

LEGEND PLUS SERIES **MODEL LGPB - Four Preset Batch/Counter/Rate Indicator** **MODEL LGPM - Six Preset Counter/Rate Indicator** **MODEL LGPBF - Four Preset Foot-Inch Length Counter**



DESCRIPTION

The Legend Plus Series consists of two models that are multi-input count and rate indicators. The LGPB features process, batch, and total counting, as well as a time interval rate indicator. The four available presets can be assigned to the process counter or the rate indicator. Outputs three and four can also be assigned to the batch or total indicator. The Legend Plus foot-inch counter provides Process and Total count read-outs in feet and inches. A decimal point is used to separate the foot and inch units. All Process and Total presets are also displayed in feet and inches. The LGPM features six presets, which can be assigned to either the rate or count display.

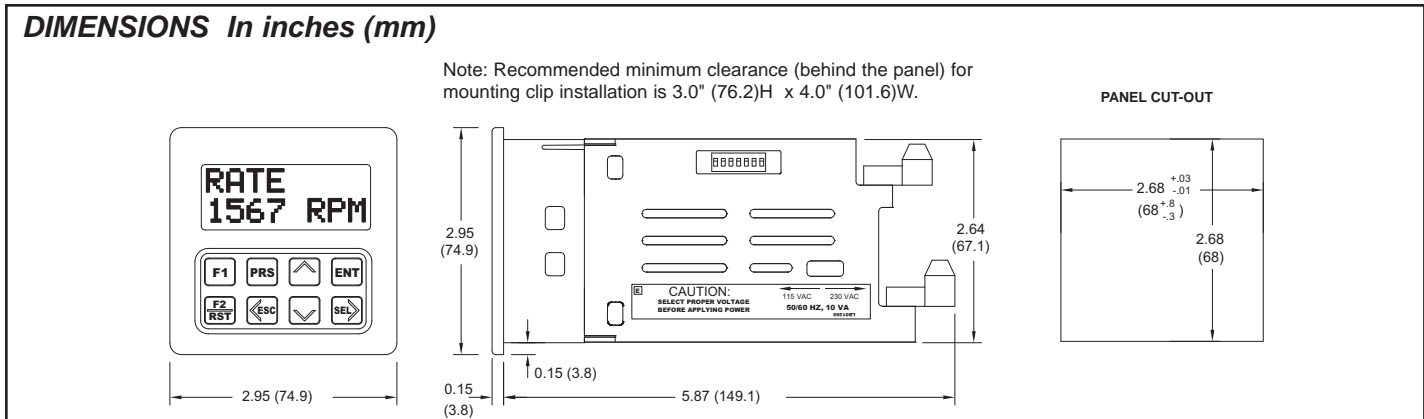
The Legend Plus has advanced features which allow the units to be more closely coupled to the application. The units feature a 2 line by 8 character alpha-numeric display, allowing the value mnemonics and programming menus to be easily read. The units are available in single or dual color display models. The four scroll-through indication displays can be programmed to show various parameters and automatically scroll, if desired. On dual color models, each indication display can be programmed for either color. The mnemonics corresponding to the main display values (RATE, PROCESS, BATCH, TOTAL) can be individually programmed and modified as desired. For example, the RATE mnemonic can be reprogrammed to display the word SPEED, so that when the rate mnemonic is to be displayed, the mnemonic SPEED is displayed instead.

Two custom display lines are available which enable the user to specify the number of digits of a value to be displayed on the line, along with any alpha-numeric prefix or suffix. This capability allows displays such as: '1000 RPM', '99999 Ft', 'PRC 9999', etc.

The Legend Plus also features messaging capabilities that can inform the user of output actions or other events that occur in a system. Up to ten messages can be programmed. Messages can be requested by an output status change, user input(s), or through serial communications. The messages can be programmed to blink, scroll, time out, and to alternately flash between message and indication display.

On dual color models, the message can be programmed to be displayed in either color. This capability is very useful in drawing the operator's attention to particular messages.

- 2X8 TRANSMISSIVE LCD, NEGATIVE IMAGE, WITH L.E.D. BACKLIGHTING
- PROGRAMMABLE DISPLAY INTENSITY
- OPTIONAL DUAL COLOR DISPLAY (Red and Green)
- FOUR USER PROGRAMMABLE INDICATION DISPLAYS WITH CUSTOMIZABLE MNEMONICS AND DISPLAY LINES
- PROGRAMMABLE MESSAGE CAPABILITIES
- ENGLISH PROGRAMMING MENUS
- RS485 OR RS232 SERIAL COMMUNICATIONS
- OPTIONAL PROGRAMMING SOFTWARE FOR PROGRAMMING MULTIPLE UNITS
- ABILITY TO LOCKOUT OPERATOR ACCESS TO PROGRAMMING PARAMETERS
- PROGRAMMABLE CONTROL INPUTS
- COUNT INPUTS ARE SWITCH SELECTABLE FOR VARIOUS SENSOR OUTPUTS
- BI-DIRECTIONAL COUNTING, UP/DOWN CONTROL
- QUADRATURE SENSING (Up to 4 times resolution)
- COUNT INHIBIT TERMINAL AVAILABLE FOR ALL COUNT MODES
- ACCEPTS COUNT RATES UP TO 15 KHz
- ALL OUTPUT(S) ASSIGNABLE TO COUNT OR RATE
- ON & OFF DELAY FOR RATE OUTPUTS
- SOLID STATE CURRENT SINKING OUTPUT(S)
- RELAY OUTPUTS (LGPB only; Field Replaceable)
- SEPARATE INPUT SCALING FOR RATE, COUNT, & TOTAL
- 115/230 VAC SWITCH SELECTABLE
- NEMA 4X/IP65 SEALED FRONT PANEL BEZEL



DESCRIPTION (Cont'd)

The program disable DIP switch, the code value, and an external user input selected for Program Disable can be utilized to provide multi-level protection against unwanted changes to data values and unit configuration.

The Legend Plus features enhanced serial communications. The serial port can be configured for connection to RS485 or RS232 devices. It can be used for data retrieval and for programming various data values.

Optional Legend Plus Programming Software for IBM® compatible PCs is available to program all the Legend configuration parameters, such as messages, count modes, etc. The software allows unit configurations to be created, uploaded, downloaded and saved to a file for rapid programming of the Legend unit.

The six programmable User Inputs can be configured to provide a variety of functions. Four user inputs are located on the upper rear terminal block and the other two inputs are front panel function keys. The User Inputs can be configured to provide functions such as:

Count Inhibit	Reset
Message Request	Message Cancellation
Output Activation	Output Deactivation
Program Disable	View/Freeze Display
Print Request	Skip Presets(outputs)

The units offer a choice of seven programmable counting modes for use in applications requiring Bi-directional, Anti-coincidence, and Quadrature counting. The count inhibit function can be utilized with all of these input response modes by programming User Input 4 for the Inhibit Count function. The input circuitry is switch selectable to accept signals from a variety of sources. In the Anti-coincidence mode both inputs are monitored simultaneously, so that no counts are missed, and the final count can be chosen as the sum or difference of the two inputs.

Rate, Process and Total displays have separate scaling and decimal point placement, for readouts in different units. The Counter Load feature enables the operator to modify the count value. This is useful when flawed material has been counted and it is necessary to adjust the count value accordingly.

The rate operates in the time interval method (1/tau) to calculate the rate value. This method insures high resolution at all input rates. Averaging can be accomplished by programming the Minimum and Maximum Update Time for the desired response. Extensive scaling capabilities allow practically any reading at very slow input rates.

The construction of the Legend Plus unit is a lightweight, high impact plastic case with a clear viewing window. The sealed front panel with silicone rubber keypad meets NEMA 4X/IP65 specifications for wash-down and/or dusty environments, when properly installed. Plug-in style terminal blocks simplify installation and wiring change-outs.

SAFETY SUMMARY

All safety related regulations, local codes and instructions that appear in the manual or on equipment must be observed to ensure personal safety and to prevent damage to either the instrument or equipment connected to it. If equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

Do not use this unit to directly command motors, valves, or other actuators not equipped with safeguards. To do so, can be potentially harmful to persons or equipment in the event of a fault to the unit.

MODEL - LGPB

The process counter is used to monitor the count within the batch. Presets 1 through 4 can be assigned to the process counter or the rate indicator. Presets 3 and 4 can also be assigned to either the batch counter or totalizer.

Presets 1 and 2 can activate relay outputs 1 and 2 respectively. Presets 3 and 4 can activate the NPN open collector outputs O3-SNK and O4-SNK respectively.

MODEL - LGPM

The Multi Preset unit has 6 presets which can control NPN open collector outputs O1-SNK to O6-SNK respectively. Presets 1 through 6 can be assigned to either the rate or count display.

STANDARD INDICATION DISPLAYS & PRESETS FOR EACH MODEL	
LGPB & LGPBF	LGPM
RATE	RATE
PEAK	PEAK
VALLEY	VALLEY
PROCESS	COUNT
BATCH	(6 Presets)
TOTAL	
(4 Presets)	

SPECIFICATIONS

- DISPLAY:** 2x8, 0.3" (7 mm) high characters, negative image transmissive LCD, with Single (green or red) or Dual Color (green and red) LED backlighting.
- POWER:**
AC Operation: 115/230 VAC ±10%, 50/60 Hz, 10 VA, switch selectable.
DC Operation: +12 VDC ±20% @ 250 mA max.
- MEMORY:** Non-volatile memory retains all programming information. Count and Preset values are written to non-volatile memory when power is interrupted. All other programming parameters are written to memory when programming mode is exited. If power is removed while in the programming menu's the parameters are stored to previously saved settings.
Data Retention: 10 yr. min.
Message/Mnemonics Memory:
 792 (LGPB) / 804 (LGPM) bytes available (with factory settings loaded).
- SENSOR POWER:** +12 VDC ±25% @ 100 mA.
- INPUTS A and B:** DIP Switch selectable to accept count pulses from a variety of sources including switch contacts, outputs from CMOS or TTL circuits, magnetic pickups and all standard RLC sensors.
LOGIC: Input trigger levels $V_{IL} = 1.5 V_{MAX}$; $V_{IH} = 3.75 V_{MIN}$.
Current sinking: Internal 7.8 KΩ pull up to +12 VDC, $I_{MAX} = 1.9$ mA.
Current sourcing: Internal 3.9 KΩ pull-down, 7.3 mA_{MAX} @ 28 VDC.
Debounce: Damping capacitor provided for switch contact bounce. Limits count speed to 50 Hz and input pulse widths to 10 msec min.

MAGNETIC PICKUP:

Sensitivity: 200 mV peak.

Hysteresis: 100 mV.

Input impedance: 3.9 KΩ @ 60 Hz.

Maximum input voltage: ±50 Vp

Note: For magnetic pickup input, the sink/source DIP switch must be in the SRC position.

- RATE ACCURACY:** ±0.01%
- RATE MINIMUM INPUT FREQUENCY:** 0.01Hz.
- MAXIMUM COUNT RATE IN KHZ:**

MODEL	CNT + DIR		QUAD			ADD/ADD	ADD/SUB
	X1	X2	X1	X2	X4	X1*	X1*
LGPB (Batch)	15	7	7	5.5	3	14	7
LGPM (Six Preset)	13	6	6	5	2.5	12	6
LGPBF (Foot-Inch)	15	7	7	5.5	3	15	7

Notes:

- Maximum count rates given are for Process counter set for Auto reset with the auto cycle preset set to an equivalent of 100 count pulses or greater. With auto cycle presets less than 100 counts the maximum count rates may be lower. The actual Preset value for 100 count pulses, with Count SF=0.5000 and Count Scale Multiplier=X1, would be 50.*
- Maximum count rate given for X2 & X4 count modes are given for 50% duty cycle signals and Quad signals with 90° phase shift.*
**Inputs A & B count rates summed.*
- MAXIMUM COUNT CAPACITY:**
Process or Count: 9 digits internal (non-scaled), 6 digits displayable (scaled)
Batch Count: 6 digits
Total Count: 11 digits internal (non-scaled), 8 digits displayable (scaled)
- CONTROL INPUTS:**
Programmable user inputs (4):
USR INP 1 to 3: Internal 10 KΩ pull-up to +5 VDC, $V_{IL} = 1.5 V_{MAX}$; $V_{IH} = 3.5 V_{MIN}$, response time = 30 msec typical, 100 msec max. (*count rate dependent*).
USR INP 4/INH: Internal 10 KΩ pull-up to +5 VDC, $V_{IL} = 1.5 V_{MAX}$; $V_{IH} = 3.0 V_{MIN}$, response time = 30 msec typical, 100 msec max. (*count rate dependent*).
INHIBIT Response time = 50 μsec max.
User Inputs Programmed for Binary Message Request: Debounce = 100 msec. (*Binary message request inputs must be stable for 100 msec before a message is requested*).
- SERIAL COMMUNICATIONS:**
Type: Jumper selectable RS485 or RS232.
 Can connect up to 32 units when using RS485 interface.
Baud Rate: Programmable from 1200 to 9600.
Maximum Addresses: Programmable from 00 to 99. (Actual number on a line is limited by hardware specifications)
Transmit Delay: Programmable for 0.002 or 0.100 second.
Data Format: 10 Bit Frame; 1 start bit, 7 or 8 data bits, 1 or no parity bit, and 1 stop bit. Parity is programmable for ODD (7 data bits), EVEN (7 data bits), or NO Parity (8 data bits).
- OUTPUT(S):**
Solid-State: Current sinking NPN open collector transistor.
 $V_{CE} = 1.1 V_{SAT}$ @ 100 mA max. $V_{OH} = 30$ VDC max.
 (Internal Zener Diode Protection).

12. **OUTPUT(S):** (Cont'd)

Relay(s): Mounted on field-replaceable P.C. board. Form C contacts rated at 5 amps @ 120 VAC/240 VAC or 28 VDC (resistive load), 1/8 H.P. @ 120 VAC (inductive load). The operate time is 5 msec nominal and the release time is 3 msec nominal.

Programmable Timed Output(s): Programmable time ranges from 0.01 to 99.99 seconds, ±0.05% - 11 msec max.

Output Time Required To Request Message: 50 msec.

13. **ENVIRONMENTAL CONDITIONS:**

Operating Temperature: 0 to 50°C

Storage Temperature: -40 to 70°C

Operating and Storage Humidity: 85% max. (non-condensing) from 0°C to 50°C.

Vibration According to IEC 68-2-6: 5 to 150 Hz, in X, Y, Z direction for 1.5 hours, 2 g.

Shock According to IEC 68-2-27: Operational 20 g (10 g relay), 11 msec in 3 directions.

Altitude: Up to 2000 meters

14. **CERTIFICATIONS AND COMPLIANCES:**

IEC 61010- 1, EN 61010- 1: Safety requirements for electrical equipment for measurement, control, and laboratory use, Part 1.

IP65 Enclosure rating (Face only), IEC 529

Type 4X Indoor Enclosure rating (Face only), UL50

ELECTROMAGNETIC COMPATIBILITY

Immunity to EN 50082-2

Electrostatic discharge	EN 61000-4-2	Level 2; 4 Kv contact Level 3; 8 Kv air
Electromagnetic RF fields	EN 61000-4-3	Level 3; 10 V/m 80 MHz - 1 GHz
Fast transients (burst)	EN 61000-4-4	Level 4; 2 Kv I/O ¹ Level 3; 2 Kv power
RF conducted interference	EN 61000-4-6	Level 3; 10 V/rms ¹ 150 KHz - 80 MHz
Power frequency magnetic fields	EN 61000-4-8	Level 4; 30 A/m

Emissions to EN 50081-2

RF interference	EN 55011	Enclosure class A Power mains class A
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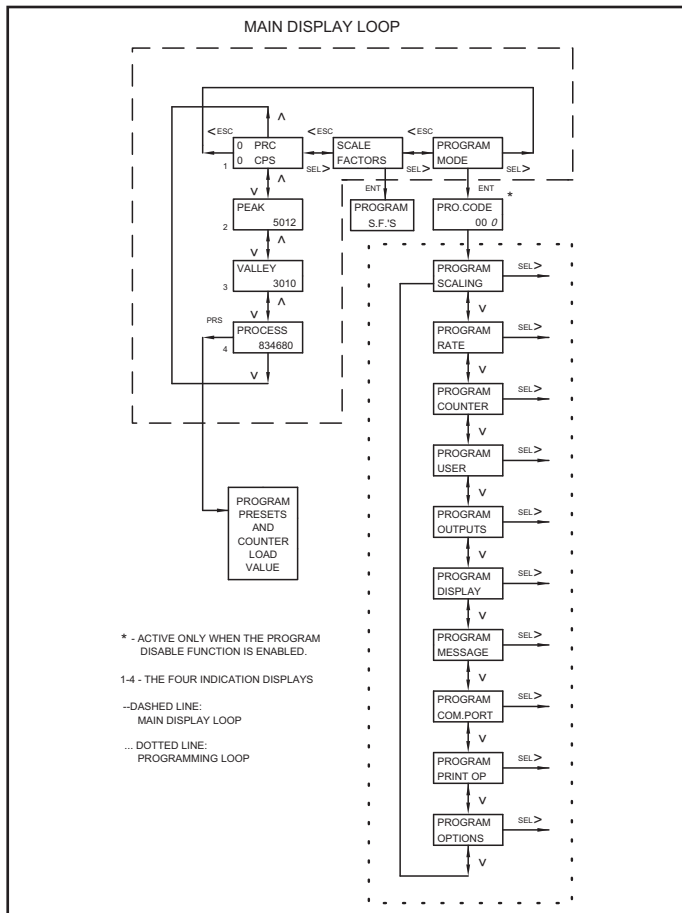
Note:

1. When the unit is DC powered from terminal TBA pin 5 (common) and terminal TBA pin 3 (DC OUT/ IN) a power line filter was installed, RLC #LFIL0000 or equivalent, so as not to impair the function of the unit.

Refer to the EMC Installation Guidelines section of the manual for additional information.

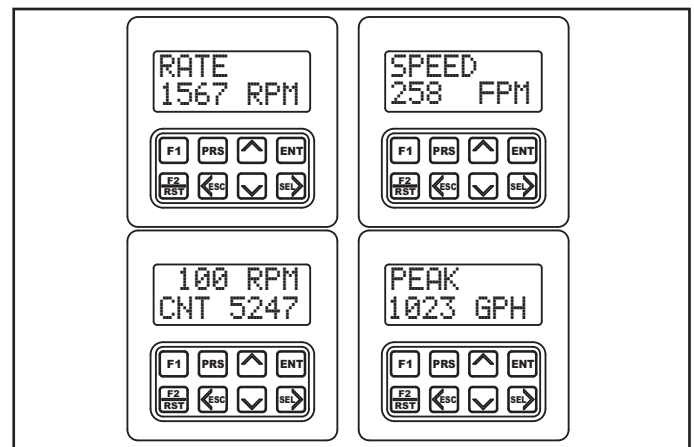
15. **CONSTRUCTION:** High impact plastic case with clear viewing window. The front panel meets NEMA 4X/IP65 requirements for indoor use when properly installed. Installation Category II, Pollution Degree 2. (Panel gasket, mounting clips, nut fasteners and screws included with unit.)

16. **WEIGHT:** 1.5 lbs. (0.68 Kg)



PROGRAMMING

The Legend Plus Series provides an easy to use, menu driven programming interface. The English prompts, the front panel keypad, and the flashing display aid the operator during programming. In the normal operating mode, the main display loop allows the user to scroll through the four programmable indication displays using the direction keys. From the main loop, presets and scale factors can be accessed directly. All other parameters are accessed through the programming loop, which can be set to require an access code number to enter the loop. In the programming loop, parameters can be viewed or changed and the operator can exit anywhere in the loop. The drawing above shows the main display loop and part of the programming loop of a Legend Plus unit. Also shown above right are four different views of the indication displays.



PROGRAMMABLE FUNCTIONS

PRESET(S)

Ranges from -99999 to 999999
Counter Load ranges from -99999 to 999999

SCALE FACTORS (RATE, COUNT & TOTAL)

Ranges from 0.0001 to 5.9999. The internal count value is multiplied by the count scale factor and the count scale multiplier to provide the process count display value. The total count is scaled by the count scale factor and the count scale multiplier, and is additionally scaled by the total scale factor. The number of negative edges is multiplied by the rate scale factor, the rate scale multiplier, and the rate conversion factor to calculate the rate value.

COUNT SCALE MULTIPLIER

Multiplies the contents of the 9-digit internal counter or the 11-digit internal totalizer by a factor of 1, 0.1, 0.01 or 0.001 to view the desired number of significant digits on the 6-digit Counter display or the 8-digit Totalizer display.

DECIMAL POINT

Separate decimal point location for Count, Rate, and Total displays.

0
0.0
0.00
0.000
0.0000
0.00000

RATE SCALE MULTIPLIERS

Multiplies the contents of the actual internal rate, pulses per second (PPS), by a factor of 0.01, 0.1, 1, 10, 100, or 1000 to view the desired number of significant digits on the 6-digit Rate display. The desired time units for the rate can be programmed as per Second (x1), per Minute (x60), or per Hour (x3600).

PROGRAMMABLE FUNCTIONS (Cont'd)

UPDATE TIME

The Rate Minimum and Maximum Update Times range from 0.1 to 99.9 seconds. This provides averaging capability for non-consistent pulse spacing.

Note: The maximum update time must be larger than the minimum update time.

COUNTING MODES

- Count with Direction
- Count with Direction (X2)
- Quadrature
- Quadrature (X2)
- Quadrature (X4)
- 2-Input Anti-coincidence Add/Subtract
- 2-Input Anti-coincidence Add/Add
- A separate Inhibit input is available for all count modes.

RESET MODES

- Manual Reset
- Automatic Reset at Preset
- Reset at Beginning Of Output 1
- Reset at End Of Timed Output 1
- Reset at Beginning Of Output 2
- Reset at End Of Timed Output 2
- Reset at Beginning Of Output 1 or Output 2
- Reset at End Of Timed Output 1 or Output 2

MODEL LGPB ONLY

- Reset at Beginning Of Output 3
- Reset at End Of Timed Output 3
- Reset at Beginning Of Output 4
- Reset at End Of Timed Output 4
- Reset at Beginning Of Output 3 or Output 4
- Reset at End Of Timed Output 3 or Output 4

RESET ACTION

Reset to Zero: Count display value returns to zero when reset. Output activates, if programmed, when the count equals the preset value.

Reset to Preset: Count display value returns to preset value when reset. Output assigned to the specified preset activates, if programmed, when the count equals zero.

Reset to Counter Load: Count display value returns to counter load value when reset. Output activates, if programmed, when count equals the preset value.

USER INPUTS

There are four external user inputs and two front panel Function keys that are programmable. When activated, each user input can be programmed to perform one of the following functions:

Maintained Reset or Momentary Reset:

Can reset Rate, Peak, Valley, Process*, Batch*, Total*, or Count* display values and/or any output associated with that display.

** On Models with these available display options.*

Reset Output(s):

Places the output(s) in their inactive state. (*Momentary action*)

Set Output(s):

Places the output(s) in their active state. (*Momentary action*)

View Display 1-4:

Causes the selected indication display (1, 2, 3, or 4) to be displayed and held from anywhere in the main display loop. The current display value is frozen (*not updated*) while the display is held.

Change Display:

Causes the indication display to toggle to the next indication display.

Request Message:

Requests a specific programmed message to activate.

Clear Message:

Causes the displayed message to be canceled. (*Maintained action*)

Skip Preset:

Keeps the output from activating and automatic reset from occurring, if programmed, when the count value equals the preset value.

Counter Load:

Places the counter load value into the count display and operates from that value. (*Maintained action*)

Print Request:

Transmits the values specified in the Program Print Options module over the serial port. (*Maintained action*)

Program Disable:

Can be used alone, or in conjunction with the program disable DIP switch, to provide a variety of program security modes. (*External User Input only*)

Inhibit Count:

Prevents pulses from being counted on Inputs A and B. (*User Input 4 only*). The rate input is not affected by the inhibit setting and continues to display the rate of the signal at Input A.

OUTPUT(S)

Output Assignment:

The LGPB can have outputs 1 through 4 assigned to the process or the rate.

Outputs 3 and 4 can also be assigned to the batch or total.

The LGPM can have outputs 1 through 6 assigned to either count or rate.

Phase:

Each output can have its active logic state set for positive phase (normally off) or negative phase (normally on).

Output Activation Mode:

- Latched
- Boundary
- Timed - 0.01 to 99.99 seconds

Hi/Lo Acting:

This mode is used in conjunction with all Rate modes and the Boundary count modes. A Lo acting output would perform the Output action when the count/rate is lower than the preset. A Hi acting output would perform the Output action when the count/rate is higher than or equal to the preset.

Rate Output On/Off Delay:

Used to prevent output chatter. Output condition must be satisfied for a period of time longer than delay period for output state to change.

On Delay: Prevents activation of output(s) for the amount of time programmed.

Off Delay: Prevents deactivation of output(s) for the amount of time programmed.

On & Off Delay: This mode prevents output state change for specified delay period when turning on or off.

Output Reset Mode:

Outputs 1 & 2 Only:

- End Output 1 @ Output 2 Start
- End Output 1 @ Timed Output 2 End
- End Output 2 @ Output 1 Start
- End Output 2 @ Timed Output 1 End

Output(s) Power Up or Power Down State:

The Output's state can be set to be Off (Inactive) @ power up.

OR

The Output's state can be saved @ power down and restored at power-up.

OR

The Output's state can be set to be ON (Active) @ power up.

Note: Power down state for Latched Mode Only.

Reset Output when Count is Reset:

This feature can be enabled or disabled.

Request Message:

Each output can be programmed to request a specific message when the output conditions are satisfied.

INDICATION DISPLAYS

Each of the four indication displays is programmed individually. Each line of each indication display can be programmed to show a value mnemonic, a numeric value, the output status, a preset value, the counter load value, or a custom display line. The mnemonics are factory set to; RATE, PEAK, VALLEY, COUNT*, PROCESS*, BATCH*, TOTAL*, and OVERFLOW. Each mnemonic can be individually changed to a mnemonic tailored to a specific application. The first character of the full mnemonic is displayed to the left of the appropriate numeric value if the other line is not programmed to display the full mnemonic. Each of the 4 indication displays can be programmed to be green or red on dual color models.

** On Models with these available display options.*

Scroll Speed:

- None
- 2.5 Seconds
- 5.0 Seconds

Display Intensity:

The brightness of the display can be adjusted from 1 to 5, with 5 as the brightest. There is a separate adjustment for each color.

PROGRAMMABLE FUNCTIONS (Cont'd)

INDICATION DISPLAYS (Cont'd)

Custom Display Line:

The Legend Plus has two Custom Display Lines which allow the user to specify the number of digits to be displayed on the line, along with any alphanumeric prefix or suffix.

Program Mnemonic:

Allows the user to modify the mnemonics (RATE, PROCESS, BATCH, etc.) to a mnemonic of your choice. For example, RATE can be changed to read SPEED.

MESSAGES

There are ten messages that can be programmed in the Legend. The following attributes can be set for each message.

Message Text:

Standard Characters - Lower/Upper case letters, numbers, punctuation symbols

Extended Characters (Including most European characters)

Message Priority:

1 to 8 (1 = highest priority)

Message Type:

1 line block - message scrolls in block fashion on the top line of the display, bottom line contains programmed indication display.

2 line block - message scrolls in block fashion on both lines of the display

1 line scroll - message scrolls right to left on the top line of the display, bottom line contains programmed indication display

2 line scroll - Top line scrolls right to left, bottom line is blanked

Maintained/Momentary Request:

A Maintained Request setting enables messages to be restored or redisplayed, when the display is available if the input/output action requesting the message is still active.

A Momentary Message setting will allow only one request per message requesting input/output action. Lower priority messages will be canceled by higher priority messages.

Blinking Message:

Enables the message to blink when displayed. Only available with 1 or 2 line block messages.

Multiplex:

Setting this parameter to yes will cause the unit to display the message for 2 seconds, then display the programmed display for 2 seconds. Only available with 1 or 2 line block messages.

Message Cancellation:

The displayed message is canceled when:

A message of equal or higher priority is requested.

Message times out (Timed) and input/output is deactivated.

User input or output is deactivated (Til End).

User input programmed for clear message is activated.

Message Time:

Ranges from 1 to 599 Seconds.

Message Color: (Dual Color Option only)

Green or Red

COMMUNICATION PORT

Jumper selectable for RS-485 or RS-232

Baud Rate - 1200 to 9600

Parity - Odd (7 data bits), Even (7 data bits), or No parity (8 data bits)

Unit Address - 00 to 99

Transmit Delay - 0.002 or 0.100 seconds

PRINT OPTIONS

The programmable print options specify which values are transmitted when a print request is issued. The available options are; Rate, Peak, Valley, Count*, Process*, Batch*, Total*, Scale Factors, Preset(s), Counter Load values, and Message 0.

** On Models with these available display options.*

The unit can be programmed to transmit or NOT to transmit mnemonics (unit address & value identifiers). The mnemonic transmitted is the first three characters of the programmed display mnemonic. For total, only the first character is transmitted. A transmit and reset count capability allows the selected count values to automatically reset after the value is printed (transmitted).

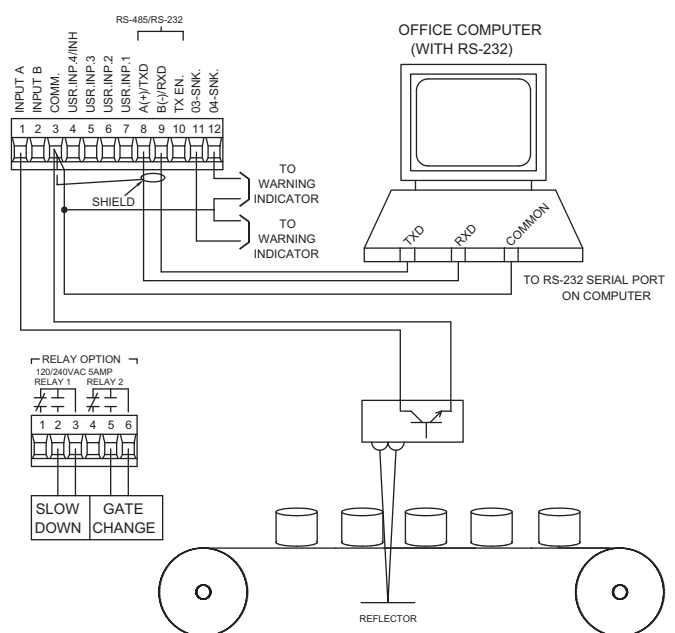
OPERATOR ACCESS TO FRONT PANEL

There are several program disable modes that can be used to limit the operator from programming the parameter values via the front panel keypad. The Program Disable DIP switch can be used alone or in conjunction with a User Input, programmed for the program disable function and a programmable code value, to provide the desired level of security.

MODEL LGPB APPLICATION

A local canning plant wishes to improve the display and control capabilities of its nine process lines. There is a requirement to add message interaction for the operators during process operation. The following application facts and requirements have been specified by the plant engineer.

1. The cans are sensed by a photo-electric device specially suited for can manufacturing. The device produces one pulse per can.
2. The can count for the process of boxing the cans is the first requirement. The can count is never changed, there are always 24 cans to each box. An output is required at 20 cans to slow the line temporarily until the second output is turned on. The second output changes the gate direction to begin the next grouping of 24. The second output has a time delay output of 2 seconds. After the time delay, both outputs are reset and ready for the next process cycle.
3. A count of the number of batches is required for each 8-hour shift. This count is recorded and reset by the manufacturing computer.
4. A total count of cans produced per 24-hour period is required. This count is also transmitted to the manufacturing computer, and reset as required via the communication link.
5. A display of cans per minute is required with minimum and maximum speed limits. Output 3 activates below 100 counts per minute and Output 4 activates above 500 counts per minute.
6. The four desired displays are process, batch, total, and rate. These are to be scrolled via the front panel.
7. The customer also wants the following messages displayed when the listed events occur:
Output 3 - Line #4 Slow
Output 4 - Overspd STOP! (Wants this display to stand out and have top priority)
Proximity 1 - Check Label Glue
Proximity 2 - Check Top Supply
Proximity 3 - System Fault! Stop Line #4! (Wants this display to stand out and have top priority)



8. Once the unit is set up, the only front panel access should be for a reset of the process count and viewing of the displays.

The following page is a chart of the necessary programming for the Legend Plus unit.

LEGEND PLUS PROGRAM SHEET

SCALING

COUNT SF 1.0000
 RATE SF 1.0000
 TOT SF 1.0000
 CNT. SCM X1.0
 CNT. D.P. 0
 RATE SCM X1.0
 RATE PER MINUTE
 RATE D.P. 0
 TOT D.P. 0
 CHG. CNT YES

RATE

MIN. TIME 1.0
 MAX. TIME 5.0

COUNTER

CNT. INPUT CT+DIRX1
 PRC. RST. TO ZERO
 P AUTO. RS OUT2
 BAT. RST. TO ZERO
 B AUTO. RS DISABLED
 TOT. RST. TO ZERO

MESSAGE

MSG. #1	<u>1</u>	MSG. #4	<u>4</u>
TEXT	<u>GATE CHANGE</u>	TEXT	<u>SYSTEM</u>
		FAULT- STOP LINE #4	
PRIORITY	<u>8</u>	PRIORITY	<u>5</u>
TYPE	<u>2L BLOCK</u>	TYPE	<u>2L BLOCK</u>
BLINKING	<u>NO</u>	BLINKING	<u>YES</u>
MULTIPLEX	<u>NO</u>	MULTIPLEX	<u>NO</u>
CANCEL	<u>TIL END</u>	CANCEL	<u>TIMED</u>
TIME SEC.	<u> </u>	TIME SEC.	<u>1</u>
COLOR	<u>GREEN</u>	COLOR	<u>RED</u>

USER INPUTS

BIN. MSG.REQ.NONE

USER INP. 1	<u>REQMSG#5</u>	USER INP. 2	<u>REQMSG#6</u>
USER INP. 3	<u>REQMSG#4</u>	USER INP. 4	<u>CLRMSG</u>
USER F1	<u>NO MODE</u>	USER F2	<u>MNT.RST</u>
			<u>PRC-YES</u>

MSG. #2	<u>2</u>	MSG. #5	<u>5</u>
TEXT	<u>LINE #4</u>	TEXT	<u>CHECK LABEL</u>
	<u>SLOW</u>		<u>GLUE</u>
PRIORITY	<u>7</u>	PRIORITY	<u>6</u>
TYPE	<u>2L BLOCK</u>	TYPE	<u>1L SCROL</u>
BLINKING	<u>YES</u>	BLINKING	<u> </u>
MULTIPLEX	<u>YES</u>	MULTIPLEX	<u> </u>
CANCEL	<u>TIL END</u>	CANCEL	<u>TIMED</u>
TIME SEC.	<u> </u>	TIME SEC.	<u>1</u>
COLOR	<u>GREEN</u>	COLOR	<u>GREEN</u>

OUTPUTS

OUTPUT 1		OUTPUT 2	
ASSIGNED	<u>TO PRC</u>	ASSIGNED	<u>TO PRC</u>
PHASE	<u>+</u>	PHASE	<u>+</u>
TYPE	<u>LATCHED</u>	TYPE	<u>TIMED</u>
ACT/TIME	<u> </u>	ACT/TIME	<u>2.00</u>
OUTPUT END	<u>@OUT2END</u>	OUTPUT END	<u>DISABLED</u>
OFF @ P.	<u>OFF@PUP</u>	OFF @ P.	<u>OFF@PUP</u>
RST/C	<u>EN</u>	RST/C	<u>EN</u>
REQ MSG #	<u> </u>	REQ MSG #	<u> </u>

MSG. #3	<u>3</u>	MSG. #6	<u>6</u>
TEXT	<u>OVERSPD</u>	TEXT	<u>CHECK TOP</u>
	<u>STOP</u>		<u>SUPPLY</u>
PRIORITY	<u>5</u>	PRIORITY	<u>6</u>
TYPE	<u>2L BLOCK</u>	TYPE	<u>1L SCROL</u>
BLINKING	<u>YES</u>	BLINKING	<u> </u>
MULTIPLEX	<u>YES</u>	MULTIPLEX	<u> </u>
CANCEL	<u>TIL END</u>	CANCEL	<u>TIMED</u>
TIME SEC.	<u> </u>	TIME SEC.	<u>1</u>
COLOR	<u>RED</u>	COLOR	<u>GREEN</u>

OUTPUT 3		OUTPUT 4	
ASSIGNED	<u>TO RATE</u>	ASSIGNED	<u>TO RATE</u>
PHASE	<u>+</u>	PHASE	<u>+</u>
TYPE	<u>BOUNDARY</u>	TYPE	<u>BOUNDARY</u>
ACT/TIME	<u>LO ACT</u>	ACT/TIME	<u>HI ACT</u>
OFF @ P.	<u>OFF@PUP</u>	OFF @ P.	<u>OFF@PUP</u>
RST/C	<u>EN</u>	RST/C	<u>EN</u>
REQ MSG #	<u>2</u>	REQ MSG #	<u>3</u>

DISPLAY

DISPLY 1		DISPLY 2	
D1 LINE 1	<u>CUSTOM 2</u>	D2 LINE 1	<u>BAT-MNE</u>
D1 LINE 2	<u>OUTPUTS</u>	D2 LINE 2	<u>BAT-VAL</u>
D1 COLOR	<u>GREEN</u>	D2 COLOR	<u>GREEN</u>

OPTIONS

ACCESS		PRESETS	
P1	<u>NO</u>	P1	<u>20</u>
P2	<u>NO</u>	P2	<u>24</u>
P3	<u>NO</u>	P3	<u>100</u>
P4	<u>NO</u>	P4	<u>500</u>
CTLD.	<u>NO</u>	CL	<u>0</u>
SF'S	<u>NO</u>		

DISPLY 3		DISPLY 4	
D3 LINE 1	<u>CUSTOM 1</u>	D4 LINE 1	<u>TOT-MNE</u>
D3 LINE 2	<u>CUSTOM 2</u>	D4 LINE 2	<u>TOT-VAL</u>
D3 COLOR	<u>GREEN</u>	D4 COLOR	<u>GREEN</u>

PRESET TRACKING

P1 TRACK NONE
 P2 TRACK NONE
 P3 TRACK NONE
 P4 TRACK NONE
 PRO. CODE 33

SCRO. SPD	<u>NONE</u>	MNEMONIC	
DSP. LEVEL G	<u>10</u>	RATE	<u>SPEED</u>
R	<u>10</u>	PEAK	<u>P</u>
		VALLEY	<u>V</u>

CUST. DSP.		PROC/CNT	<u>CANS</u>
CUST.DSP.1	<u>VAL-RATE</u>	BATCH	<u>CASES</u>
	<u> -CPM</u>	TOTAL	<u>TOT.CANS</u>
CUST. DPS.2	<u>VAL-PRC</u>	OVERFLOW	<u>OVERFLOW</u>
	<u> -CANS</u>		

ORDERING INFORMATION

MODEL NO.	DESCRIPTION	PART NUMBER 115/230 VAC & +12VDC
LGPB	Four Preset Batch Legend Plus w/Grn Backlighting	LGPB0000
	Four Preset Batch Legend Plus w/Red Backlighting	LGPB0100
	Four Preset Batch Legend Plus w/Dual Color Backlighting	LGPB0200
LGPM	Multi-Preset (6) Legend Plus w/Grn Backlighting	LGPM0001
	Multi-Preset (6) Legend Plus w/Red Backlighting	LGPM0101
	Multi-Preset (6) Legend Plus w/Dual Color Backlighting	LGPM0201
LGPBF	Four Preset Foot-Inch Counter w/Red Backlighting	LGPBF100
SFLGP	Legend Plus Programming Software, 3 1/2", 1.44 M Disk	SFLGP
	Dual Relay Board (Model LGPBs only)	RLYL002

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LIMITED WARRANTY

The Company warrants the products it manufactures against defects in materials and workmanship for a period limited to two years from the date of shipment, provided the products have been stored, handled, installed, and used under proper conditions. The Company's liability under this limited warranty shall extend only to the repair or replacement of a defective product, at The Company's option. The Company disclaims all liability for any affirmation, promise or representation with respect to the products.

The customer agrees to hold Red Lion Controls harmless from, defend, and indemnify RLC against damages, claims, and expenses arising out of subsequent sales of RLC products or products containing components manufactured by RLC and based upon personal injuries, deaths, property damage, lost profits, and other matters which Buyer, its employees, or sub-contractors are or may be to any extent liable, including without limitation penalties imposed by the Consumer Product Safety Act (P.L. 92-573) and liability imposed upon any person pursuant to the Magnuson-Moss Warranty Act (P.L. 93-637), as now in effect or as amended hereafter.

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