



IQACO Changeover Switch

Module Description

The IQACO is a passive changeover switch with composite video presence detection. Both inputs are monitored for sync presence, sync amplitude and line standard. The condition for switch over may be programmed to be sync loss or video standard change.

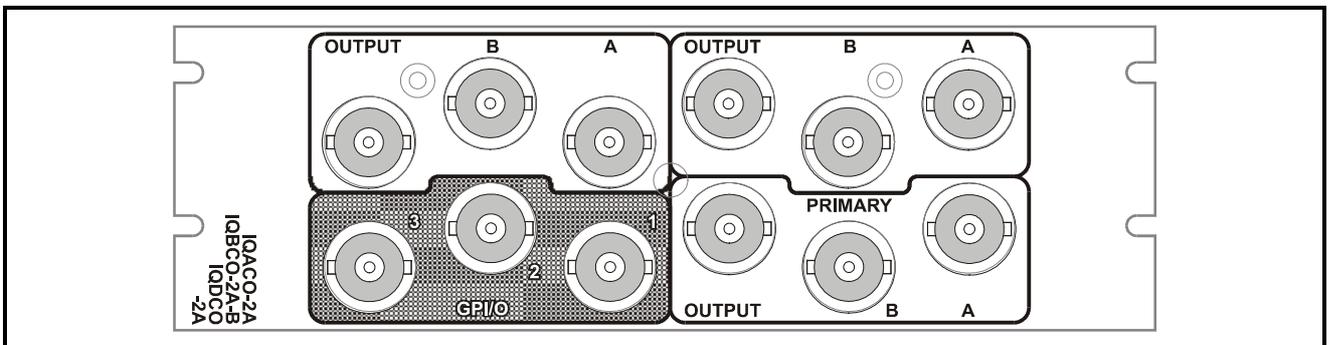
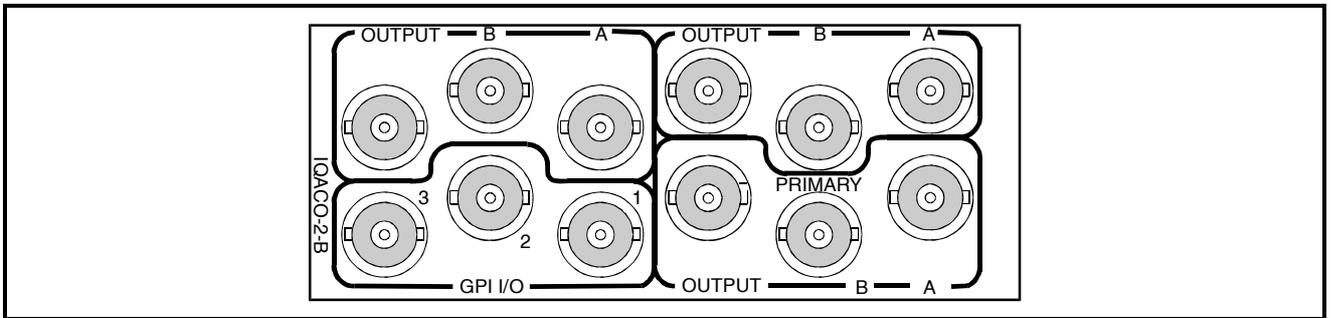
The unit includes three GPI/O's that provide additional trigger inputs or tally outputs. In event of power loss input A is automatically selected. For additional security the relay switch is mounted in

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



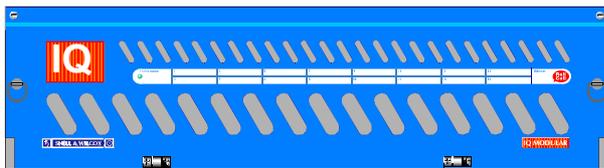
Versions of the module cards available are:

IQDCO-2	IQDCO	SDI Changeover	Double width module
IQDCO-2A	IQDCO	SDI Changeover	Double width module
IQACO-2	IQACO	Video Changeover	Double width module
IQACO-2A	IQACO	Video Changeover	Double width module
IQBCO-2	IQACO	AES Audio Changeover	Double width module
IQBCO-2A-B	IQACO	AES Audio Changeover	Double width module
IQBCO-2A-D	IQACO	AES Audio Changeover	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

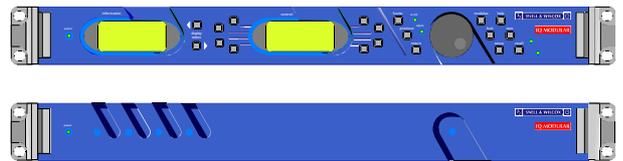
Rear panels **with** the suffix A may only be fitted into the 'A' style enclosure shown below.



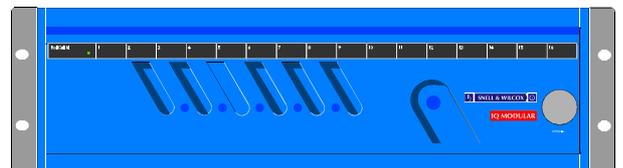
(Enclosure order codes IQH3A-E-0, IQH3A-E-P, IQH3A-0-0, IQH3A-0-P)

'O' Style Enclosures

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



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

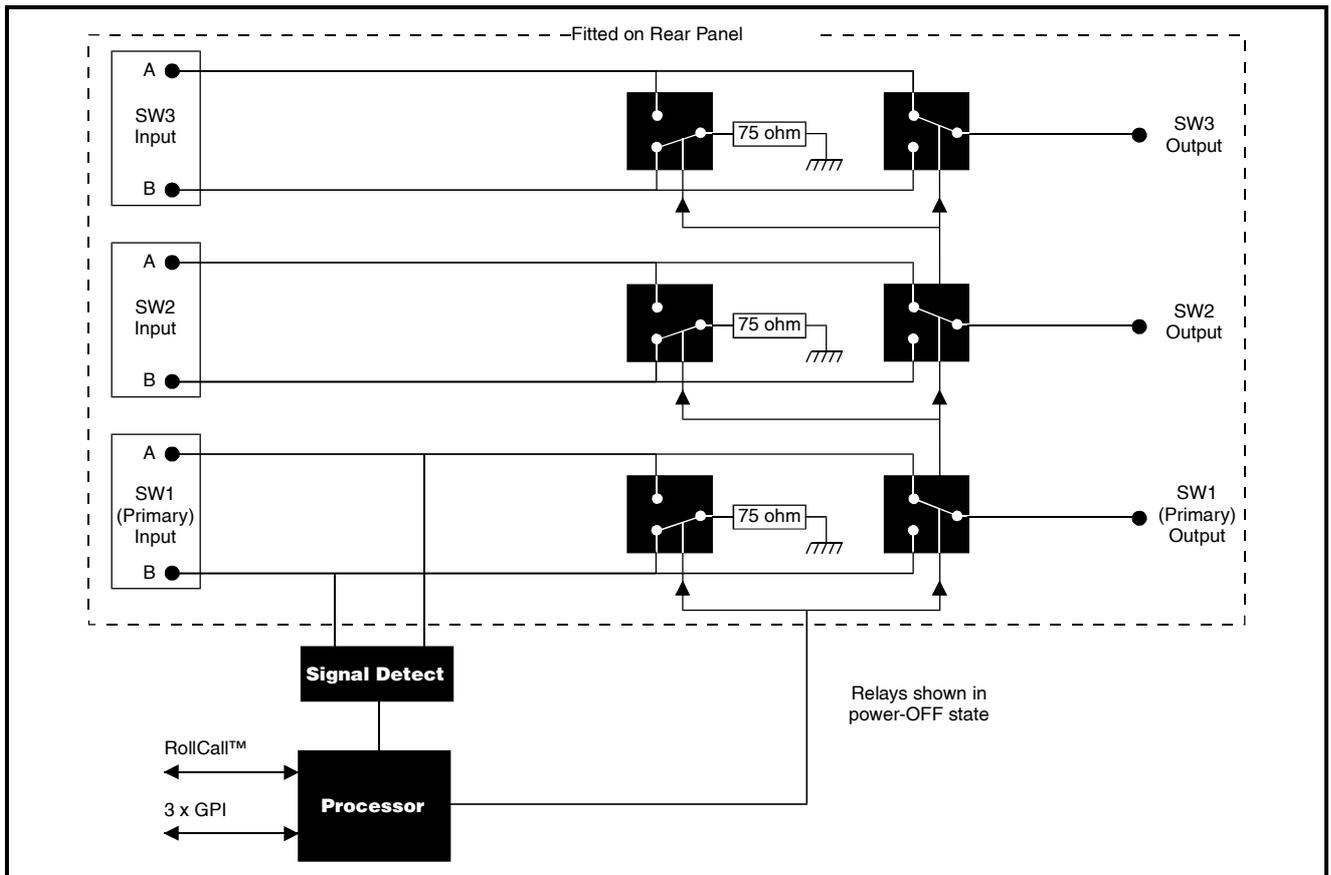


(Enclosure order codes IQH3N-0, IQH3N-P)



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

BLOCK DIAGRAM



Features

- Passive composite / pulse changeover switch
- Automatic switch over on programmable condition(s)
- Detection of sync presence, sync amplitude and line standard
- Continuity (A input) maintained with power loss or module removal
- Three programmable GPI/O's for control or tally
- Programmable switch over time delay
- RollCall remote and card edge control
- RollCall fault logging

TECHNICAL PROFILE

Features

Signal Inputs

Primary Analog 2 per channel (1 channel)
 Composite/Black Burst video via BNC
 Secondary Analog..... 2 per channel (2 channels) For low data rate signals via BNC

Signal Outputs (Passive)

Primary Analog 1 per channel (1 channel) via BNC
 Secondary Analog..... 1 per channel (2 channels) via BNC
 GPI I/O..... 3 x closing contact via BNC

Card Edge Controls (also available via RollCall)

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

Specifications

Analog Input Level Standard levels ± 6 dB
 Input Return Loss (Primary) better than 35 dB to 6 MHz (Output terminated)
 Input Return Loss (Secondary) better than 35 dB to 5 MHz (Output terminated)
 Output Return Loss (Primary) better than 35 dB to 6 MHz (Inputs A and B terminated)
 Output Return Loss (Secondary) better than 35 dB to 5 MHz (Inputs A and B terminated)
 GPI I/O Characteristics Closing Contact Type
 Output Sink Current 100 mA
 Input Source Current 1 mA typical
 Input Threshold Voltage 1 V typical
 Power Consumption
 Module Power Consumption 1W max

Indicators

Power O.K.
 Input Loss A
 Input Loss B
 Input Standard A 525/625
 Input Standard B 525/625
 Low Sync A
 Low Sync 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 10s from trigger condition(s)
 Reporting & Logging Input Loss; Input Line Standard; Low Sync Level

Operational Overview

The IQACO 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, or low sync level '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.

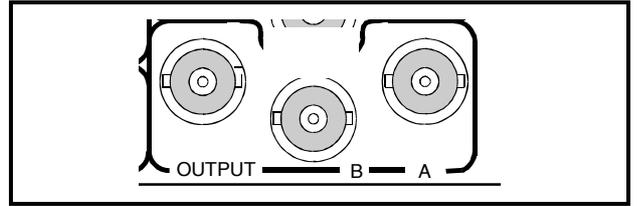
Any of the three GPI ports may be set as tally outputs and the condition under which the output is active (closed contact) is fully programmable. For added flexibility it is possible to set a different definition of 'OK' for the tally than that used for rule checking.

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.

INPUTS AND OUTPUTS

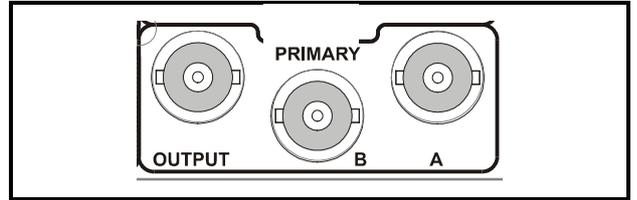
ANALOG INPUTS (A and B)

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



OUTPUT

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

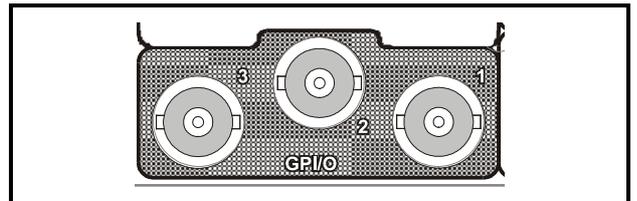
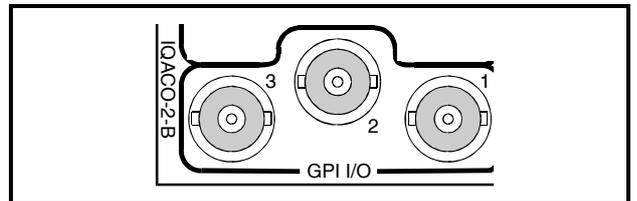


Note:

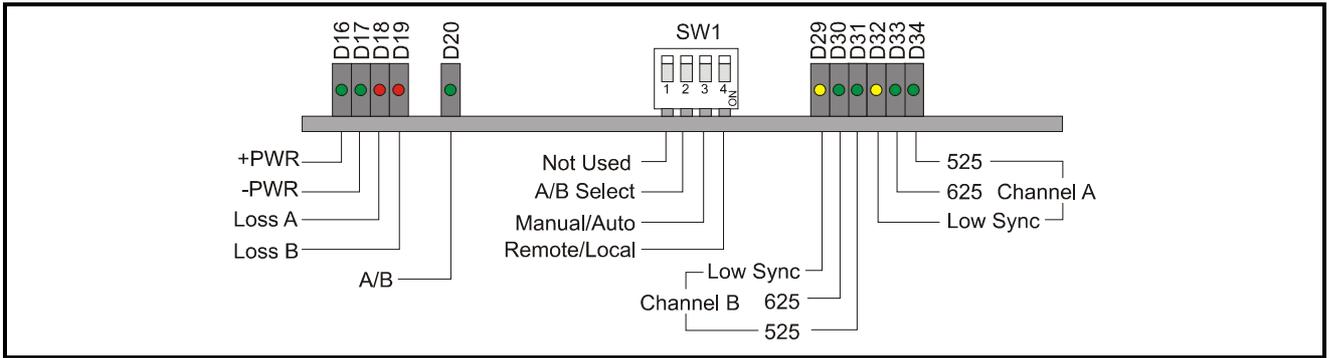
If the Primary output is not terminated correctly by 75 Ohms, the output may alternately select between input A and B until correctly terminated. To overcome this, in some systems it is possible to insert an in-line 75 Ohm termination at the receiving equipment input. This will have a detrimental effect 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.



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 SW1

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.

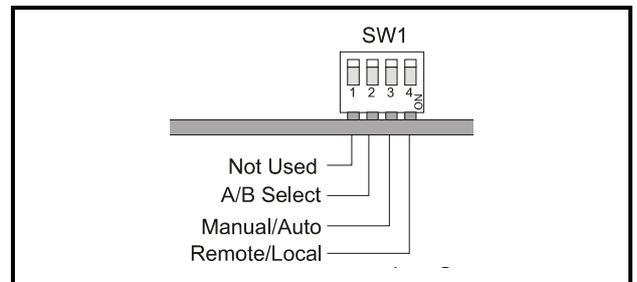
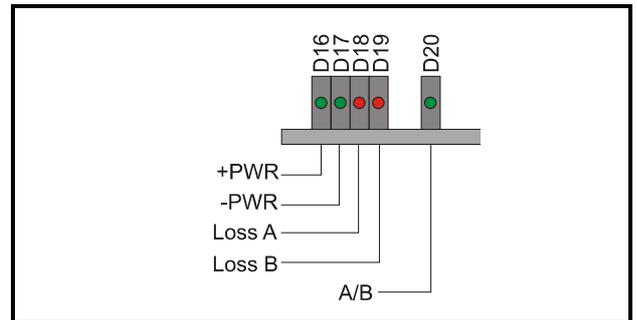
When set to UP (OFF) channel B will be selected, when set to DOWN (ON) channel A will be selected.

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.

CHANNEL A

Low Sync

This LED will be illuminated if the sync level of the input signal is below the sync threshold level setting.

The default value for this setting is 250 mV.

625

This LED will be illuminated when the input signal standard is 625.

525

This LED will be illuminated when the input signal standard is 525.

CHANNEL B

Low Sync

This LED will be illuminated if the sync level of the input signal is below the sync threshold level setting.

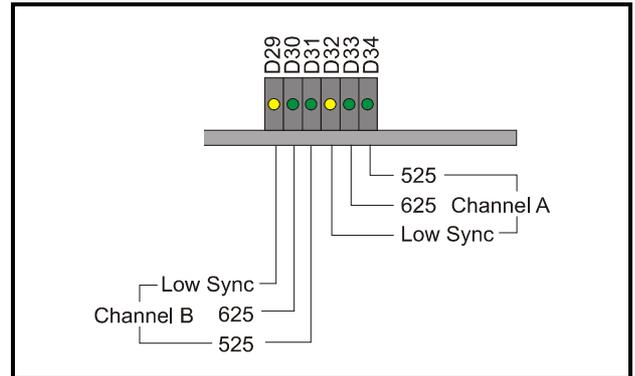
The default value for this setting is 250 mV.

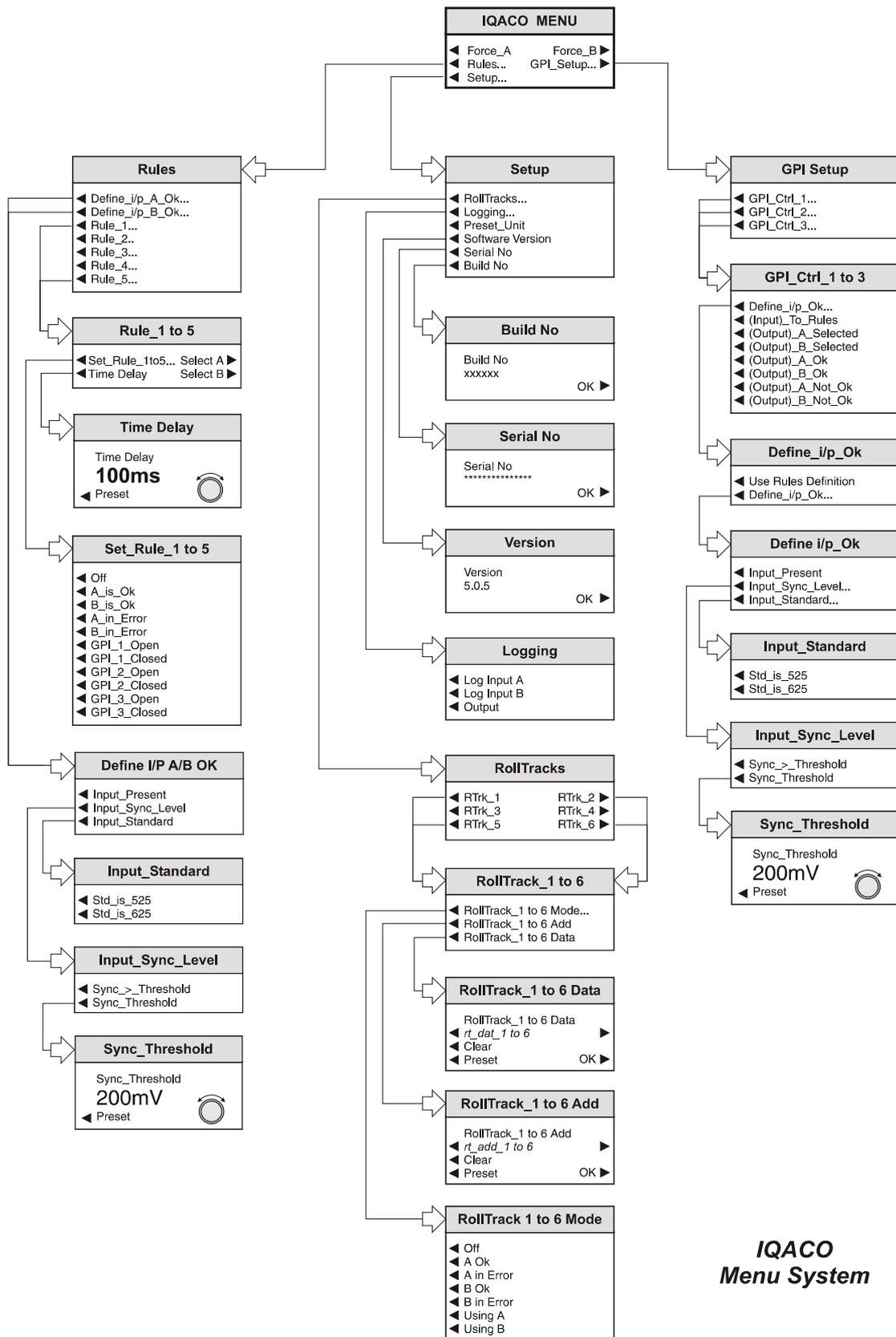
625

This LED will be illuminated when the input signal standard is 625.

525

This LED will be illuminated when the input signal standard is 525.





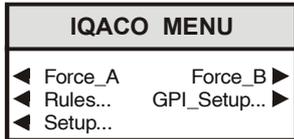
***IQACO
Menu System***

MENU DETAILS

(see IQACO 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.

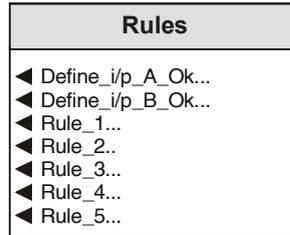
Whenever a menu item is selected the parameters of that selection will be displayed in the Information window of the front panel. Where the selection is purely a mode selection and does not enable a sub-menu, the text will become reversed (white-on-black) indicating that the mode is active. If the mode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

◀ Force A Force B ▶

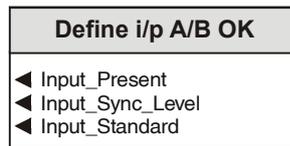
When highlighted these items allow the manual selection of input A or input B. Note that they override all automatic control of the switch.

◀ Rules...

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 OK

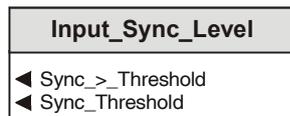


Input Present

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

The definition of OK may be defined using this item.

◀ Input_Sync_Level



This menu allows the definition of OK to be defined as when the sync level of the signal is greater than a set threshold level.

◀ Sync > Threshold

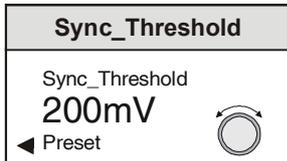
Selecting this item (text highlighted) will enable the function.

Note that the LED card edge indicators will still operate at the set threshold level even when this function is not selected.

◀ Sync_Threshold

This item allows the threshold level of the sync amplitude to be set.

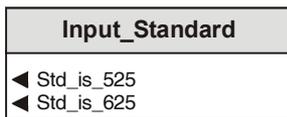
The low sync LED card edge indicator will illuminate when the sync level falls below the Set Threshold level.



The range of control is from 150 mV to 250 mV in steps of 50 mV and preset is to 250 mV.

◀ Input_Standard

This menu allows the standard of the input to be used to define the signal as OK.



Std_is_625

When this item is selected the input will only be considered OK if the detected line standard of the input signal is 625 line.

Preset is to not selected.

Std_is_525

When this item is selected the input will only be considered OK if the detected line standard of the input signal is 525 line.

Preset is to not selected.

Note that only one of the standards may be selected.

◀ Rule 1 to 5

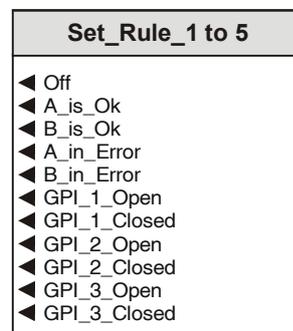


Select A ▶
Select B ▶

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.

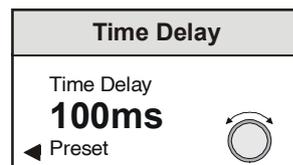
If no action is selected then the Rule is effectively disabled.

◀ 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.

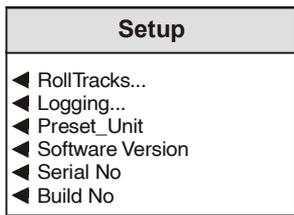
◀ Time Delay



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.

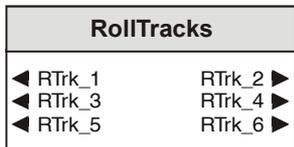
The time delay can be set between 0 and 10s.

◀ Setup...



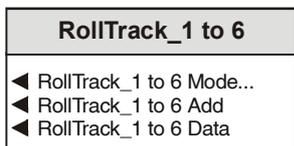
◀ RollTracks

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:



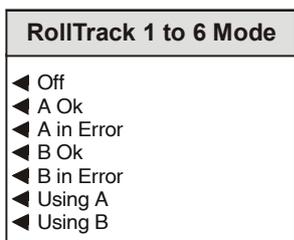
◀ RollTrack_1 to 6

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



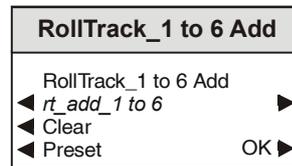
◀ RollTrack 1 to 6 Mode

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.

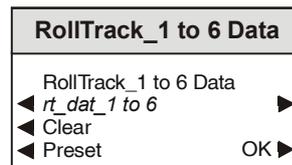
To save the new text, press the OK button. It should be noted that this is the only way to save the new text as any other button function will return to another menu without modifying the original text.

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

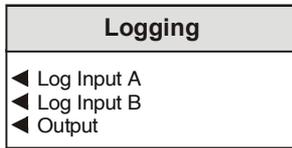
To make the destination unit perform a particular function a RollCall command number must be entered using this function.



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:

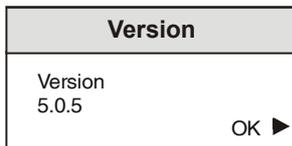
- ◀ Log Input A
- ◀ Log Input B
- ◀ Output

◀ 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

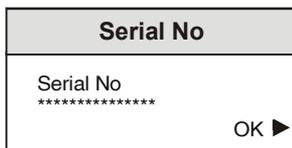
Selecting this item reveals a display showing the version of the software fitted in the module.



Select OK to return to the System Menu

◀ Serial No

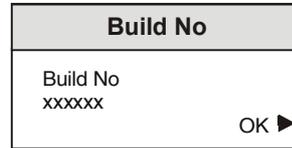
Selecting this item reveals a display showing the serial number of the module.



Select OK to return to the System Menu.

◀ Build No

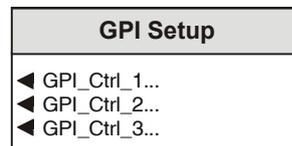
Selecting this item reveals a display showing the build number of the embedded software. This is part of the Snell & Wilcox revision control system.



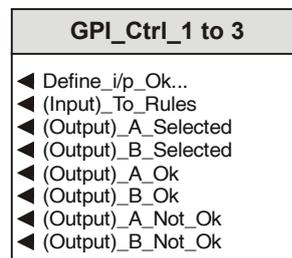
Select OK to return to the System Menu.

▶ GPI Setup... ▶

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

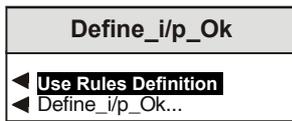


◀ GPI Ctrl 1 to 3



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

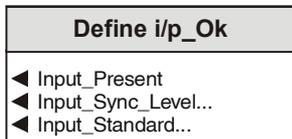


The definition of OK may either follow that used in the Rule logic or be defined individually for each GPI output. The definition selections are the same as those shown above under Rules.

◀ UseRules_Definition

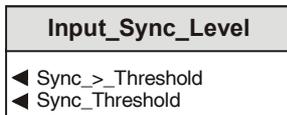
When selected the definition of OK will follow that used in the Rule logic

◀ Define i/p Ok



The definition of OK may be defined using this item.

◀ Input_Sync_Level



This menu allows the definition of OK to be defined as when the sync level of the signal is greater than a set threshold level.

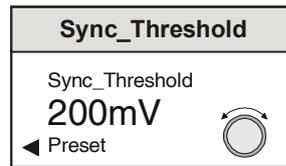
◀ **Sync_>_Threshold**

Selecting this item (text highlighted) will enable the function.

Note that the LED card edge indicators will still operate at the set threshold level even when this function is not selected.

◀ Sync_Threshold

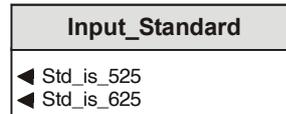
This item allows the threshold level of the sync amplitude to be set.



The range of control is from 150 mV to 250 mV in steps of 50 mV and preset is to 250 mV.

◀ Input_Standard

This menu allows the standard of the input to be used to define the signal as OK.



Std_is_625

When this item is selected the input will only be considered OK if the detected line standard of the input signal is 625 line.

Preset is to not selected.

Std_is_525

When this item is selected the input will only be considered OK if the detected line standard of the input signal is 525 line.

Preset is to not selected.

Note that only one of the standards may be selected.

ROLLCALL CONTROL TEMPLATES FOR THE IQACO

Control

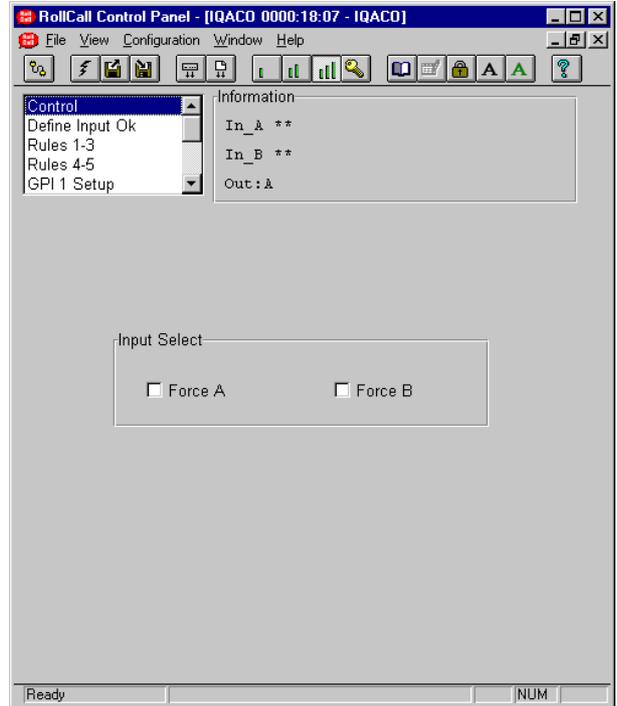
Input Select

Force A, Force B

These items allow one of the inputs to be selected manually.

This will override all other input selection methods.

If neither of the inputs is selected here the input selection will be controlled by other means.



Define Input OK

This screen allows the condition of an input to be defined such that it is considered as valid or OK.

Define Input A as OK, Define Input B as OK

Standard is 625

When this item is selected the input will only be considered OK if the detected line standard of the input signal is 625 line.

Preset is to not selected.

Standard is 525

When this item is selected the input will only be considered OK if the detected line standard of the input signal is 525 line.

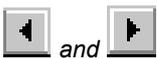
Preset is to not selected.

Note that only one of the standards may be selected.

Sync Level >

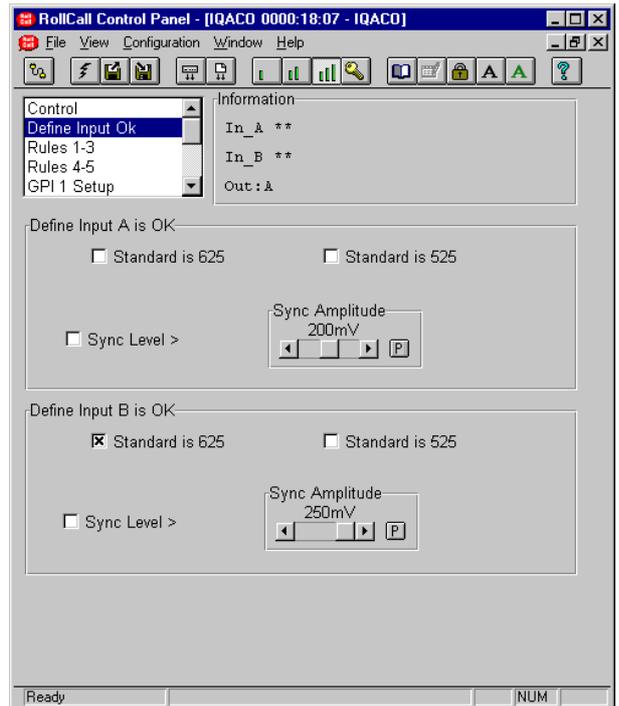
When this item is selected the input will only be considered OK if the sync level of the input signal is greater than the value set by the **Sync Amplitude** control.

Note that for this and other screens the following applies:



The  and  symbols at the ends of the scroll bar allow the value to be adjusted in discrete steps.

The numerical value will be shown above the scroll bars and selecting  (Preset) will return the setting to the preset value for the item.



Sync Amplitude

This scroll bar allows the sync level threshold for the above item to be set.

Note that this control also sets the threshold level for the low sync card edge warning LED.

The range of control is from 150 mV to 250 mV in 50 mV steps.

Preset is to 250 mV.

Note that if none of the above items are selected the input will be considered OK regardless of line standard or sync level; however the card edge low sync warning LED's will continue to operate.

Rules 1-3, 4-5

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

Define Rule 1-3, 4-5

The action that is taken when a particular rule is evaluated as true may be set with this section.

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.

Select Input A, Select Input B

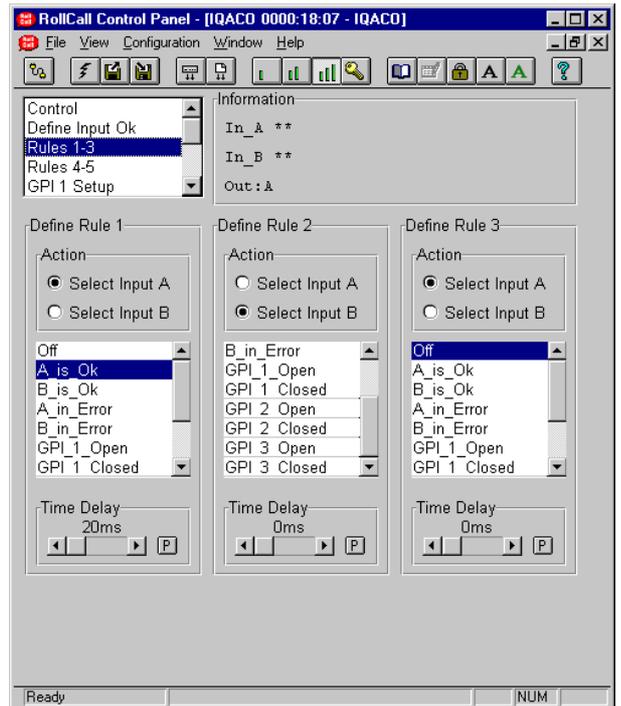
These items will set which input will be selected when the rule is evaluated as true.

The Rule may be selected by highlighting the item and may be set 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.



GPI, 2, 3 Setup

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

GPI Port 1, 2, 3 Function

This item should be used to select the operation of each GPI port.

Input to Rules

If a GPI input is used in any of the **Rule** definitions then this item must be enabled.

GPI Port 1, 2, 3 Output

This item allows the GPI port to be configured as an output and will provide an output corresponding to one of six selectable conditions.

Define Input is OK for GPI 1, 2, 3

The definition of OK may either follow that used in the Rule logic or be defined individually for each GPI output.

Use Rules Definition

When selected the definition of **Input is OK** to produce an output will be that set by the Rules.

Note that when this item is not selected the definition of **Input is OK** will be set by the following:

Standard is 625

When this item is selected the input will only be considered OK if the detected line standard of the input signal is 625 line.

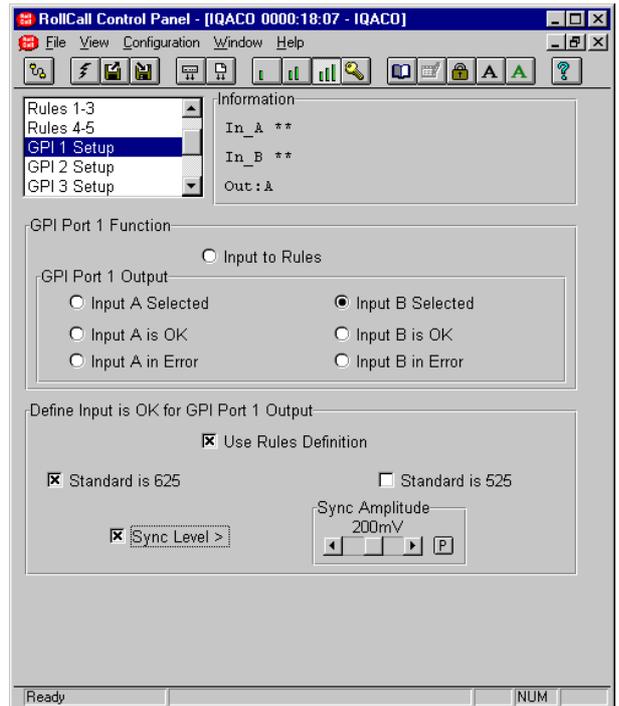
Preset is to not selected.

Standard is 525

When this item is selected the input will only be considered OK if the detected line standard of the input signal is 525 line.

Preset is to not selected.

Note that only one of the standards may be selected.



Sync Level >

When this item is selected the input will only be considered OK if the sync level of the input signal is greater than the value set by the **Sync Amplitude** control.

Setup

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 following information to be made available for logging:

- Input A
- 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.

Software Version

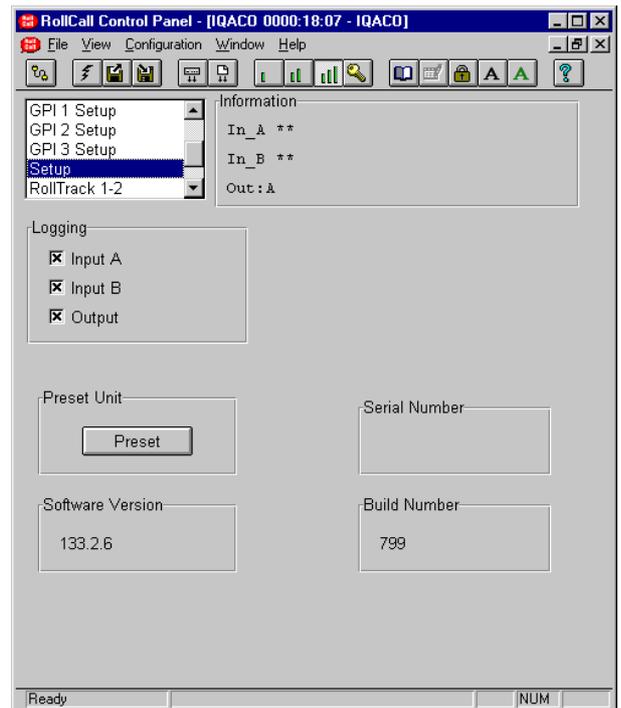
This item will show the version of the software fitted in the module.

Serial Number

This item will show the serial number of the module.

Build Number

This item shows the build number of the embedded software. This is part of the Snell & Wilcox revision control system.



RollTrack 1-2, 3-4, 5-6

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 six RollTrack communication channels to compatible modules may be selected.

RollTrack (Channels) 1-2, 3-4, 5-6

This item allows the unit to provide information (selected from the list) 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.

*Note that if **Off** is selected the RollTrack channel will be disabled.*

The destination for the delay information is set by the network code address as follows:

RollTrack 1-2, 3-4, 5-6 Address

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

To change the address, type the new destination in the text area and then select  (return)

 (Preset) returns to the default destination

The first set (0000) is the network segment code number

The second set (10) is the number identifying the (enclosure/mainframe) unit

For example: 0000:10:01

The third set (01) is the slot number in the unit

RollTrack 1-2, 3-4, 5-6 Data

To make the destination unit perform a particular function a RollCall command number must be entered in the **Command "ID" Value** text window using this function.

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

