

OPERATION MANUAL

STREAM SELECTOR
SIX CHANNEL

STL-96

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INTRODUCTION

The ASHE Stream Selector Model STL-96 is a microcontroller based Instrument for the accurate process control of a multi-stream system in Analytical applications. The STL-96 Stream Selector has a 20 character by 4 line back-lit OLED display which shows the process status and various setting parameters for application specific timing and control of the six Streams. The STL-96 instrument provides a total of 18 nos. of potential freerelay contacts with LED indications on the front panel.

Besides the above, the instrument provides six nos. of 4 to 20mA retransmission **analog outputs** corresponding to each stream. The instrument provides Sample and Hold feature for these 4 to 20mA retransmission outputs.

The STL-96 Stream Selector offers two modes of operation, namely the AUTO and MANUAL modes. The operational logic is as under:

- In the Manual mode, the operator can select a particular Stream number.
- In the Auto mode, there are two sub-modes of operation, viz., the Timer mode and Pulse mode.
 - In the Timer mode, the selected Stream Number is active for the set time.
 - In the Pulse mode, the number of Streams selected based on the Pulse input.

DEFINITION OF TERMS

1. RUN MODE

After Power Supply is switched on, in the **RUN** mode of operation, the Stream Selector will execute the desired sequence of the Streams. The selected Stream output relay gets energized and the corresponding Low Alarm, High Alarm and 4 to 20mA Analog Output gets activated. The **RUN LED** on the front panel will light up to indicate the instrument is in **RUN** mode.

The status of outputs is as follows: -

OUTPUT	STATUS
STREAM OUTPUT	Activated
4-20mA OUTPUT	Activated
LOW ALARM	Activated
HIGH ALARM	Activated

2. STOP MODE

When the Operator presses the **STOP** key from the front panel, the microcontroller stops the process at the current stream and deactivates the selected relay output with latched 4-20mA Output. The **STOP LED** on the front panel will light up to indicate the instrument is in **STOP** mode.

OUTPUT	STATUS
STREAM OUTPUT	Deactivated
4-20mA OUTPUT	Latched
LOW ALARM	Deactivated
HIGH ALARM	Deactivated

3. PAUSE MODE

When the **PAUSE** key is pressed from the front panel, the microcontroller holds the process at the current Stream with all outputs latched on their current status.

The **PAUSE LED** on the front panel will light up to indicate the instrument is in **PAUSE** mode.

OUTPUT	STATUS
STREAM OUTPUT	Latched
4-20mA OUTPUT	Latched
LOW ALARM	Latched
HIGH ALARM	Latched

4. MANUAL MODE

The Stream Selector instrument STL-96 can be operated manually by means of the front selection key. The **MANUAL MODE** is available in both modes of operation, viz.: Timer and Pulse Modes. When the instrument is in **MANUAL MODE**, the Manual LED on the front panel will light up.

The desired stream has to be selected by user.

The OLED display will indicate as follows: -

STREAM	: 01	RUN
TIME	: 0001	
INPUT	: 0500	ppm
MODE	: Manual	

The first line of the display shows which Stream Number is active and also the process status.

The second line of the display shows the time in seconds for which the selected Stream is active. This is not active in Manual Mode.

The third line of the display shows **process variable with respect to input signal** to the instrument.

The fourth line of the display shows the mode of operation selected.

The following is the sequence in the **MANUAL** mode of operation:

- 1) Press **STOP** key if the instrument is in **RUN** mode.
- 2) Press **INC** key to select desired Stream number (1 to 6).
- 3) After selecting the desired Stream, press **START** key to start the process.
- 4) The corresponding Relay output will activate with potential free contacts.
The Low alarm and High alarm will function corresponding to the process input.
- 5) The 4-20mA DC output of the corresponding Stream will be active on the terminals.
The 4-20mA DC outputs of the other Streams get latched to their last values.
- 6) Also, the Low alarm and High alarm of other Streams will get latched to their last status.
- 7) For next Stream, the same sequence from Point no. 1 will be applicable.

5. AUTO MODE

The instrument STL-96 can be operated automatically by means of the key on the front keypad. When the instrument is in **AUTO MODE**, the AUTO LED on the front panel will glow.

The Stream selection is done by the internal microcontroller as per user settings.

The **AUTO MODE** is available in both modes of operation, viz: Timer and Pulse Modes.

a. **TIMER MODE**

The ASHE Stream Selector instrument can be operated in Timer Mode.

In the Setting mode, the operator can select the number of Streams to be run at Power ON. The particular undesired Stream can be skipped in the Skip menu. For the unskipped Streams, the timer value can be set in seconds.

The following sequence is to be carried out in the Timer Auto mode: -

- 1) Press the RUN key to start the process.
- 2) The process will start from the first unskipped Stream.
- 3) The relay for the current Stream gets energized.
- 4) The display shows the remaining time for the current Stream.
- 5) When the timer value becomes zero, the instrument switches over to the next unskipped Stream.
- 6) This cycle goes on until the last unskipped Stream and then goes back to the first stream.

b. **PULSE MODE**

The ASHE Stream Selector instrument can also be operated in Pulse Mode.

In the Setting mode, the operator can select the number of Streams to be run at Power ON. The particular undesired Stream can be skipped in the Skip Menu. For the unskipped streams, the timer value can be set in seconds.

The following sequence is to be carried out in the Pulse auto Mode: -

- 1) Press the RUN key to start the process.
- 2) The process will start from the first unskipped Stream.
- 3) The relay for the current Stream gets energized.
- 4) The display shows the sample time for the current Stream.
- 5) The instrument waits for a synchronizing pulse from the Analyzer.
- 6) As soon as the +12V pulse is received, the instrument stops sampling of the current Stream.
- 7) The instrument switches over to next Stream at the falling edge of the synchronizing pulse.
- 8) This cycle goes on until the last unskipped Stream and then goes back to the first stream.

6. PAGE MODE

The **PAGEMODE** provides the operator with the last updated process values for all Streams on one screen. The process values of all channels can be viewed by pressing the **PAGE/INC** key on the front panel.

The OLED display will appear as follows: -

- 1) 0100
- 2) 0200
- 3) SKIP
- 4) SKIP

INSTALLATION

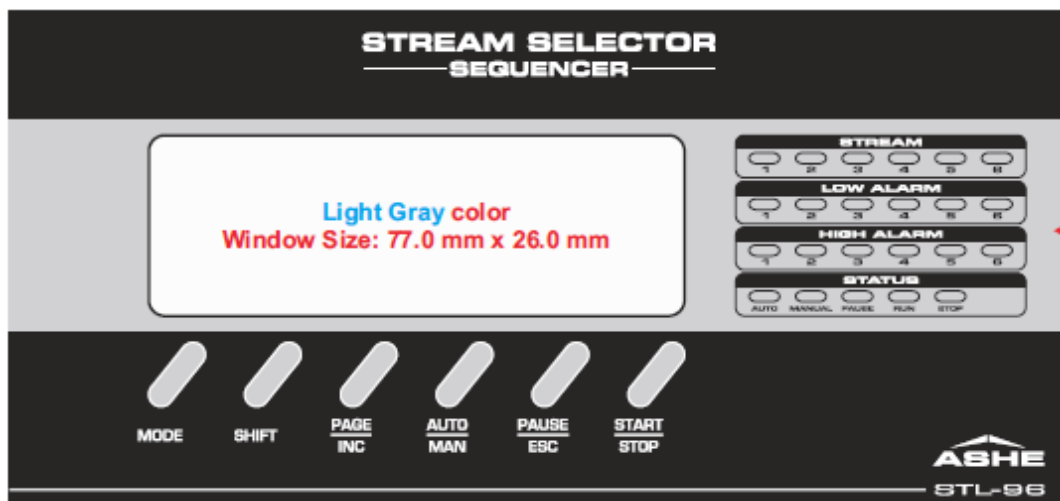
The instrument should first be mounted in an appropriate cut-out on the panel [See *TECHNICAL SPECIFICATIONS*]. All interconnections to the instrument should be made with strong multi-strand wire of the order 2.5 sq.mm. The ends of the wires should be properly ferruled and suitable lugs must be used for effective termination.

The cables carrying the input signal from the Analyzer should be routed separately and properly isolated from the power line cables, to prevent any electromagnetic interference in the input signal readings from the mains power line. The instrument should be earthed to a proper grounding point before connecting the Power Supply. The voltage between the Earth and Neutral terminals should be negligible (Approx. 1 V AC). The Relay contacts are potential free and may be powered as per customer's requirements with the desired voltage.

Further, the instrument is manufactured using selected high-grade components which guarantee its functionality and long operational life. The instrument carries the specified performance warranty against manufacturing defects and workmanship defects.

OPERATION & SETTINGS

The front panel of the Stream Selector is as shown below:



The front panel of the Stream Selector includes the following features:-

- 1) A 20 character x 4-line alphanumeric OLED Display (with backlighting)
- 2) Six nos. of touch-sensitive “Capsense” keys.
- 3) Six nos. **Orange** LEDs to indicate status of the Stream Outputs.
- 4) Six nos. **Red** LEDs to indicate status of the Low Alarms.
- 5) Six nos. **Red** LEDs to indicate status of the High Alarms.
- 6) Three nos. **Red** LEDs to show the status of the Auto, Manual & Pause modes
- 7) Two LEDs of Red & Green to show status of RUN (Green) and STOP (Red).

CONTROL KEYS

The instrument has six touch-sensitive “Capsense” keys on the front panel, the functions of which are described below:

MODE	This key is used for all instrument settings and calibration, as follows:- Input Calibration, Input Range, Skipping of Streams, Alarms Settings (Low Alarm & High Alarm), Retransmission output calibration (4-20mA DC) and Operation Mode Setting.
SHIFT	In the “running” mode, this key is used to switch over to the next stream, and In the “setting” mode, this key is used to shift the cursor.
PAGE INC	This key is an alternating key between PAGE/INCREMENT options. In the “running” mode, this key is used to show the input status of all Streams together. In the “setting” mode, this key is used to increment the value of the selected digit.
AUTO MANUAL	This key is used to select alternatively between AUTO/MANUAL modes of operation.
PAUSE ESC	This key is used to PAUSE the process. The microcontroller will stop the process, while keeping the relay status unchanged. Also the same key is used to escape from parameter setting mode.
START STOP	This key is used to toggle the START and STOP process.

SETTINGS OF PARAMETERS

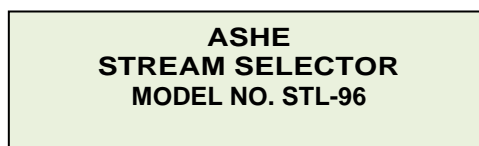
POWER ON SCREEN

The ASHE STL-96 operates on universal AC power supply of 90 to 270VAC, 50Hz.

When the instrument is powered ON, the display will go blank with only backlight for a period of 5 seconds.

This time has been provided for power supply stabilization within the instrument.

The **Power ON Screen** on the OLED Display as indicated for five seconds shall be as follows –



This shows that the microcontroller has initialized properly.

The power ON screen shows the manufacturer's name, the product name and the model number.

PROCESS SCREEN

After the Power ON screen, the instrument will go to **Process Screen** as follows:

STREAM :	01	RUN
TIME :	0001	
INPUT :	0500	ppm
MODE :	Timer - Auto	

The first line of the display shows which Stream Number is active and also the process status.

The second line of the display shows the time in seconds for which the selected Stream is active. This is not active in Manual Mode.

The third line of the display shows **process variable with respect to input signal** to the instrument.

The fourth line of the display shows the mode of operation selected.

PARAMETER SETTING MODE SCREEN

Press **MODE** key to enter into Parameter Setting mode.

After pressing **MODE** key the display will show the following screen –

1) I/P CAL	2) I/P RANGE
3) SKIP	4) ALARMS
5) ReTrans	6) SETTINGS
Select Menu	: 00

Enter the number for the mode selected (01 to 06) using the **INC** key and press **MODE** key again to confirm the selected parameter setting mode.

If there is no key process for 10 seconds, then the display will time-out and return to the process screen.

INPUT CALIBRATION MODE

The ASHE Stream Selector Model STL-96 is factory calibrated. As such, the instrument does not require any recalibration at the customer's side. So do not enter into Input Calibration Mode unless the instrument requires recalibration.

Before entering into Input Calibration Mode, ensure that an accurate analog signal of 4 to 20mA DC is connected to the instrument at the input terminals with correct polarity.

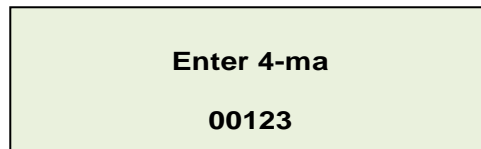
Enter the number **01** into Select Menu by using **INC** key in the **PARAMETER SETTING MODE SCREEN**. Press **MODE** key to enter into **Input Calibration Mode**.

The OLED Display indicates as under :

Password
0000

Press the **SHIFT** key to move the cursor to the last digit.

Enter the Password **0004** by using **INC** key and then press **MODE** key. After pressing **MODE** key the OLED Display will show as follows :-



Enter 4-ma
00123

Feed 4mA DC Current from a reliable 4 to 20mA source to the instrument. The display will show the corresponding ADC Count corresponding to 4mA input current.

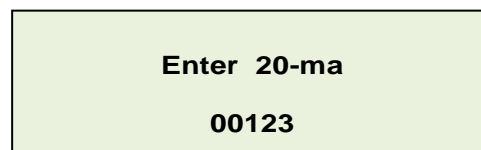
Press the **AUTO/MANUAL** key to save the ZERO calibration point of 4-20mA DC Input.

The OLED Display will show the message DATA SAVED to acknowledge this setting.



DATA SAVED


Press **MODE** key to move on to the Span Calibration point. After pressing the **MODE** key, the OLED Display will show:



Enter 20-ma
00123

Feed 20mA DC Current from 4 to 20mA source to the instrument. The display will show the corresponding ADC count corresponding to 20 mA DC input current.

Press the **AUTO/MANUAL** key to save the SPAN calibration point of 4-20mA DC Input. The OLED Display will show the message "**DATA SAVED**" to acknowledge this setting.



DATA SAVED

This will complete the input signal 4-20mA DC calibration of the instrument. Press the **MODE** key to exit from **Input Calibration Mode**.

After pressing the **MODE** key, the OLED Display will return to **PROCESS SCREEN**.

INPUT RANGE MODE: -

The ASHE Stream Selector Model STL-96 has the facility to change the resolution and range of the displayed process value.

Enter the number **02** into the Select Menu by using **INC** key in the **PARAMETER SETTING MODE SCREEN**.

Press the **MODE** key to enter into **Input Range Mode**. After pressing the **MODE** key, the OLED Display shows :

Password
0000

Press the **SHIFT** key to move the cursor to the last digit. Enter the Password **0004** by using the **INC** key and then press **MODE** key to confirm. After pressing **MODE** key the OLED Display will show

Set Resolution 01
1234

The customer can set the resolution and display range for each stream individually.

Use the **INC** key to select the desired decimal point for display process value.

Press the **MODE** key to proceed further. After pressing the **MODE** key, the microcontroller will save the settings. Set the decimal point for stream number 01 and move to the low range setting.

Set Low range 01
0000

Use the **SHIFT** key to shift the cursor to desired digit and the **INC** key to change the desired digit from 0 to 9.

Press the **MODE** key to save the lower range for Stream no. 01 and move to high range setting.

Set High range 01
1000

Use the **SHIFT** key to shift cursor to desired digit and **INC** key to change the desired digit from 0 to 9.

Press the **MODE** key to save higher range for stream no. 01 and move to the next parameter.

After pressing **MODE** key the OLED Display will show:

Set Resolution 02
1234

In the same sequential process, the following parameters for each Stream can be set :

- Resolution (Decimal Point)for Streams 1 to 6.
- Low Range for Streams 1 to 6.
- High Range for Streams 1 to 6.

On completion of the settings for Stream 6, this completes the settings and calibration process for all the streams.

After pressing the **MODE** key, the OLED Display will return to the normal **PROCESS SCREEN**.

STREAM SKIP MODE

The ASHE Stream Selector Model STL-96 offers the facility to SKIP a particular stream from the process. Also one can set the Sampling Time of a Stream from 0001 to 9999 seconds which is useful during operation in **Timer Mode**.

Enter the number **03** into the Select Menu by using the **INC** key in the **PARAMETER SETTING MODE SCREEN**.

Press the **MODE** key to enter into **Stream Skip Mode**.

After pressing the **MODE** key, the OLED Display shows:

Password
0000

Press the **SHIFT** key to move cursor to the last digit. Enter Password **0004** by using the **INC** key and press **MODE** key to confirm.

After pressing **MODE** key the OLED Display will show:

Skip channel 01
No

The customer can set the resolution and display ranges for each stream individually.

Use **INC** key to select desired Skip setting by selecting **YES/NO** for the particular Stream number.

Press the **MODE** key to proceed further. After pressing **MODE** key, the microcontroller will save the set Skip setting for stream no. 01 and move to Sample Time setting.

Set Sample time 01
0005

If the operator selects **SKIP** for a particular stream Number, then the display will directly move to **SKIP** setting of the next Stream number instead of Sample Time setting.

Use the **SHIFT** key to shift cursor to desired digit and **INC** key to change the desired digit from 0 to 9. The sampling time can be set from 0001 to 9999 seconds.

During operation in Timer Mode, the particular Stream will be active for the set Sample Time. Press the **MODE** key to save Sampling Time of Stream number 01 and move to next Skip setting.

In the same sequential process, the following parameters for each Stream can be set :

- Skip Channel for Streams 1 to 6.
- Set Sample Time for Streams 1 to 6.

Press the **MODE** key to save Sampling Time of Stream no. 06 and exit from **STREAM SKIP MODE**.

This completes the Stream Skip and Sampling Time settings.

After pressing the **MODE** key, the OLED Display will return to the normal **PROCESS SCREEN**.

STREAM ALARMS MODE

The ASHE Stream Selector Model STL-96 provides individual Low and High Alarm for each stream. The Low and High Alarms can be set throughout the range.

Select the number **04** in the Select Menu by using **INC** key in the **PARAMETER SETTING MODE SCREEN**.

Press **MODE** key to enter into **Stream Alarms Mode**. After pressing **MODE** key, the OLED Display shows :

Password
0000

Press **SHIFT** key to move cursor on last digit. Enter Password **0004** by using **INC** key and press **MODE** key.

After pressing **MODE** key the OLED Display will show:

Set Low Alarm 01
0400

The operator can set the resolution and display range for each stream individually.

Use the **SHIFT** key to shift cursor to desired digit and **INC** key to change the desired digit from 0 to 9. The Low Alarm of Stream can be set throughout the range.

Press **MODE** key to proceed further. After pressing **MODE** key, the microcontroller will save the Low Alarm setting for stream no. 01 and move to next parameter.

Set High Alarm 01
0600

Use **SHIFT** key to shift cursor to desire digit and **INC** key to change the desire digit from 0 to 9. The High Alarm can be set throughout the range.

Press **MODE** key to proceed further. After pressing **MODE** key, the microcontroller will save High Alarm setting for stream no. 01 and move to next parameter.

In the same sequential process, the following parameters for each Stream can be set :

- Low Alarm for Streams 2 to 6.
- High Alarm for Streams 2 to 6.

Press **MODE** key to proceed further. After pressing **MODE** key, the microcontroller will save High Alarm setting for stream no. 06 and exit from **STREAM ALARMS MODE**.

This completes the Stream Alarm settings.

After pressing **MODE** key, the OLED Display will return to the normal **PROCESS SCREEN**.

RETRANSMISSION (4-20mA DC) OUTPUT CALIBRATION MODE

The ASHE Stream Selector Model STL-96 provides individual 4 to 20mA retransmission output for each stream. All retransmission outputs are factory calibrated and do not require recalibration at the customer's side. So do not enter into Retransmission Calibration Mode unless the instrument requires recalibration.

Before entering into Input Calibration Mode, ensure that a reliable 4 to 20mA source is connected to the instrument at the Input terminals with correct polarity.

Feed a DC current less than 4mA the source to the instrument. The process value on the OLED Display will show "Low".

Enter the number **05** into Select Menu by using **INC** key in the **PARAMETER SETTING MODE SCREEN**.

Press the **MODE** key to enter into **Retransmission Output Calibration Mode**.

The OLED Display shows:

Password
0000

Press **SHIFT** key to move the cursor to the last digit.

Enter the Password **0004** by using **INC** key and press **MODE** key.

After pressing **MODE** key the OLED Display will show:

O/P zero adjust 01
34

Connect a milliamp-meter across 4-20mA OUTPUT1 terminals with the correct polarity.

The display will show the corresponding ADC count corresponding to 4mA Output current.

Use the **SHIFT** key to shift the cursor to desired digit and **INC** key to change the desired digit from 0 to 9 to get 4mA on the milliamp meter.

Press **MODE** key to save the **ZERO** calibration point of 4-20mA DC for Output 1.

In the same sequential process, the following parameters for each Stream can be set :

- Output Zero Adjust for Streams 2 to 6.
- High Alarm for Streams 2 to 6.

This completes the 4-20mA retransmission analog output calibration of the instrument.

Press **MODE** key to exit from **Retransmission Calibration Mode**. After pressing the **MODE** key, the OLED Display will return to normal **PROCESS SCREEN**.

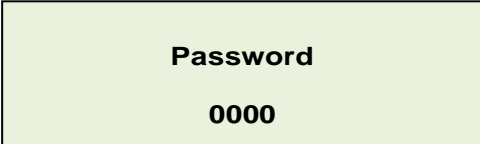
SETTING MODE

The ASHE Stream Selector Model STL-96 provides both, AUTO and MANUAL modes of operation. One can select AUTO or MANUAL mode directly from the front panel key. There are two sub-mode options in the AUTO mode of operation, viz. Timer and Pulse modes.

Enter the number **06** into the Select Menu by using **INC** key in the **PARAMETER SETTING MODE SCREEN**.

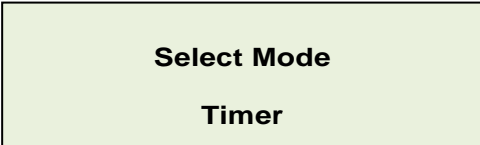
Press **MODE** key to enter into the **Setting Mode**.

The OLED Display shows:



Password
0000

Press the **SHIFT** key to move the cursor to the last digit. Enter Password **0004** by using **INC** key and press **MODE** key. After pressing the **MODE** key, the OLED Display shows

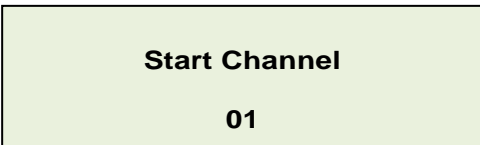


Select Mode
Timer

Use the **INC** key to select the desired mode of operation to either **Timer** or **Pulse**.

Press the **MODE** key to proceed further. After pressing **MODE** key, the microcontroller will save selected mode of operation and move to Sample Time setting.

After pressing the **MODE** key, the OLED Display shows:

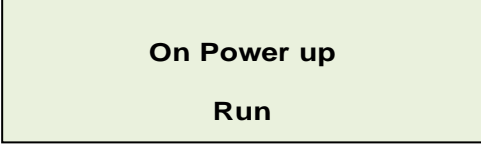


Start Channel
01

Use the **SHIFT** key to shift the cursor to desired digit and **INC** key to select desired number of stream (01 to 06). This has to be activated at the time of Power ON.

Press the **MODE** key to proceed further. After pressing **MODE** key, the microcontroller will save the set Number of stream as **Start Channel** and move to Sample Time setting.

After pressing **MODE** key, the OLED Display shows



The image shows a rectangular box representing the OLED display. Inside the box, the text "On Power up" is displayed on the top line, and "Run" is displayed on the bottom line. Both lines of text are centered horizontally.

Use the **INC** key to select the desired setting of Process Status on Power Up. Press **MODE** key to proceed further. After pressing **MODE** key, the microcontroller will save this setting.

This completes the entire setting procedure for the Stream Selector.

Press the **MODE** key to exit from **Setting Mode**.

After pressing the **MODE** key, the OLED Display will return to the normal **PROCESS SCREEN**.

TERMINAL DIAGRAM

The terminal details of the Stream Selector Model STL-96 are as under:

C	NO	C	NO	C	NO	C	NO	C	NO	C	NC	NO		+	-	+	-	+	-	+	-	+	-	+	-	+	-		+	-	+	-	B	A	G	
RLY-1	RLY-2	RLY-3	RLY-4	RLY-5	RLY-6	RLY-12		1	2	3	4	5	6															4-20 mA DC	PULSE INPUT							RS485 COMM
STREAM OUTPUT RELAYS						LOW ALARM RELAY	4 to 20 mA OUTPUT SIGNALS												INPUT SIGNALS																	
www.ashecontrols.com • ASHE CONTROLS PVT. LTD, MUMBAI, INDIA • sales@ashecontrols.com																																				
AC POWER SUPPLY		LOW ALARM RELAYS												HIGH ALARM RELAYS																						
		RLY-7	RLY-8	RLY-9	RLY-10	RLY-11	RLY-13	RLY-14	RLY-15	RLY-16	RLY-17	RLY-18																								
L	N	E	NO	NC	C	NO	NC	C	NO	NC	C	NO	NC	C	NO	NC	C	NO	NC	C	NO	NC	C	NO	NC	C	NO	NC	C	NO	NC	C	NO	NC	C	

UPPER ROW

TERMINAL BLOCK	NOTATION	DETAILS
STREAM OUTPUT RELAY	C	RELAY -1
	NO	
	C	RELAY 2
	NO	
	C	RELAY 3
	NO	
	C	RELAY 4
	NO	
	C	RELAY 5
	NO	
	C	RELAY 6
	NO	
LOW ALARM RELAY	C	RELAY 12
	NC	
	NO	
4 – 20 mA OUTPUT SIGNALS	+	OUTPUT 1
	-	
	+	OUTPUT 2
	-	
	+	OUTPUT 3
	-	
	+	OUTPUT 4
	-	
	+	OUTPUT 5
	-	
	+	OUTPUT 6
	-	
INPUT SIGNALS	+	4 to 20mA DC
	-	
	+	PULSE INPUT
	-	
RS-485	B	RS-485

TECHNICAL SPECIFICATIONS

Model	:	STL-96
Type	:	Micro-controller based Stream Selector.
Input Signal	:	Analog 4 to 20mA DC (4 - Wire) Digital Pulse Input (For Stream Selection)
Number of Streams	:	Six nos.
Display	:	20 x 4 Alphanumeric OLED Displaywith white Backlight and Black Text. 6nos.LEDS for status of Streams 6nos.LEDS for indication of Low Alarm 6nos.LEDS for Indication of High Alarm 3nos.LEDS for Status Indication (Auto/Manual/Pause) 1no. LED for Start (RUN)
1 no. LED for Stop status indication		
Scale Range	:	0000 to 9999 (Selectable)
Response time	:	Typically 500mS.
Relay Outputs	:	For Streams SixPotential Free Relay Contacts For Low Alarm Six Potential Free Relay Contacts For High Alarm Six Potential Free Relay Contacts
Contact rating	:	10 Ampere @ 230 V AC (Resisitive Loads).
Memory	:	Non-Volatile (on EEPROM).
Settings	:	By six nos. of touch sensitive keys on front panel.
Features	:	Control Logic, Set points, Hysteresis etc.
Accuracy	:	±1% FSD.
Power Supply	:	90 to 270 VAC, 50 Hz, universal AC power.
Enclosure	:	Panel mounting.
Bezel Dimensions	:	160 x 80 mm
Cut-out Dimensions	:	151 x 75 mm
Depth	:	150 mm
Weight	:	Approximately 1.0 kgs.