great flexibility in determining the conditions that can cause the switch to change from A to B and B to A. These conditions are set using a sequence of 5 RollCall programmable rules. Each rule is evaluated in turn with rule 1 taking the highest priority. If the rule is evaluated as true then the selected action will take place – the actions available are to select input A or select input B.

All of the rules are based on a definition of whether one of the inputs is either 'OK' or 'Error'. The default definition of 'OK' is simply that the input is present, though it is possible to qualify this definition with other tests such as for a particular line standard, embedded audio presence or valid EDH. 'Error' is automatically defined as the converse of 'OK'.

Having chosen a definition of 'OK' the sequence of rules can now be programmed. Each rule of the 5 available may be programmed to one of many conditions such as 'A_is_OK', 'B_in_Error', 'GPI_1_Closed', etc. Remember that each rule has only one action so it is necessary to set at least two rules to toggle the switch. It is also important to understand the difference between testing for 'OK' and testing for 'Error'. In dual redundant installations where signals on A and B inputs are of equal priority it would be normal to test for the 'Error' condition so avoiding unnecessary switches when a previously failed input returns to good. However where the switch is used to enable a backup source it would be normal to test for the 'OK' condition on the main input.

Example:

To set up a simple changeover function based on the following two rules - if A is present select input A and if A is not present select B – requires 'Rule_1' to be set to 'Select_A' if 'A_is_OK', and 'Rule_2' to be set to 'Select_B' if 'A_in_error'. In this example the unit will not check whether input B is present before switching over; if such a check is required then change 'Rule_2' to 'Select_B' if 'B_is_OK'.

The rules also permit actions based on the state of the external GPI's. If, say a closed contact on GPI_1 is required to override any signal detection process set 'Rule_1' to 'Select_B' if 'GPI_1_Closed'. If signal detection as in the above example is required to have higher priority than GPI sensing then apply the GPI test under 'Rule_3'.

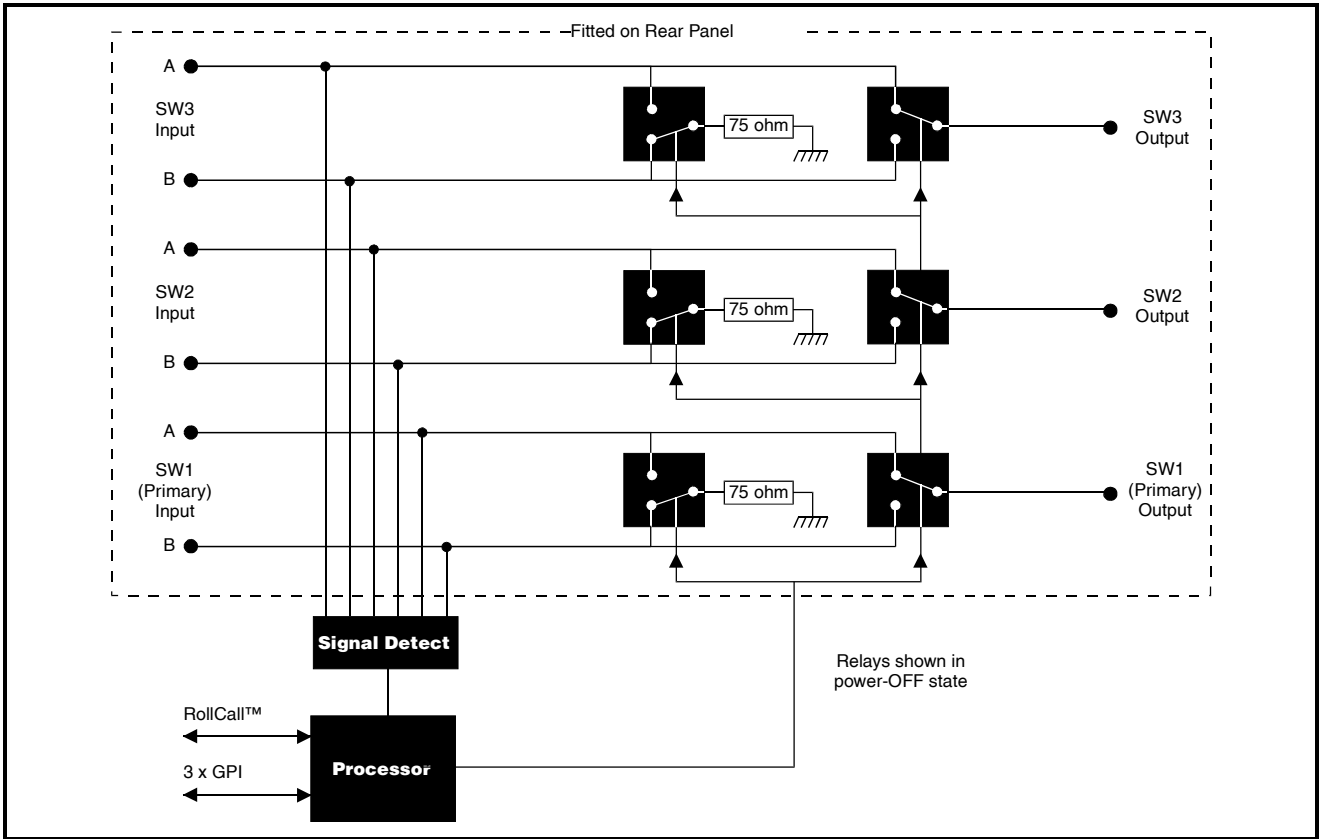
Under each rule it is possible to set a time delay. This is the length of time that the rule must be evaluated as true for before activating the action. If the rule is evaluated as false before the set time expires the action will be prevented and the time reset.

Any of the three GPI ports may be set as tally outputs and the condition under which the output is active (closed contact) is fully programmable. For added flexibility it is possible to set a different definition of 'OK' for the tally than that used for rule checking. It is therefore possible, for example to tally EDH errors without causing a switch over.

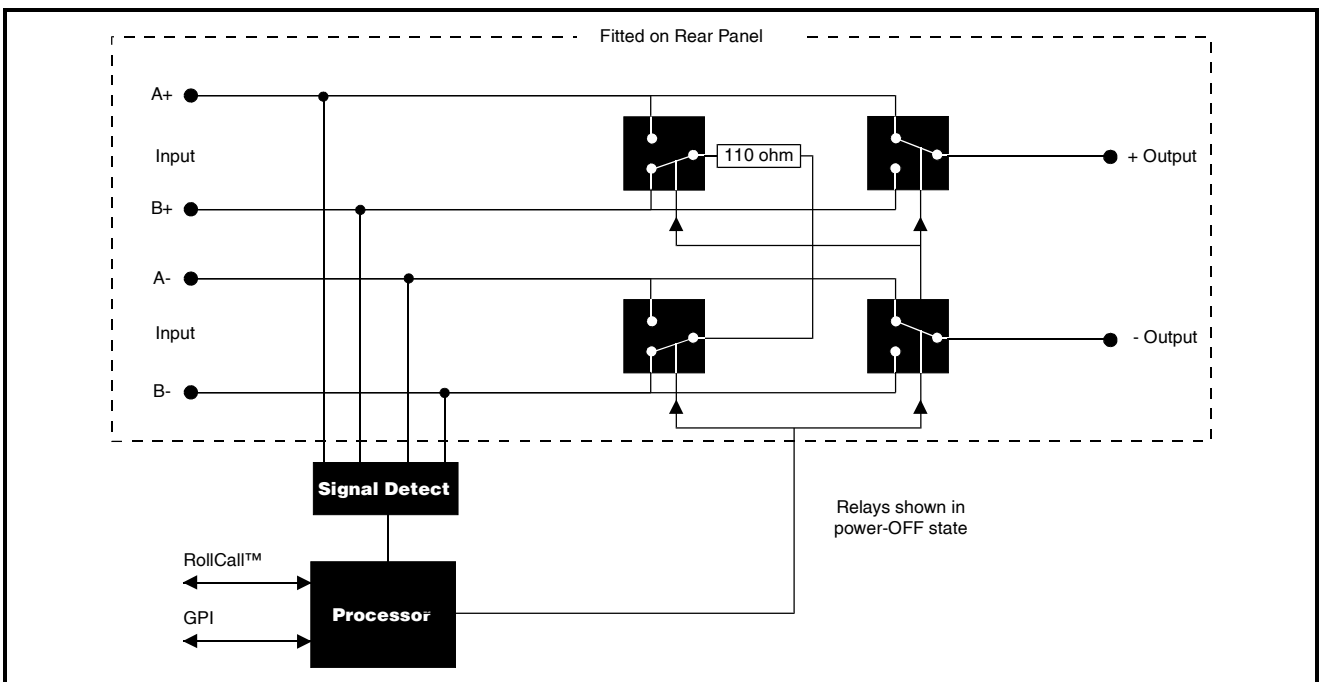
The default or factory rule setting is for the backup switch example; thus 'Rule_1' is set to 'Select_A' if 'A_is_OK' and 'Rule_2' is set to 'Select_B' if 'B_is_OK'. Rules 3 to 5 are switched 'Off'. The default setting for the GPI's is for GPI 1 to tally the switch state (closed contact = input B selected) with GPI 2 and GPI 3 set to tally the presence of signal on input A and input B respectively (closed contact = 'A/B_is_OK'). It is possible to return to the factory settings by using the 'Preset_Unit' control.

BLOCK DIAGRAMS

IQBCO-2-B



IQBCO-2-D



Features

- Passive unbalanced AES audio changeover switch (-B)
- Passive balanced AES audio changeover switch (-D)
- Automatic switch over on programmable condition(s)
- Three programmable GPI/O's for control or tally
- Programmable switch over time delay
- Continuity (A input) maintained with power loss or module removal
- RollCall remote and card edge control
- RollCall fault logging

Versions of the module cards available are:

IQDCO-2	IQDCO SDI Changeover	Double width module
IQACO-2	IQACO Video Changeover	Double width module
IQBCO-2-B	IQBCO AES/EBU audio changeover. Unbalanced.	Double width module
IQBCO-2-D	IQBCO AES/EBU audio changeover. Balanced.	Double width module

Features

Signal Inputs

Digital Audio Input (Balanced –D versions)
 2 per channel (1 channel)
 AES/EBU
 via 2x9 way D Connector

Digital Audio Input (Unbalanced –B versions)
 2 per channel (3 channels)
 AES/EBU
 via BNC Connectors

Standards AES3–1992

Signal Outputs (Passive)

Digital Audio (Balanced –D versions)
 1 per channel (1 channel)
 AES/EBU
 via 1x9 way D Connector

Digital Audio (Unbalanced –B versions)
 1 per channel (3 channels)
 AES/EBU
 via BNC Connectors

Standards AES3–1992

Specifications

Primary Inputs & Outputs: (-B)
 Return Loss (output terminated)
 <-25 dB @ 6 MHz

Return Loss (input terminated)
 <-25 dB @ 6 MHz

Maximum cable length (input + output)
 >500 metres

Secondary Input & Outputs (-B)
 Return Loss < -38 dB @ 5 MHz
 Crosstalk..... < -30 dB up to 100 MHz

Performance Information

Standards EN55103-1:1996 (Environment E2)
 EN55103-2:1996 (Environment E2)
 FCC Part 15, Class A (Verification)

Inrush Current Please refer to IQ Modular Box manual

Performance Degradation: None.

GPI I/O..... 3 x closing contact via BNC/9 way D Connector

Card Edge Controls (also available via RollCall)

Switch mode Manual / Auto (Audio Loss only)
 Manual switch A / B
 Local Selects default mode (cancels any RollCall programmed conditions)

Indicators

Power O.K.
 Input Loss A
 Input Loss B

Functions Available via RollCall Only

Switch condition Any logical combination of warnings and GPI triggers

GPI/O program..... Tally any input state or warning or set as trigger

Switch delay..... 0 to 10 s from trigger condition(s)

Reporting & Logging Input Loss; Channel Status Monitoring

Primary Inputs & Outputs: (-D)
 Maximum cable length (input + output)
 >180 meters

Power Consumption

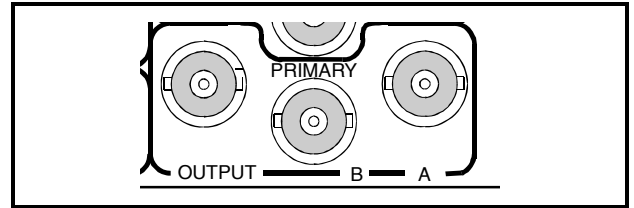
Module Power Consumption
 1.4 W max (balanced version)
 1.7 W max (unbalanced version)

GPI I/O Characteristics Closing Contact Type
 Output Sink Current 100 mA
 Input Source Current 1 mA typical
 Input Threshold Voltage 1 V typical

INPUTS AND OUTPUTS (Unbalanced -B versions)

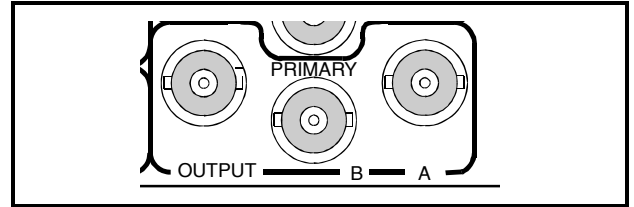
AES Inputs (A and B)

These are the two AES audio inputs for each of the three channels via BNC connectors that terminate in 75 Ohms.



AES Outputs (OUT)

These are the AES audio outputs for each of the three channels via BNC connectors for 75 Ohms.



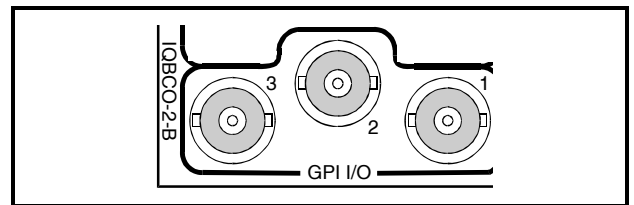
Note:

If the Primary output is not terminated correctly by 75 Ohms, the output may alternately select between input A and B until correctly terminated.

To overcome this, in some systems it is possible to insert an in-line 75 Ohm termination at the receiving equipment input. This will have a detrimental effect on the stated receive distance i.e. will be reduced. An absolute figure is difficult to specify due to system configuration, cable type and connector type etc.

GPI I/O

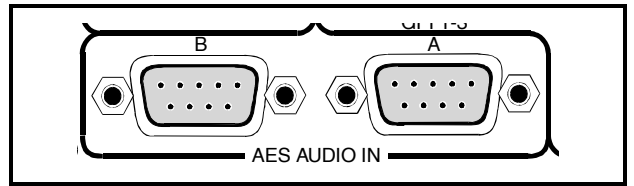
These three GPI connectors may be configured independently as inputs or outputs.



INPUTS AND OUTPUTS (Balanced -D versions)

AES Inputs (A and B INPUTS)

The two balanced AES audio inputs are made via these 9-way D connectors.



AES Outputs (OUTPUT)

The balanced AES audio output is available via this 9-way D connector.

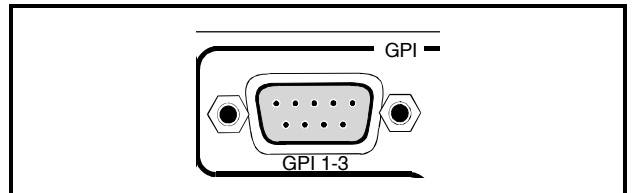


9-Way D Connections

Pin No.	Inputs/Outputs	Ribbon Cable Number
1	CHASSIS	1
6	GND	2
2	Signal +	3
7	Signal -	4
3	Not Used	5
8	Not Used	6
4	Not Used	7
9	Not Used	8
5	Not Used	9

GPI I/O

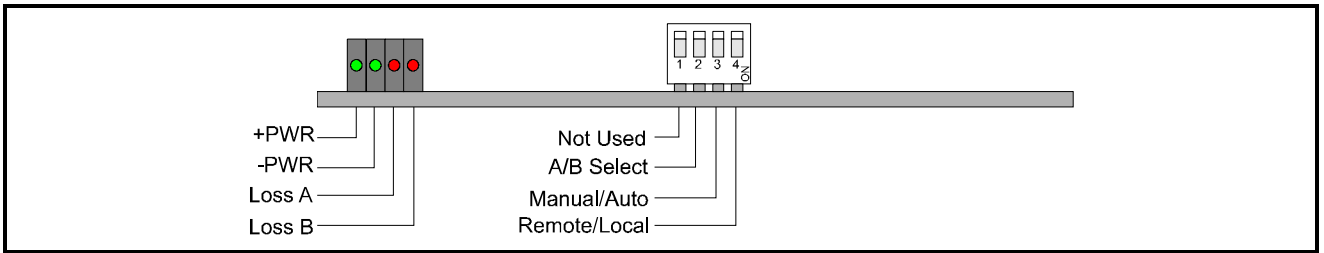
The GPI I/O connections are made via this 9-way D connector.



9-Way D Connections

Pin No.	GPI	Ribbon Cable Number
1	CHASSIS	1
6	GND	2
2	GND	3
7	GPI 2	4
3	GPI 1	5
8	GPI 3	6
4	GND	7
9	Not Used	8
5	Not Used	9

CARD EDGE CONTROLS



INDICATORS

+PWR and -PWR

When illuminated these LED's indicate that the unit is powered.

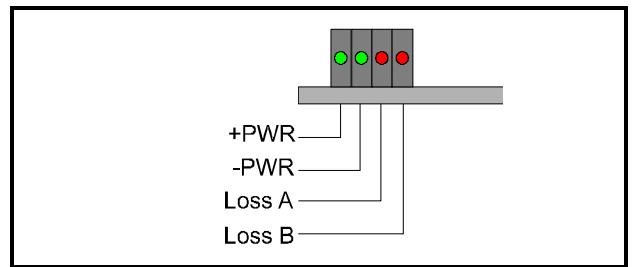
Loss A and Loss B

When illuminated these LED's will indicate that there is no signal at the A or B inputs.

A/B

This LED will indicate which of the two inputs has been selected to become the output.

When illuminated Input B has been selected, when OFF input A has been selected.



4 WAY DIP SWITCH

Position 1 Not used

Position 2 A/B Select

This position allows either the A input or the B input to be selected and routed to the output if manual control is activated – see position 3.

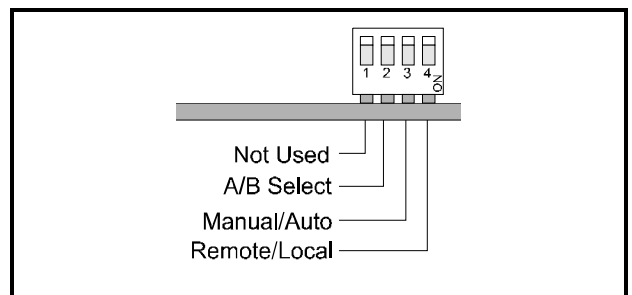
When set to UP (OFF) channel B will be selected, when set to DOWN (ON) channel A will be selected.

Position 3 Manual/Auto

This position allows either manual selection of the input channel using position 2 of this switch or automatic switching in the event of AES Loss.

DOWN (ON) selects Manual and UP (OFF) selects Automatic.

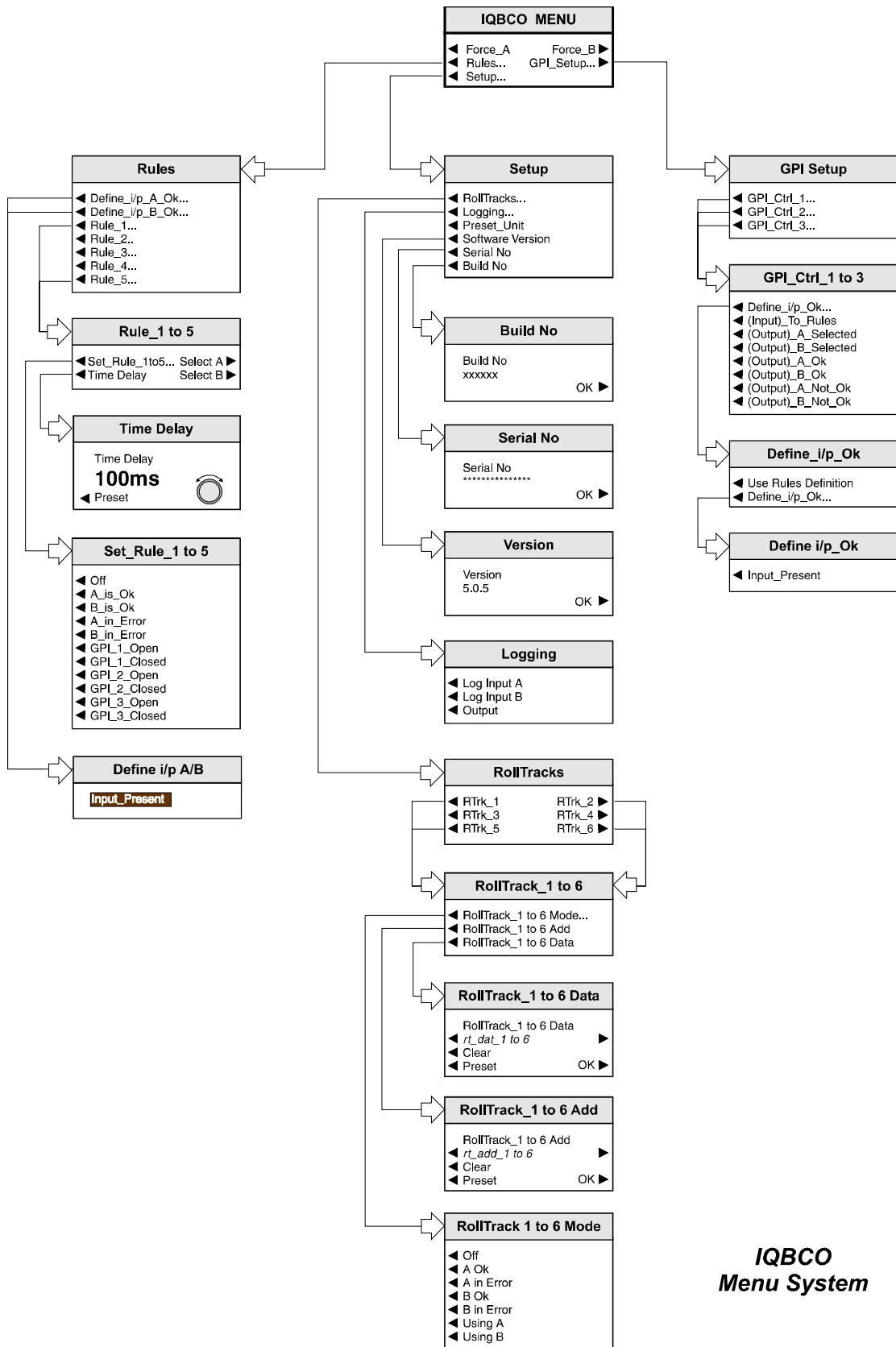
Automatic mode activates the rule based changeover logic detailed in the operation overview section. To program the rules a RollCall control interface such as a RollCall front panel or the IQSPCR PC application is used.



Position 4 Remote/Local

This position allows either remote (RollCall) or local operation (using this DIP switch) of the module.

Note that in Mainframes where RollCall™ is not available it should be set to the DOWN (ON) position. This ensures that when the unit is powered-up the factory default settings of parameters not available as card edge adjustments, are loaded. When set to the UP (OFF) position the card will power-up with the last settings stored in the non-volatile memory. In local mode the default automatic changeover logic selects input B if signal is lost on input A.



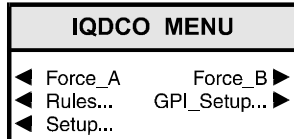
***IQBCO
Menu System***

MENU DETAILS

(see IQBCO Menu System Opposite)

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.

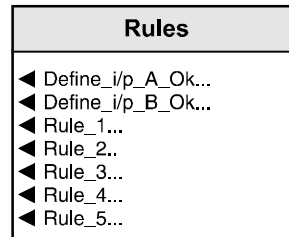
Whenever a menu item is selected the parameters of that selection will be displayed in the Information window of the front panel. Where the selection is purely a mode selection and does not enable a sub-menu, the text will become reversed (white-on-black) indicating that the mode is active. If the mode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



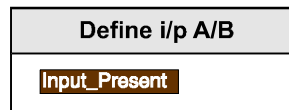
When highlighted these items allow the manual selection of input A or input B. Note that they override all automatic control of the switch.



The automatic operation of the switch is governed by a sequence of Rules (for more information please see Operation Overview section)



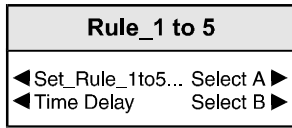
Define i/p A/B



Input Present

This is an essential element in determining that the input is OK! It is always active.

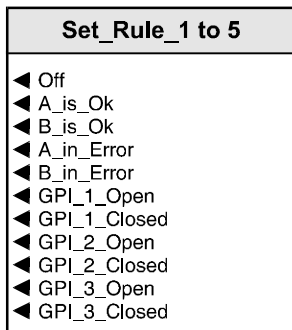
◀ Rule 1 to 5



Select A ▶
Select B ▶

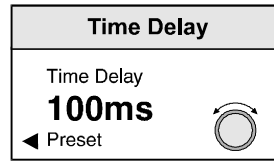
Each of the 5 rules available are programmed in an identical way. Each rule, if evaluated as true, may invoke one of two actions – Select input A or Select input B. If no action is selected then the Rule is effectively disabled.

◀ Set Rule 1 to 5



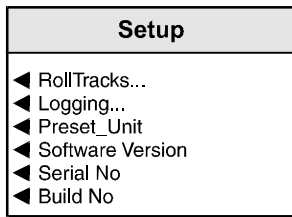
The Rule is set here to any one of 10 possibilities including input checking and GPI condition. 'Off' disables the Rule.

◀ Time Delay



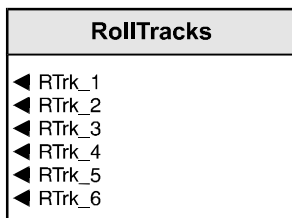
Under each rule it is possible to set a time delay. This is the length of time that the rule must be evaluated as true for before activating the action. If the rule is evaluated as false before the set time expires the action will be prevented and the time reset. The time delay can be set between 0 and 10s.

◀ Setup...



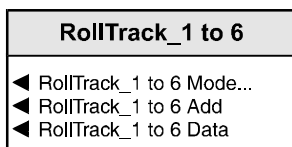
◀ RollTracks

This function allows information about the status changeover switch to be communicated to other RollTrack compatible modules connected to the network. This message can then be used to cause another unit to perform a specific action. Up to 6 RollTrack communication channels to compatible modules may be selected from the following menu:



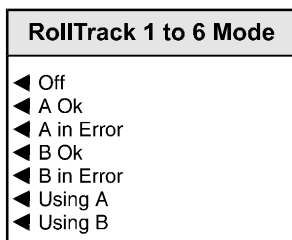
◀ RollTrack _1 to 6

When a particular RollTrack communication channel has been selected the following menu should be used to set up the Mode, Address and Data.



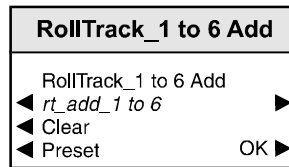
◀ RollTrack 1 to 6 Mode

This sub-menu allows the unit to provide the following information about the status of the changeover switch to the connected RollTrack Unit. The destination unit will then perform a specific action in response to this information.



◀ RollTrack 1 to 6 Add

This item allows the address of the destination unit to be set.



When the item is selected, the first character will be in reversed flashing text; this character can then be changed by rotating the spinwheel. When the desired character is found the button to the left or right of the text line should be pressed and the next text character will be highlighted and available for changing. The buttons to the left and right of the text line may be used to select other characters.

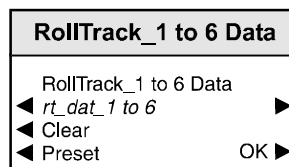
To save the new text, press the OK button. It should be noted that this is the only way to save the new text as any other button function will return to another menu without modifying the original text.

The **Preset** button sets the text line to the default value.

The **Clear** function sets the highlighted character to clear.

◀ RollTrack 1 to 6 Data

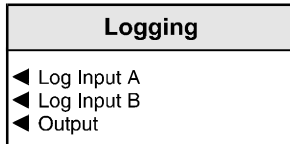
To make the destination unit perform a particular function a RollCall command number must be entered using this function.



For details of the RollCall command numbers for specific units please contact your local Snell & Wilcox agent.

◀ Logging

If a logging device is attached to the RollCall™ network, information about various parameters will be reported to the logging device assigned in the Remote Control Interface system. (See Section 1, The RCIF Menu System)



The logging sub-menu allows the following information to be made available for logging:

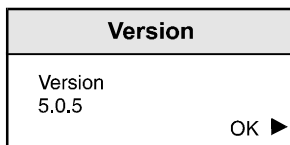
- ◀ Log Input A
- ◀ Log Input B
- ◀ Output

◀ Preset Unit

Selecting this item sets all adjustment functions that include a preset facility, to their preset values. Note that this is a momentary action and the text will not become reversed.

◀ Software Version

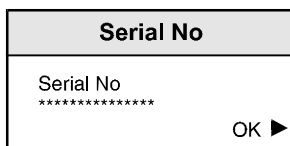
Selecting this item reveals a display showing the version of the software fitted in the module.



Select OK to return to the System Menu

◀ Serial No

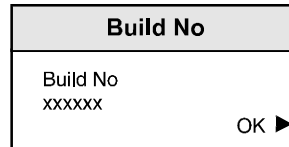
Selecting this item reveals a display showing the serial number of the module.



Select OK to return to the System Menu.

Build No

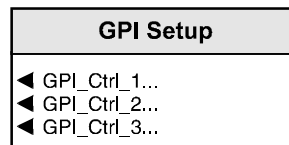
Selecting this item reveals a display showing the build number of the embedded software. This is part of the Snell & Wilcox revision control system.



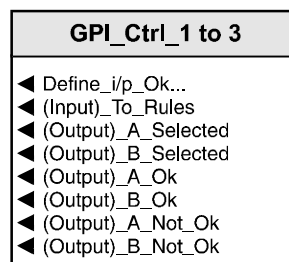
Select OK to return to the System Menu.

GPI Setup... ▶

Three independent GPI ports are provided. These may be individually configured as control inputs or tally outputs

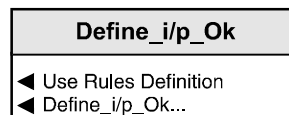


◀ GPI Ctrl 1 to 3



This menu should be used to select the operation of each GPI port. If a GPI input is used in any of the Rule definitions then it **must** be set to **(Input)_To_Rules**

◀ Define i/p Ok



The definition of OK may either follow that used in the Rule logic or be defined individually for each GPI output. The definition selections are the same as those shown above under Rules.

