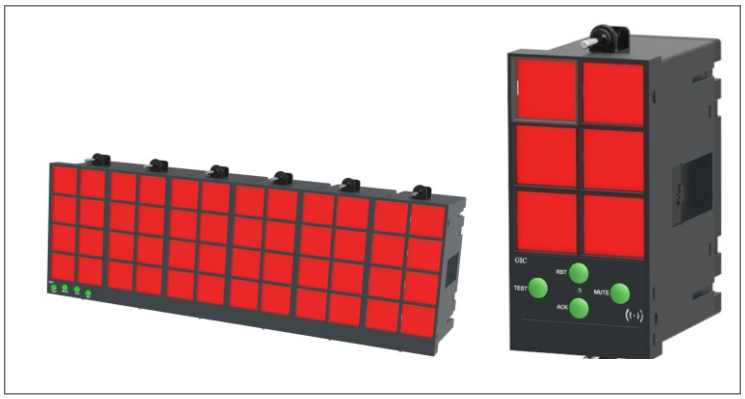
ALARM ANNUNCIATOR



INTRODUCTION:

GIC introduces Alarm annunciators with the most advanced features. With increasing automation at every stage in a process control system, our Alarm Annunciator would play a vital role in immediate fault recognition by providing instant visual and audible alarms to protect valuable equipments.However simple or complex your alarm requirement, our Alarm Annunciator will provide the most cost effective solution.

FEATURE :

- **A. Design Features:**
- Optical isolation in fault inputs and between Base and extension.
- Low power, super bright White LEDs for window illumination.
- Low Power consumption of 0.5W per window.
- Computer interface with RS485 Modbus RTU protocol for read and write.
- EMI/EMC compliance as per IEC standards thereby offering complete reliability.
- Supports up to 300 meter length cable for fault input and remote keys connection.
- Four SPDT relay outputs (2 for Grouping(G1,G2), 1 for external hooter, 1 for ring back / supervisory relay).
- Supervisory relay output will always be ON indicating self supervision and system reliability for all sequences except Ring back sequence. For ring back sequence it will work as per Ring back sequence.
- G1,G2 relays are fault follower.

B. Constructional Features:

- Standard Models available from 2 to 48 windows.
- Field expandable from 2 to 48 windows with maximum 5 extension units.
- Choice of 3 window sizes with field configurable provision.(Small - 34mmx31mm, Medium-68mmx31mm and Large -68mmx63mm).
- Depth of housing is only 100mm.
- Available in six window colors – Red, Yellow, Blue, Green, Amber and White.
- Available in Big or Small push button.

C. Functional Features:

- Field selection for NO / NC fault input contacts, grouping of alarms, window size configuration.
- Selectable Potential Free with fault input voltage range (12V – 240V AC/DC +/-10%) , Potential Free only.
- Integral push buttons for Test, Acknowledge, Mute, and Reset operations. Provisions of output connections for remote access of push buttons.
- Sequence selection as per ISA standard.
- User Configurable Integral buzzer Functionality for audible output upto 90dB.

D. Optional Features:

- Stand by supply as optional accessories.
- In fast scan product advance feature of Man/Unmanned.
- In fast scan product additional feature of replaceable LEDs.

E. Modular Features:

- Replaceable windows and window legends.

WORKING PRINCIPLE:

Whenever there is a change in fault input contact from normally open to close(NC) or normally close to open(NO) position, annunciator changes from normal condition to alarm condition. Hence there is an immediate recognition of fault input which will have a corresponding visual and audio alarm as per the particular selected program sequence. Alarm Annunciator has four keys are Mute, Acknowledge, Reset and Test Function. Mute key deactivate internal Buzzer. Acknowledge key use to accept the fault condition. Reset key enables to reset the alarm sequence to its fault state. Test key helps to perform the complete test of the system.

TECHNICAL SPECIFICATIONS:

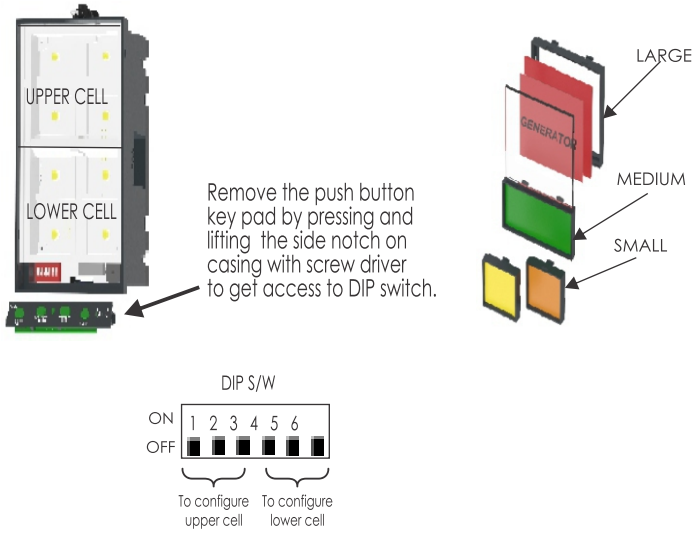
Parameter	Description	
Supply Characteristics:		
Supply Voltage	90V-270V AC/DC	18-60 VDC
Supply Frequency	50/60 Hz	–
Power consumption	0.5W per window	
LED Indication (Green)	ON - Healthy Blinking -Error [Fast Blinking Rate- 500msec Cyclic ON/OFF] Error: 1. User selected wrong windows configuration. 2. Number of windows are more than number of fault inputs .	
Annunciator Characteristics:		
No. of windows	2 to 48 windows in different configurations	
Window size	Small-34x31mm, Medium-68x31mm, Large-68x63mm	
Window colour	Red, Yellow, Blue, Green, Amber and White	
Illumination	Low power super bright white LEDs	
Fault input signal	Potential free (NO/NC field selectable)	
Fault input voltage	Internal – 12V DC/External :12V-240V AC/DC (+/- 10%)	
Scan time	100 msec	
Flash rate	1) Fast flash – 0.5 Sec ON / 0.5 Sec OFF (60 flashes/Min) 2) Slow flash – 0.5 Sec ON / 1.5 Sec OFF (30 flashes/Min)	
Terminal	Pluggable terminal blocks for conductor upto 2.5mm²	
Output relay contact	4 C/O Relays (2 for grouping + 1 for external hooter + 1 for Ring back sequence)	
Relay Contact rating	NO– 5A / NC– 3A @250V AC & NO– 5A / NC– 3A @30V DC (resistive) , (Relay Actuation time 130ms after signal detection.)	

Audible output	90 dB from 10 cm Distance (inbuilt Buzzer) Buzzer Functionality can be enable or Disable by using Mute Key. Default Setting : Buzzer Functionality is Enable. To Disable, Press Mute Key continuously for 5 Sec, buzzer will beep for three times to indicate buzzer is disabled. To Enable, Press Mute key continuously for 5 Sec, buzzer will beep for two times to indicatebuzzer is enabled.
Facia type	Individual window lens, replaceable from front.
Alarm Sequences	As per ISA standard (Field configurable) 1. Manual Reset (M-1) 2. Auto Reset (A-1) 3. Ring Back (R-1-12) 4. Auto Reset with No-lock(A-1-4) 5. Manual reset first out with no subsequent alarm flashing and silence push button (F2M-1) 6. Auto reset first out with no subsequent alarm flashing and silence push button (F2A-1)
Push button controls	Integral Push buttons for Test, Mute, Acknowledge and Reset functions. Provision of output connections for remote access of push buttons.
Communication Port	Computer interface with RS485 Modbus RTU protocol.
Operating Temperature	-10°C to + 55°C
Storage Temperature	-15°C to + 60°C
Humidity	95% R.H.
Mounting Type	Panel Mounting

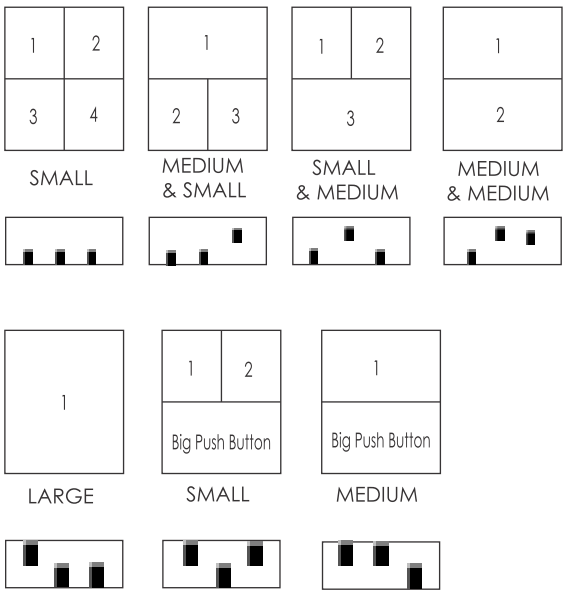
EMI/EMC Compliance:

Product Variant	**90V-270V AC/DC**	**18-60 VDC**
Harmonic Current Emissions	IEC 61000-3-2	
ESD	IEC 61000-4-2 Level II	
Radiated Susceptibility	IEC 61000-4-3 Level III	
Electrical Fast Transient	IEC 61000-4-4 Level III Power Supply and Input Signal with external Supply IEC 61000-4-4 Level III (Capacitive coupled on input Signal and Remote Keys with Internal 12V supply) IEC 61000-4-4,Level II (Capacitive coupled on Communication)	
Surge	IEC 61000-4-5 Level IV(Power Supply and Input Signal with external supply)	Level II
Conducted Susceptibility	IEC 61000-4-6 Level III	
Voltage Dips and interruptions(AC)	IEC 61000-4-11 All Level Pass	IEC 61000-4-29
Conducted Emission	CISPR 11 / CISPR 14-1 Class-A	
Radiated Emission	CISPR 11 / CISPR 14-1 Class-A	
Safety Compliance		
Test Voltage between I/P and O/P	IEC 60255-5,2.5KV,50Hz,1 Min	
Impulse Voltage between I/P and O/P	IEC 60255-5, 4KV,1.2/50us,0.5J	
Single Fault Test	IEC 61010-1	
Insulation Resistance	UL 508 >50 KΩ	
Leakage Current	UL 508 <3.5 mA	
Degree of protection	Front Panel IP40,Rear Panel IP20	
Pollution Degree	II	

Environmental Compliance :	
Cold Heat	IEC 60068-2-1
Dry Heat	IEC 60068-2-2
Vibration	IEC 60068-2-6, 10 to 55 Hz



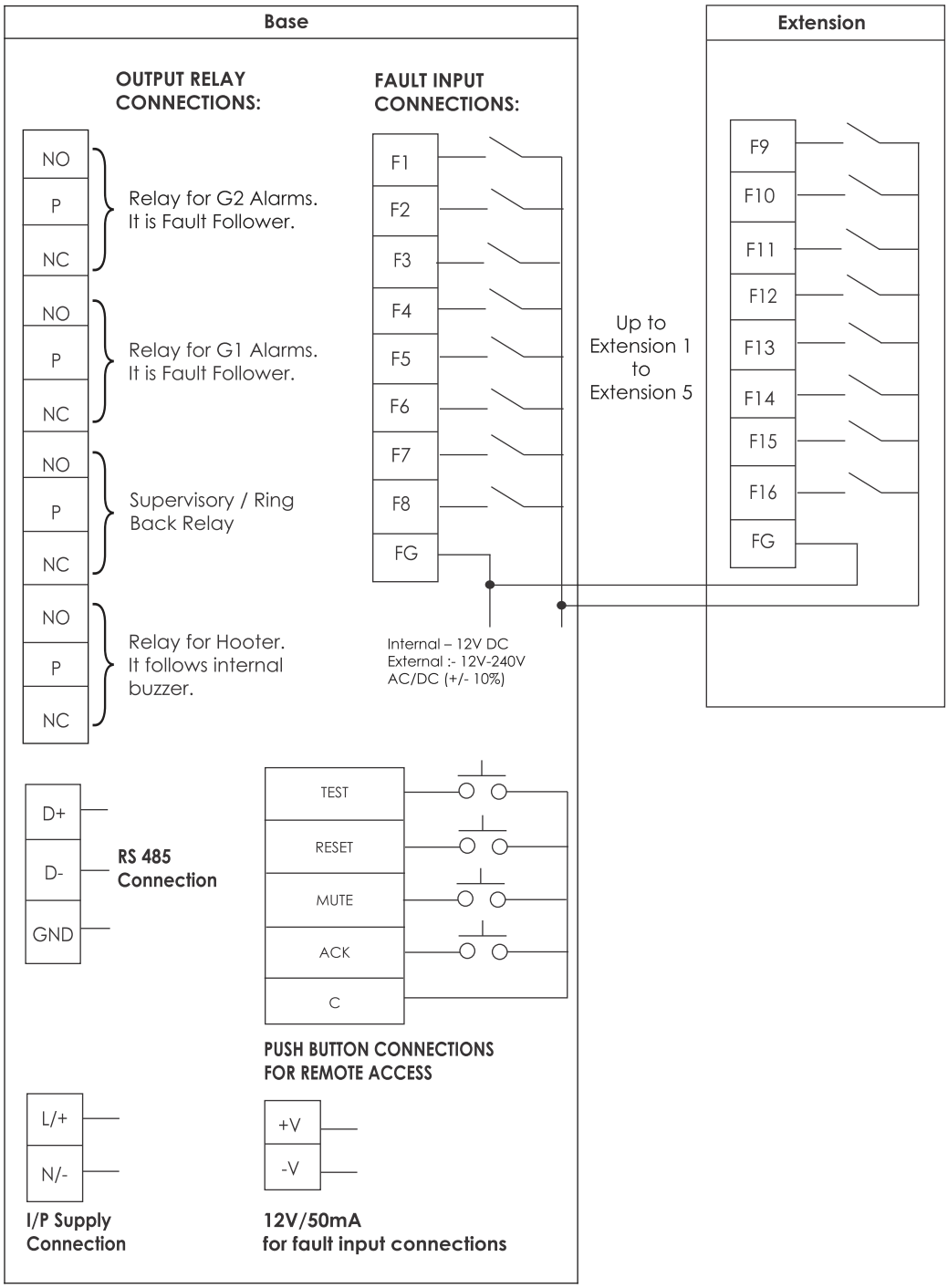
DIP S/W SETTING FOR CELL TO CONFIGURE THE WINDOW SIZE :



Note : *Switch setting applicable to both Upper and Lower Cell ,If invalid configuration is set, then device will enter in error mode. Last two configurations are valid for 'Base' only.*

Incase of any query, please write us at service@gicindia.com
Or visit www.gicindia.com

CONNECTION DIAGRAM:



STANDARD ALARM SEQUENCES : (AS PER ISA STANDARD):

Alarm annunciators can be configured to operate as per one of the following Standard sequences.

1. MANUAL RESET: (ISA M-1)

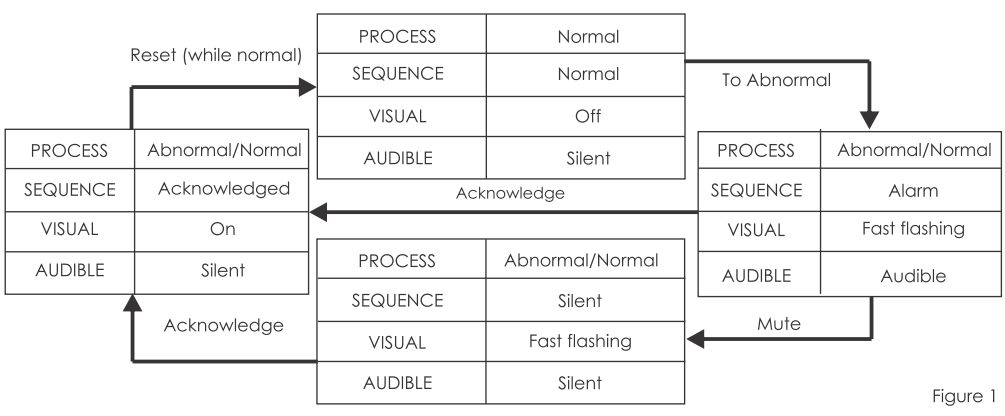


Figure 1

CONNECTION DIAGRAM:

2. AUTO RESET: (ISA A-1)

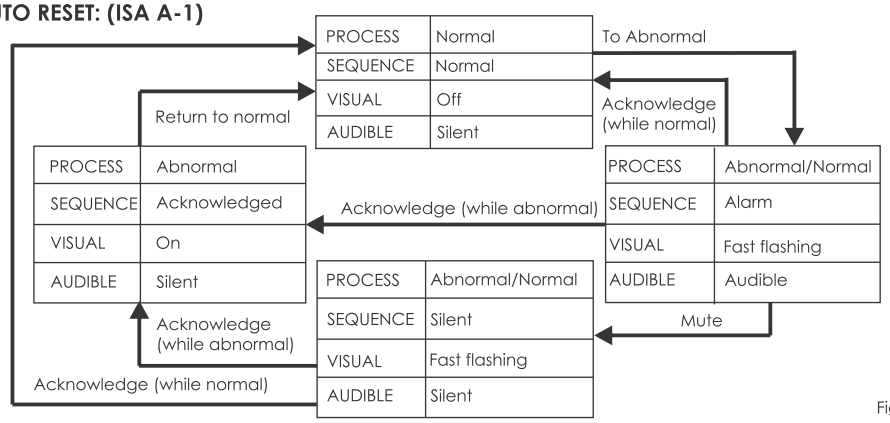


Figure 2

3. AUTO RESET WITH NO LOCK IN: (ISA A-1-4)

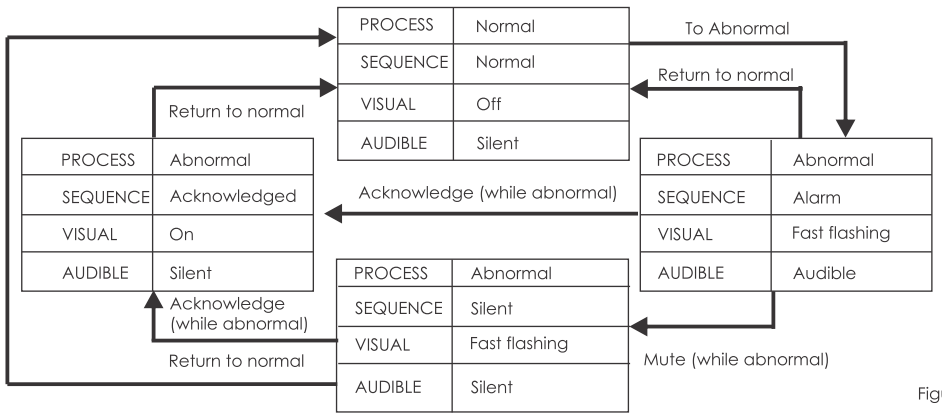


Figure 3

Note: Ring back relay will work as Supervisory relay (always ON) for all following standard sequences except, Ring back sequence - For ring back sequence Ring back relay will act as per the Ring back sequence functionality.

4. RING BACK: (ISA R-1-12)

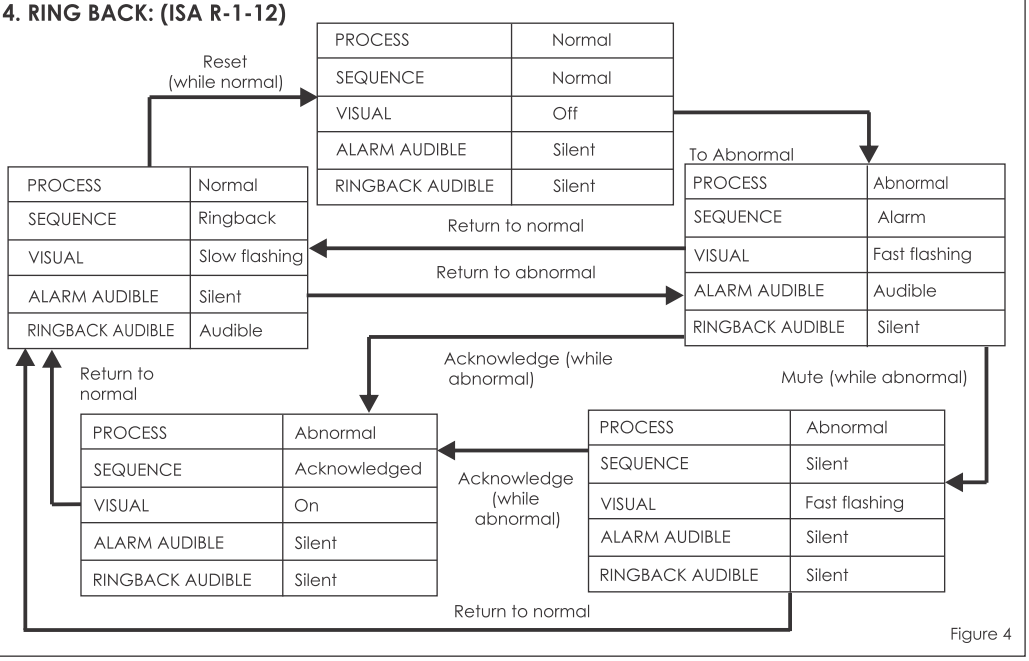


Figure 4

5. MANUAL RESET FIRST OUT WITH NO SUBSEQUENT ALARM FLASHING AND SILENCE PUSH BUTTON: (ISA F2M-1)

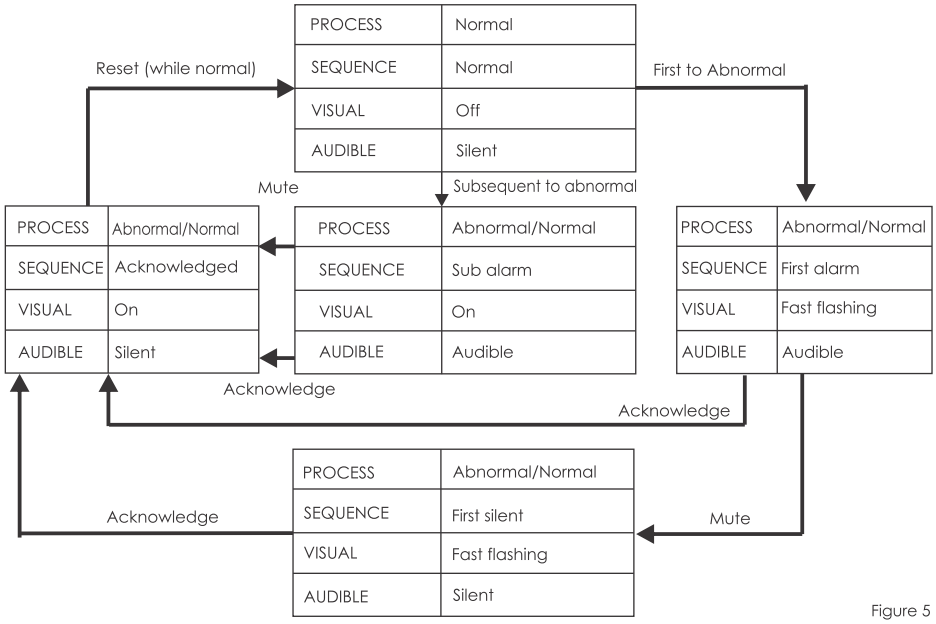


Figure 5

6. AUTO RESET FIRST OUT WITH NO SUBSEQUENT ALARM FLASHING AND SILENCE PUSH BUTTON : (ISA F2A-1)

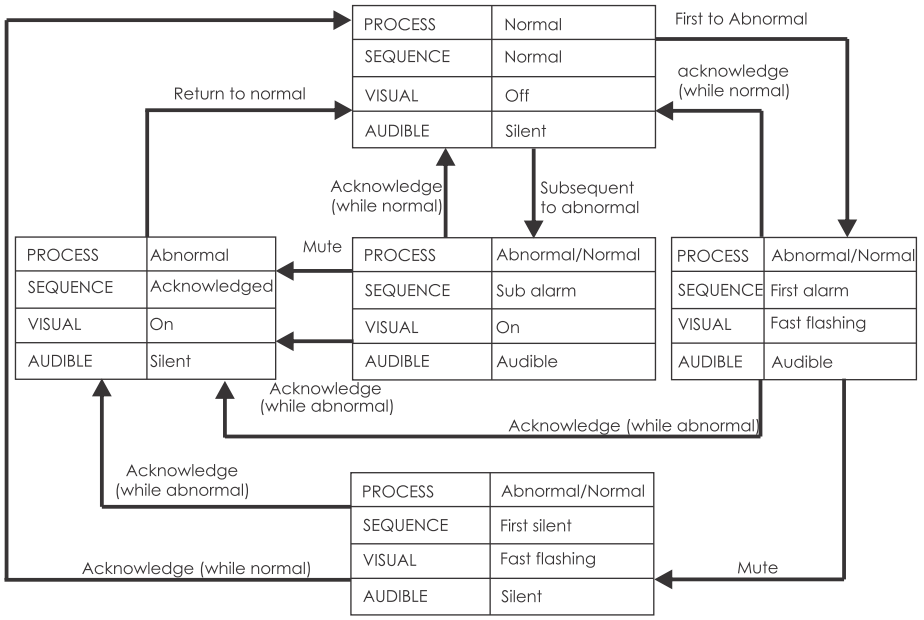


Figure 6

CAUTIONS :

1. Fault input connections can be done using internal or external supply source. Do not make internal and external source ground short/common.
2. Use internal 12V of product, only for fault input wiring. Do not connect any other externalload to it.
3. While making fault input connections, it must be ensured that fault number matches with window number and corresponding film legend.
4. Do not connect power supply to RS-485 D+ and D- terminals
5. Ensure that fuse cap is properly tightened.

NOTE:

1. The technical information provided in this document is correct at the time of going to press.
2. Product innovation being a continuous process, we reserve the right to alter the specifications without any prior notice.
3. We recommend qualified persons to install the Alarm Annunciator device.
4. Device has to reset for save configuration setting.

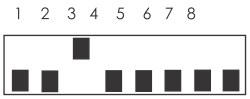
DIP SWITCH SETTINGS ON REAR SIDE:

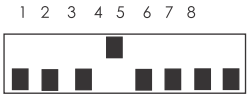
To configure annunciator as per requirement, Please refer following table, which shows all DIP switches and its position meaning:

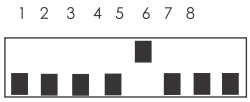
<table>
<tr><th>DIP SWITCH</th><th>SETTING</th><th>FUNCTION</th></tr>
<tr><td>For NO / NC configuration of Fault contact</td><td>
</td><td>Each individual fault input can be selected as NO or NC based on DIP switch position. If any of the DIP S/W is set upward then it is selected as NC fault contact and if it is set downward then it is selected as NO fault contact.
*NO faults, normally fault is absent, and if fault is present, then alarm will set
*NC faults, normally fault is present, and if fault is absent, then alarm will set.</td></tr>
<tr><td>To configure Fault to Group 1 or Group 2</td><td>
</td><td>Each individual fault can be assigned to Group 1 or Group 2 based on DIP switch position. If any of the DIP S/W is set upward then it is selected as Group 2 alarm and if it is set downward then it is selected as Group 1 alarm.</td></tr>
<tr><td rowspan="6">To configure alarm sequences

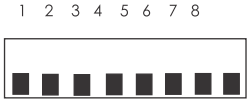
Note: Any other DIP switch combination except aside will be considered as Auto reset with no lock in (A-1-4).</td><td>

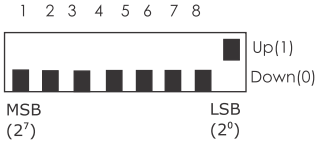
Refer Figure 1</td><td>Manual Reset (M-1)</td></tr>
<tr><td>

Refer Figure 2</td><td>Auto Reset (A-1)</td></tr>
<tr><td> 

Refer Figure 4</td><td>Ring Back (R-1-12)</td></tr>
<tr><td> 

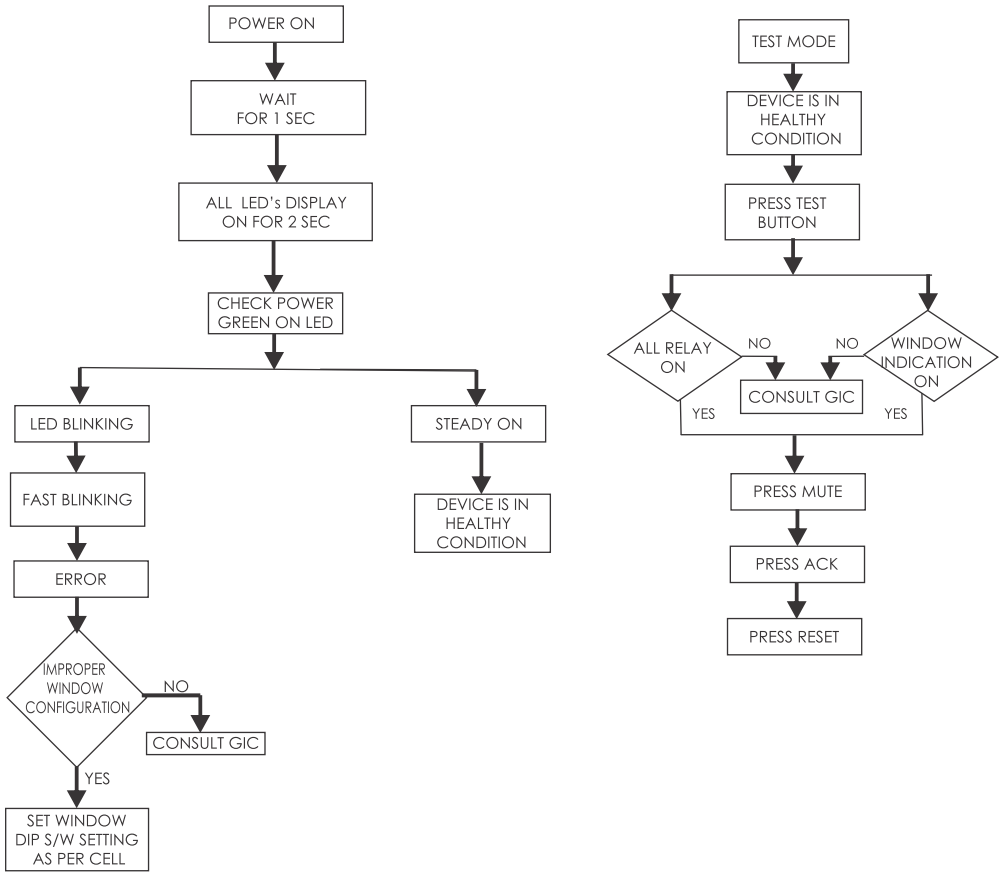
Refer Figure 5</td><td>Manual reset first out with no subsequent alarm flashing and silence push button (F2M-1)</td></tr>
<tr><td> 

Refer Figure 6</td><td>Auto reset first out with no subsequent alarm flashing and silence push button (F2A-1)</td></tr>
<tr><td> 

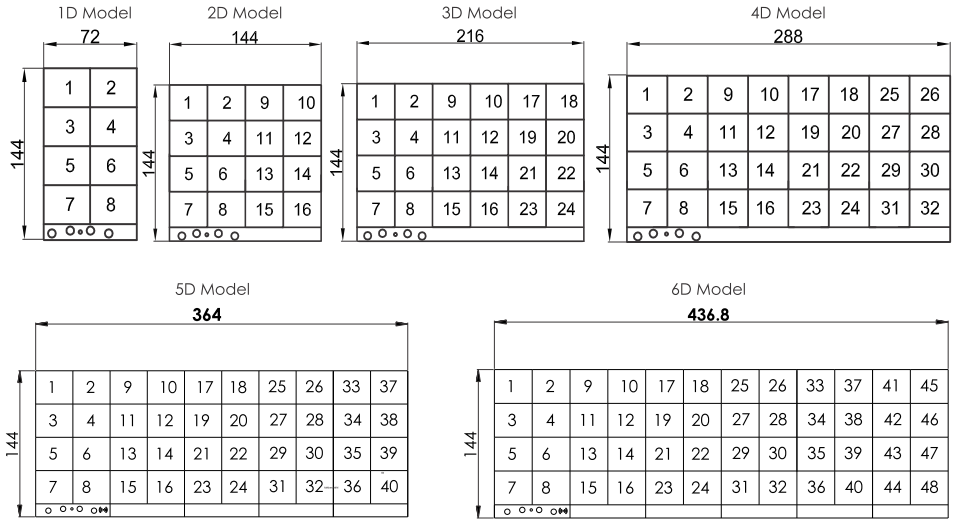
Refer Figure 3</td><td>Auto Reset with No lock-in (A-1-4)</td></tr>
<tr><td>To select device id for RS485 comm.</td><td> 

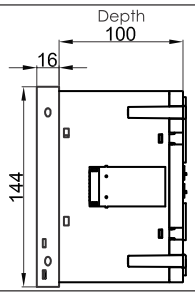
Refer Above DIP Switch setting shown for Device ID 1</td><td>Device id can be assigned from 1 to 247. Device ID is represented in binary information with respect to switch position. For example,
<table><tr><th>Device ID</th><th>Switch Setting</th></tr><tr><td>1</td><td>00000001</td></tr><tr><td>15</td><td>00001111</td></tr><tr><td>225</td><td>11100001</td></tr></table></td></tr>
</table>

Testing Flow Chart :



MOUNTING DIMENSIONS (mm):





Window Size- Large
68.8 X 63.3 mm

1
2

Window Size- Medium
68.8 X 31.55 mm

1
2
3
4

Window Size- Small
34.3 X 31.55 mm

1	2
3	4
5	6
7	8

NOTE: Window numbering always starts from left to right. In case of 4D product, from front side, window numbering starts from extreme left top and ends at extreme right bottom.

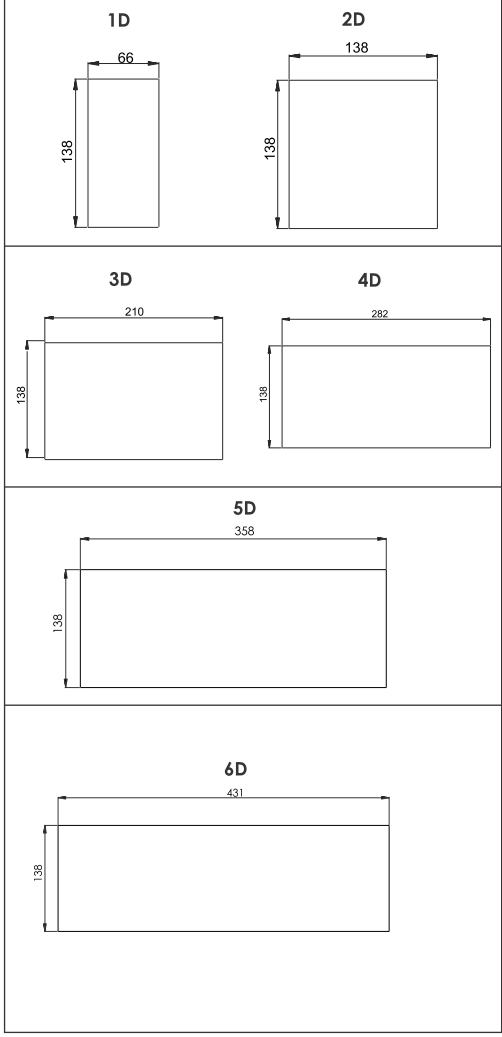
Weight with box (approx.):	1D= 580 grams, 2D= 950 grams, 3D= 1320 grams, 4D= 1690 grams 5D=2060, 6D=2430

TERMINAL CONNECTION DETAILS:

For Output Relay, Fault Input, Remote Keys, Power Supply Connection: AWG 28 to 12, Ph1- Ø3.5mm, Torque 0.5Nm(4.5lb.in)

For Internal 12V supply, RS485 Connection: AWG 28 to 16, Flat-Ø 2.5mm, Torque 0.2Nm(1.77lb.in)

PANEL CUTOUT DIMENSION(mm):



MODBUS MEMORY MAP

MODBUS PARAMETER SETTINGS:

DEFAULT SETTINGS	Baud rate – 9600 bps	Parity – None	Stop bit -1

User can change modbus settings through modbus query by writing the data into holding registers as follows:

HOLDING REGISTERS USED FOR MODBUS PARAMETER SETTING :
(Function codes : 03 – Read holding register , 06 – Write single holding register ,16 – Write multiple holding registers)

SR. NO.	ACTION	OPERATION TYPE	REGISTER NAME	NO. OF REGISTERS	ADDRESS	DATA VALUE		REMARK
						MIN	MAX	
1	Baud rate setting	Read / Write	Baud rate	1	40401	1	8	This query is used to read or change the baud rate setting as per following data values.1-1200, 2-2400, 3-4800, 4-9600(default), 5-19200, 6-38400, 7-57600, 8-115200.
2	Parity setting	Read / Write	Parity	1	40402	0	2	This query is used to read or change the parity setting as per following data values. 0-None (default), 1-Even, 2-Odd.
3	Stop Bit setting	Read / Write	Stop Bit	1	40403	0	1	This query is used to read or change the stop bit setting as per following data values.0-1 stop bit (default), 1 - 2 stop bits.

NOTE:

1. Press RESET key on device continuously for 10 sec to set default Baud rate 9600
2. Whenever user will change the settings, device will reply 'OK' with previous baud rate / parity / stop bit and then only new settings will be applied.
3. It is necessary to add 120 Ω termination resistors for long distance communication.
4. For baud rates 57600 and 115200, the device will communicate upto 300 meter distance.

COILS USED IN MODBUS COMMUNICATION: (Function codes : 01 – Read coil , 05 – Write single coils ,15 – Write multiple coils

SR. NO.	ACTION	OPERATION TYPE	COIL NAME	NO. OF COILS	ADDRESS		DATA VALUE		REMARK
					START	END	MIN	MAX	
1	Fault input through modbus query	Read / Write	Modbus fault input coil 1 ------up to------ Modbus fault input coil 48	48	1	48	0	1	0 – Normal , 1 – Abnormal. Faults can be given through modbus query instead of physical connections. When modbus query is being used to write the faults then do not make connections to fault input terminals.
2	Physical fault input status	Read	Physical fault input coil 1 ------up to------ Physical fault input coil 48	48	201	248	0	1	0 – Normal , 1 – Abnormal. This query is used to check the status of fault occurred through physical connections.
3	Maintained (Latched) fault input status	Read	Maintained fault input coil 1 ------up to------ Maintained fault input coil 48	48	401	448	0	1	0 – Normal , 1 – Abnormal. This query is used to check the status of maintainedfaults.When fault is occurred and recovered, it remains in maintained state till sequence return to normal state.
4	NO / NC configuration status	Read	Fault input NO/NC coil 1 ------up to------ Fault input NO/NC coil 48	48	601	648	0	1	0 – NO , 1 – NC. This query is used to check which fault input is configured in NO / NC as per DIP switch setting.
5	Group relay configuration status	Read	Fault input Group coil 1 ------up to------ Fault input Group coil 48	48	801	848	0	1	0 – Group 1 , 1 – Group 2. This query is used to check which fault input is assigned to which group relay as per DIP switch setting.
6	Relay ON/OFF status	Read	Hooter relay	4	1001		0	1	0 – Relay OFF (De-energized) , 1 – Relay ON (Energized). This query is used to check ON/OFF status of respective output Relay.
			Ring back relay		1002				
			Group 1 relay		1003				
			Group 2 relay		1004				
7	Buzzer Enable /Disable Feature	Read / Write	Buzzer	1	1201		0	1	0 – Buzzer OFF , 1 – Buzzer ON

NOTE:

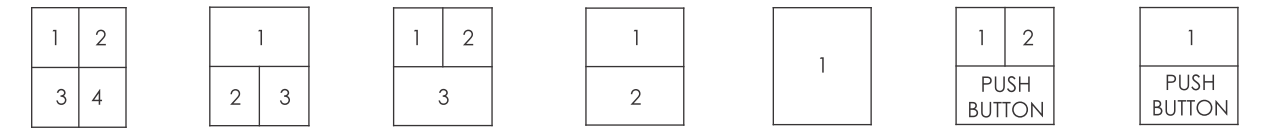
1. If coil address is greater than active inputs ,then "illegal data address" error will come.
2. After power reset , faults which are set through modbus query return to normal state.
3. Fault inputs given through the modbus query can be cleared only through the modbus.4) For Modbus faults, NO/NC configuration will not be applicable.

HOLDING REGISTERS USED IN MODBUS COMMUNICATION:
(Function codes : 03 – Read holding register, 06 – Write single holding register, 16 – Write multiple holding registers)

SR. NO.	ACTION	OPERATION TYPE	REGISTER NAME	NO. OF REGISTERS	ADDRESS		DATA VALUE		REMARK
					START	END	MIN	MAX	
1	Windows configuration setting	Read	Extension 6 windows configuration register ------up to------ Extension 2 windows configuration register	6	40001	40006	0x0000	0x0044	This query is used to check which window configuration is selected on base or extension as per dip switch setting.In data value,lower byte lower nibble indicates lower cell configuration and lower byte higher nibble indicates upper cell configuration. For the details of the data values refer the below Example.
			Base windows configuration register				0x0000	0x0046	
2	Sequence selection setting	Read	Sequence selection register	1	40101		0	5	This query is used to check which sequence is selected as per dip switch setting. Data value indicates sequence as below , 0 – Auto reset with no lock-in (A-1-4) 1 – Manual reset with silence push button (M-1) 2 – Auto reset with silence push button (A-1) 3 – Ring back with silence push button and automatic momentary ring back (R-1-12) 4 – Manual reset first out with no subsequent alarm flashing gand silence push button(F2M-1) 5 – Auto reset first out with no subsequent alarm flashing and silence push button(F2A-1)
3	Push button (keys)	Read / Write	Key pad register	1	40201		1	8	This query is used to operate the keys through modbus or to read the status of which key is pressed. 0 – No key, 1 – Reset key , 2 – Mute key, 4 – Acknowledge key, 8 – Test key.
4	Device information	Read	Number of Input Cards	4	40301	40304	1	6	This query is used to know how many fault input cards, LED cards and number of active inputs , device consist of. Data value indicates error information as below,0 – No error , 1 – Wrong window configuration, 2 – Number of windows are more than number of fault inputs, 4 – Data flash write error, 8 – Data flash read error.
			Number of Output Cards				1	6	
			Number of Active Inputs				2	48	
			Device Error Information				0	8	

Example:

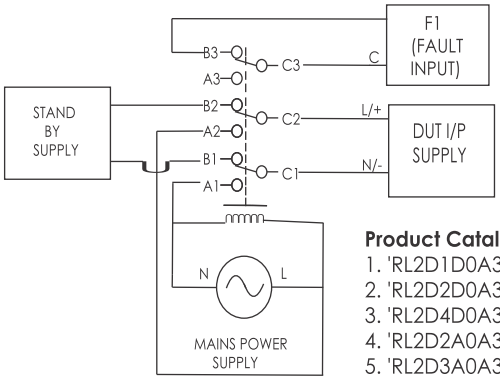
1. If the Device is in Error Mode (Healthy LED will be Blinking), then only the Device Error information Holding Register (40304) will have valid data and other Registers, coils will have the invalid data. Window Configuration of Lower / Upper cell data values meaning (At address 40001 to 40004)



1. If the data value at address 40001(Consider for 1D) is 0x0036 then it means upper cell contains 2 medium windows and lower cell contains 1 medium with big push button.
2. If the data value at address 40002(Consider for 2D) is 0x0004 then it means upper cell contains 4 small windows and lower cell contains 1 large window.

NOTE:
1) Minimum delay between two queries should be greater than 100 msec.
2) The response time out should be more than 200 msec.
3)The Scan rate Should be set 100ms for immediate response.
4)Recommended to use shielded cable for communication.

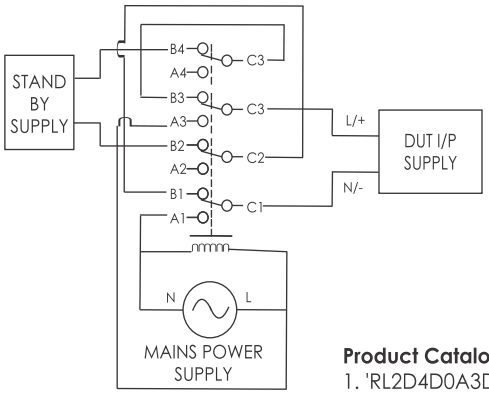
SUPPLY FAIL ANNUNCIATION ACCESSORY :



Product Catalog Number

1. 'RL2D1D0A3D' : 24VDC
2. 'RL2D2D0A3D' : 110VDC
3. 'RL2D4D0A3D' : 220VDC
4. 'RL2D2A0A3D' : 110VAC
5. 'RL2D3A0A3D' : 240VAC

DUAL POWER SOURCE SUPPLY ACCESSORY:



Product Catalog Number

1. 'RL2D4D0A3DD': 220VDC

Following Features are available:

1.Standby supply Switch over.
2.Mains Supply Fail annunciation with Standby Supply Switch over.
3.Relays are of different ranges: 24VDC, 48VDC, 110VDC, 240VAC, 110VAC, 220VDC.

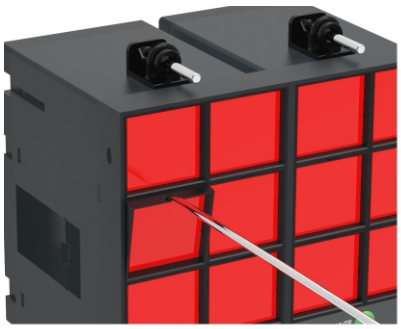
PRODUCT ORDERING CODE:

A	U	1D	8	S	P

- P
  - Blank : Small push button + Slow Scan time(100ms) (Fault I/P voltage external 12 to 265VAC/DC & 12VDC Internal) + Non-Replaceable LED PCB type
  - P : Big push button + Slow Scan time(100ms) (Fault I/P voltage external 12 to 265VAC/Dc & 12VDC Internal) + Non-Replaceable LED PCB type
  - 03 : Small push button +(Fast Scan time 10ms)(Fault I/P voltage 12V Internal) + Replaceable LED PCB
  - P3 : Big push button +(Fast Scan time 10ms) (Fault I/P voltage 12V Internal) + Replaceable LED PCB type
- S
  - S : Small 34(W)x31(H) Window Size
  - M : Medium 68(W)x 31(H) Window Size
  - L : Large 68(W)x 63(H) Window Size
  - I : Intermix Window Size
- 8
  - 1D - 2.....8 No of Windows
  - 2D - 4.....14 No of Windows
  - 3D - 6.....24 No of Windows
  - 4D - 8.....32 No of Windows
  - 5D - 10....40 No of Windows
  - 6D - 12....48 No of Windows
- 1D
  - 1D/ 2D/ 3D/ 4D/ 5D/ 6D
- U
  - U - Universal Supply 90-270 VAC/DC
  - D - DC Supply 18-60 VDC
- A
  - A - Alarm Annunciator

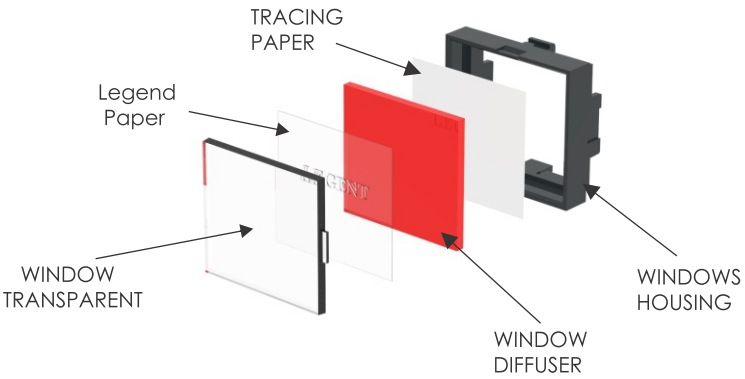
Kindly refer following steps to add “Legends”:

Step 1:Remove ‘CELL’



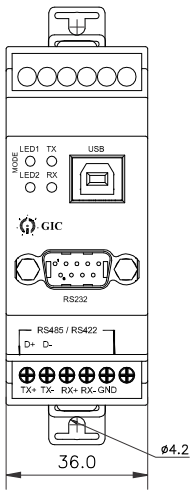
Step 2: Remove ‘window transparent’

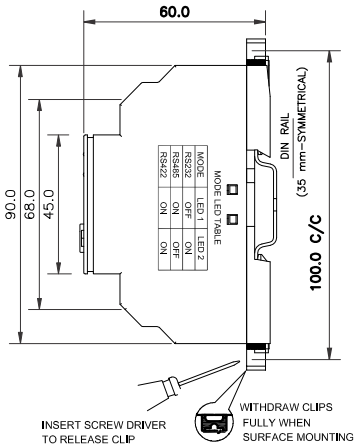
Step 3:Add ‘Legend’ Paper



Note: Legend templates are available on our website: www.gicindia.com

USB to RS232/RS485(2W)/RS422(4W) ACCESSORY:





Baud rate (bps)	RS-422/485 Transmission Distance (m)	External Terminator 120 Ohm *
9600	1200	Not needed
19200	1200	Both side
38400	600	Both side
57600	300	Both side
115200	150	Both side

NOTE:
This has to be connected between terminal “D+” & “D-” in case of USB to RS485 communication, if required.
Product Catalog Number'28A11A0'.

NOTE:
E-Waste Regulatory notice: Kindly treat, recycle or dispose of this equipment in an environmentally sound manner after End of Life, as per WEEE (Waste Electrical and Electronic Equipment) regulations;or hand it over to General Industrial Controls Pvt. Ltd, through website https://www.gicindia.com/get-in-touch