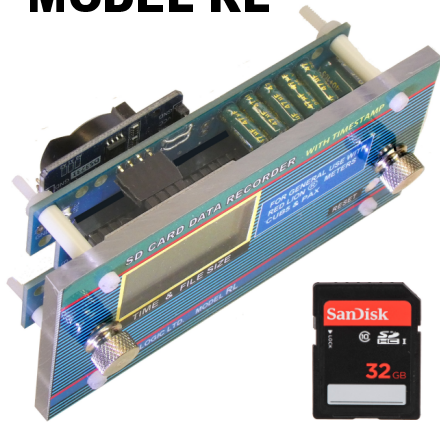# ADD-ON DATA LOGGER FOR RED LION™ METERS
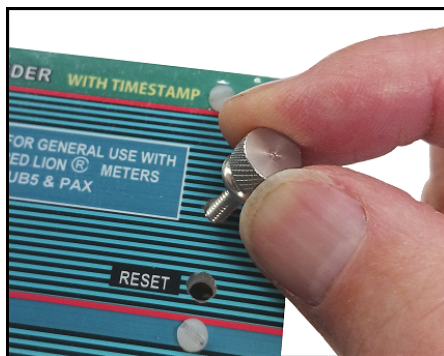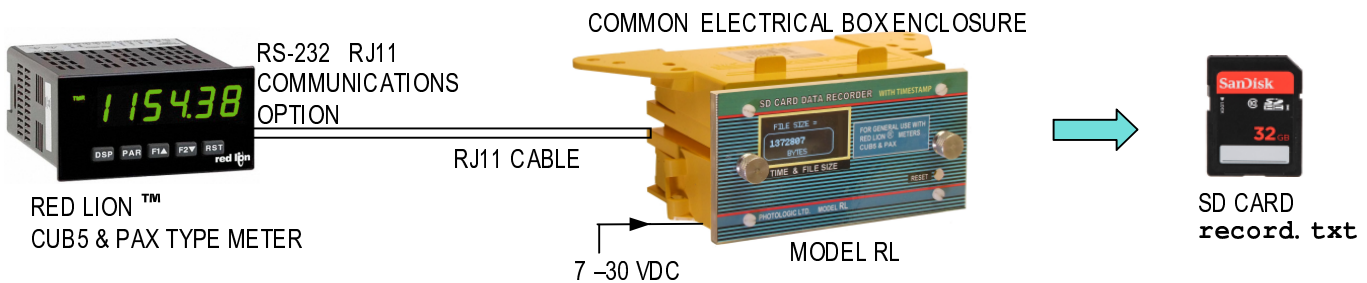
MODEL RL

MODEL RL LOGGER

MODEL RL FASTENS INTO COMMON ELECTRICAL BOXES TO PROVIDE USER FLEXIBILITY IN MOUNTING METHODS.

- **Turn a Red Lion™ meter (CUB5 & PAX) into a recording meter with time stamp.**
- **A simple, stand alone, independent system.   No PC or PLC required**
- **Plugs into the optional serial communications card of the Red Lion™ meter.**
- **Compatible to many Red Lion meters: CUB5 and PAX .**

RS-232 RJ11 COMMUNICATIONS OPTION

RED LION ™ CUB5 & PAX TYPE METER

COMMON ELECTRICAL BOX ENCLOSURE
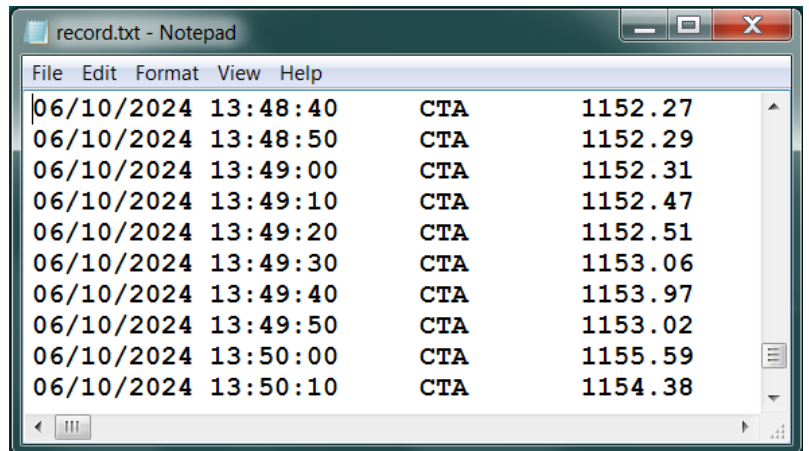
RJ11 CABLE

7 –30 VDC

MODEL RL

SD CARD
record.txt

The SD Card is secured behind the front panel for protection.
The front panel can be released without a screwdriver using a thumbscrew.

RESET:
The thumbscrew can conveniently activate the recessed Reset Button when a new configuration is to be set.

EXAMPLE RESULT:
record.txt


```
06/10/2024  13:48:40      CTA      1152.27
06/10/2024  13:48:50      CTA      1152.29
06/10/2024  13:49:00      CTA      1152.31
06/10/2024  13:49:10      CTA      1152.47
06/10/2024  13:49:20      CTA      1152.51
06/10/2024  13:49:30      CTA      1153.06
06/10/2024  13:49:40      CTA      1153.97
06/10/2024  13:49:50      CTA      1153.02
06/10/2024  13:50:00      CTA      1155.59
06/10/2024  13:50:10      CTA      1154.38
```

MODEL RL TIMESTAMP   METER REGISTER   METER VALUE

FEATURES:

User Configurable Sample Rate:
Sample meter value every 10 seconds to every 50,000 seconds.   Use `config.txt` resident
on the SD Card.   This provides the user with choice of the most appropriate recording frequency.

Set `config.txt` To Retrieve Multiple Meter Registers:
In addition to logging the meter Input value, the user can also record other registers that the
Red Lion™ meter may support. Typical registers in the meter may include:
Input, Total,   Max/Min Input, Setpoints,   Count A, Count B,   Rate.

Time Stamp Each Meter Value:
Each sample that is received from the meter is Date-Time Stamped by the RL Unit.
This is an extraordinarily necessary function for the user to be able to later analyse logged
measurement data.

Front Panel Display:
Offers constant user feedback of recorder status by displaying:
1.) Time progressing in seconds shows meter is powered and operating.
2.) File size of `record.txt` increasing with data received is updated every sample.
3.) SD Card Error displayed. SD Card is checked after every sample Write.
The display offers user assurance of successful logging.

User Choice of Various Enclosures:
Model RL fits into a common, inexpensive electrical outlet.
● This enclosure style limits access to the SD Card by requiring Thumbscrew unfastening of
   the RL Unit. The card is protected, but can be accessed without a screwdriver.
● User may choose a specific outlet style to satisfy mounting methods such
   as fastening at top, bottom, side or back.
● Use the enclosure punch-outs and break-offs to obtain enclosure mounting flexibility.
● A cutout can be made in the bottom of the enclosure by the user to give direct access to the
   SD Card without removing the thumbscrews.
● Some outlets offer waterproof/dustproof or locking features with transparent door access.

32 GB SD Card Capacity:
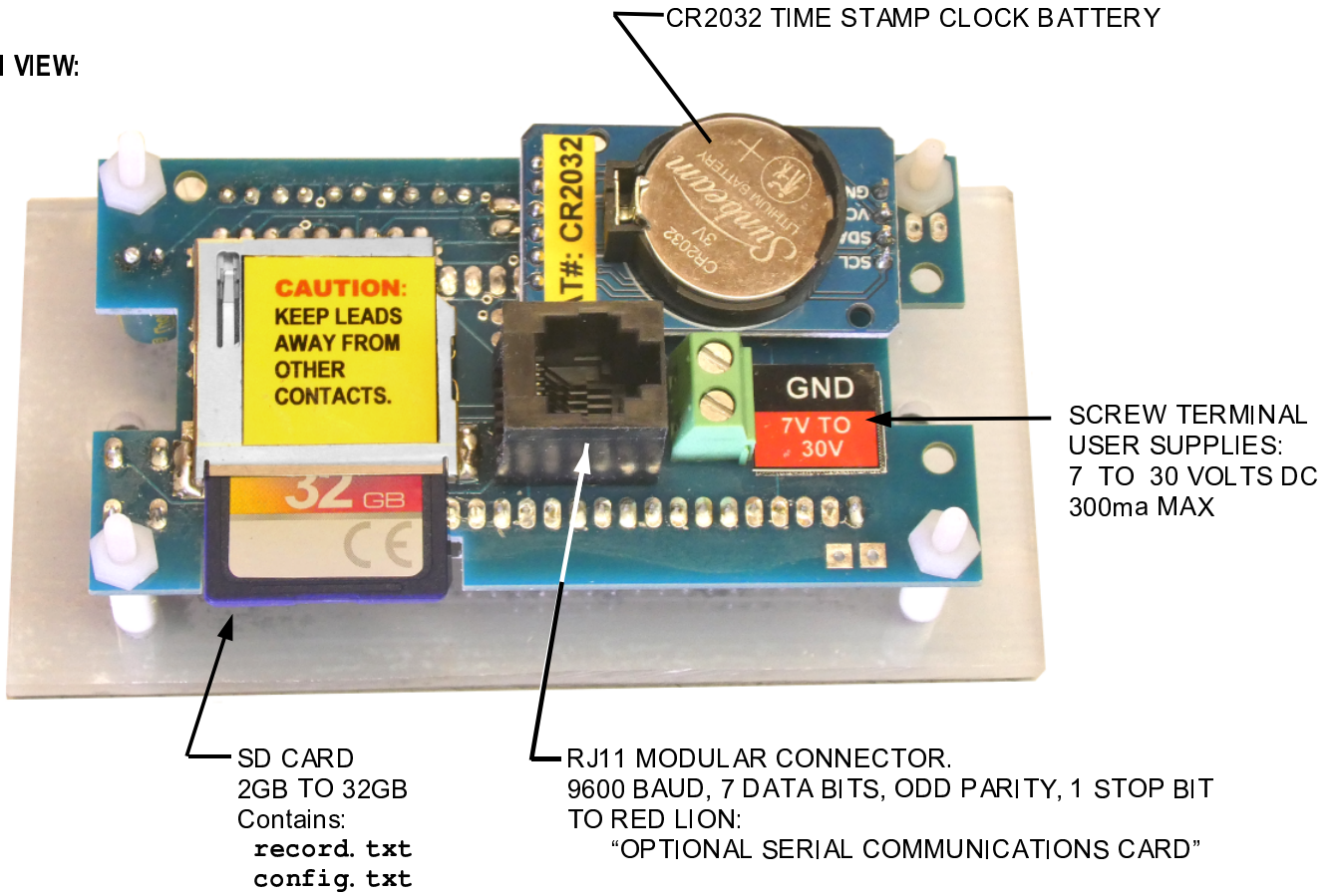The user can record meter values for weeks, months, and years.
● Storage capacity of 32 GB equates to approximately 32,000,000,000 characters or
   32GB / 60 characters/meter reading =   500 million readings.
● If a meter reading is recorded every 10 seconds, then the maximum logging period would be:
   500 million readings/10 sec = 50 million seconds = 578 days

Easy Connectivity To Red Lion™ Meter:
The meter must have "SERIAL COMMUNICATIONS PLUG-IN OPTION CARD" installed.
● This option card may be one of three Red Lion™ versions:
 1.) RJ11 Connector   2.) Screw Terminal Block   3.) DB9 9 Pin Female Receptacle
   Model RL is available with versions to support any of the above.
● For RJ11 connection, just plug in cable.
● RJ11 modular cable is run from the RL unit to the meter.   The user may extend the
   modular cable from 2 feet to at least 50 feet.
● Model RL does not draw any power from the meter as the RL Unit has it's own separate
   independent power input of 7 to 30 volts DC supplied by the user.

BOTTOM VIEW:

CR2032 TIME STAMP CLOCK BATTERY

CAUTION:
KEEP LEADS
AWAY FROM
OTHER
CONTACTS.

AT#: CR2032

GND
7V TO
30V

SCREW TERMINAL
USER SUPPLIES:
7 TO 30 VOLTS DC
300ma MAX

SD CARD
2GB TO 32GB
Contains:
   record. txt
   config. txt

RJ11 MODULAR CONNECTOR.
9600 BAUD, 7 DATA BITS, ODD PARITY, 1 STOP BIT
TO RED LION:
      "OPTIONAL SERIAL COMMUNICATIONS CARD"

DISPLAY

MONTH / DAY / YEAR 10/25/2024 21:57:54 TIME & FILE SIZE	FILE SIZE = 1372807 BYTES TIME & FILE SIZE	CHECK SD CARD TIME & FILE SIZE
TIME	FILE SIZE	SD CARD ERROR

The display alternates between Time and File Size every two seconds. The frequent changing of display
helps to assure the user of correct recording operation. File size increments with meter data received.
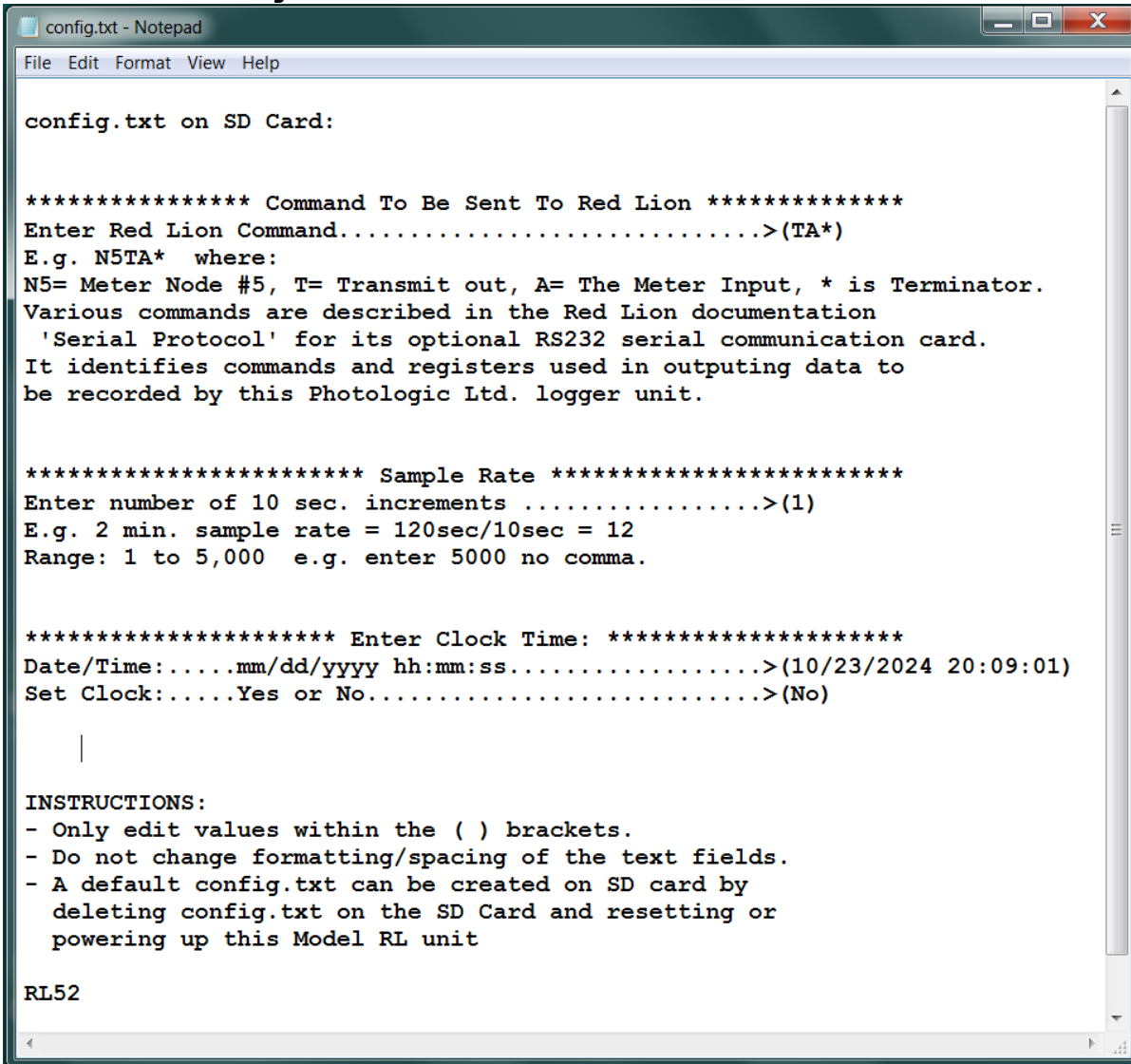
MOUNT RL UNIT INTO VARIOUS COMMON ELECTRICAL BOXES:

Model RL fits into common, inexpensive boxes to provide easy mounting options. Use the knock out
holes and break-off tabs to suit your need.   Some boxes are available for outdoor use.
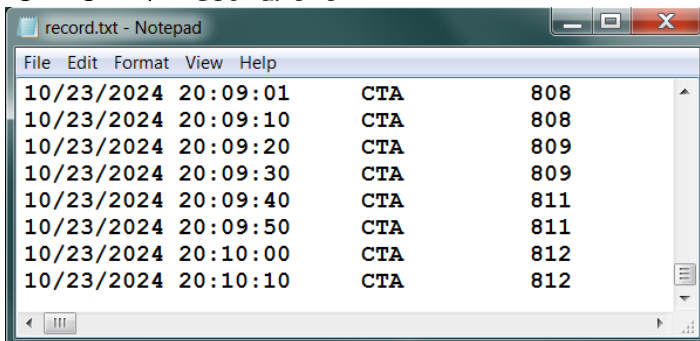
CONFIGURATION FILE:

`SD CARD > config.txt`

```
config.txt - Notepad
File  Edit  Format  View  Help

config.txt on SD Card:


*************** Command To Be Sent To Red Lion **************
Enter Red Lion Command............................>(TA*)
E.g. N5TA*  where:
N5= Meter Node #5, T= Transmit out, A= The Meter Input, * is Terminator.
Various commands are described in the Red Lion documentation
 'Serial Protocol' for its optional RS232 serial communication card.
It identifies commands and registers used in outputing data to
be recorded by this Photologic Ltd. logger unit.


********************** Sample Rate ***********************
Enter number of 10 sec. increments .................>(1)
E.g. 2 min. sample rate = 120sec/10sec = 12
Range: 1 to 5,000  e.g. enter 5000 no comma.


********************* Enter Clock Time: ********************
Date/Time:.....mm/dd/yyyy hh:mm:ss..................>(10/23/2024 20:09:01)
Set Clock:.....Yes or No...........................>(No)

    |


INSTRUCTIONS:
- Only edit values within the ( ) brackets.
- Do not change formatting/spacing of the text fields.
- A default config.txt can be created on SD card by
  deleting config.txt on the SD Card and resetting or
  powering up this Model RL unit

RL52
```

In sample above the character string: **TA***   is sent to the Red Lion™ meter every 10 seconds.
The meter then transmits the meter display value (e.g. volts, count, etc.) from meter register **A**
The RL Unit appends the response to record.txt with a timestamp.

LOGGING RESULT: `record.txt`

```
record.txt - Notepad
File  Edit  Format  View  Help
10/23/2024 20:09:01     CTA        808
10/23/2024 20:09:10     CTA        808
10/23/2024 20:09:20     CTA        809
10/23/2024 20:09:30     CTA        809
10/23/2024 20:09:40     CTA        811
10/23/2024 20:09:50     CTA        811
10/23/2024 20:10:00     CTA        812
10/23/2024 20:10:10     CTA        812
```

RL UNIT TIMESTAMP   COUNTER **A** REGISTER   VALUE

COMMANDS FOR YOUR METER:

See the Red Lion ™
Serial Communications Protocol
(Sending Commands)

BASIC OPERATION:

After configuration is set in `config.txt` file, the logger automatically transmits a command to the Red Lion meter, (e.g. every 10 sec.). For each transmission, the meter returns the measurement data. The logger appends the measurement data to SD Card `record.txt` file. The measurement data is time stamped by the logger.

COMMANDS FOR YOUR METER:

In the Red Lion™ user guide for your specific model of meter, locate the section:
Serial Communications Protocol (Sending Commands)

Charts exist such as this example below for a Model PAX meter:

Command Chart

Command	Description	Notes
N	Node Address Specifier	Address a specific meter. Must be followed by one or two digit node address. Not required when node address = 0.
T	Transmit Value (read)	Read a register from the meter. Must be followed by register ID character.
V	Value change (write)	Write to register of the meter. Must be followed by register ID character and numeric data.
R	Reset	Reset a register or output. Must be followed by register ID charactert.
P	Block Print Request (read)	Initiates a block print output. Registers are defined in programming.

Register Identification Chart

ID	Value Description	Register ID	Applicable Commands/Comments
A	Input	INP	T, P, R (Reset command [Ver2.5+] zeroes the input ["REL" or Tare])
B	Total	TOT	T, P, R (Reset command resets total to zero)
C	Max Input	MAX	T, P, R (Reset command resets MAX to current reading)
D	Min Input	MIN	T, P, R (Reset command resets MIN to current reading)
E	Setpoint 1	SP1	T, P, V, R (Reset command resets the setpoint output).

Above charts are example only.
Not all commands or registers apply to the nature of use with Model RL.
Example: **R** Reset (write) command would not be desired as RL Unit would send the command every 10 seconds being of no benefit, and disrupting existing meter operation.
► Mainly use **T** Transmit Value (read) command for register ID "A" Input.
Thus, enter **TA*** in RL Unit `config.txt` (command to send to Red Lion™ meter).
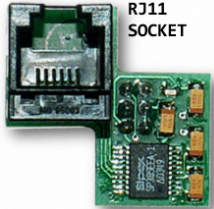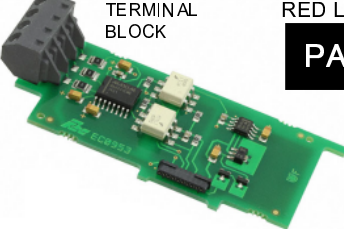This causes the meter to return the display value, (Input).
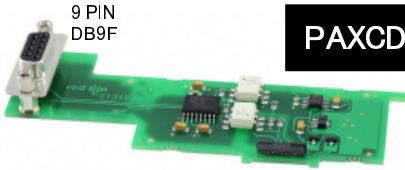
STATEMENT ON CONNECTION COMPATIBILITY

The meter should have one of the Red Lion™ serial communication card options installed:

AFFECTED SERIES:	USER SUPPLIED:	PHOTOLOGIC LTD. SUPPLIED:
CUB5 Meter Series: RS232 Serial Communications Card ● Utilizes RJ11 Modular Connector 6-6	RJ11 SOCKET — RED LION PART# **CUB5COM**	PHOTOLOGIC KIT PART# **RL - A**
PAX Meter Series: RS232 Serial Communications Card ● Utilizes 4 Postion Screw Terminal Block	TERMINAL BLOCK — RED LION PART# **PAXCDC20**	PHOTOLOGIC KIT PART# **RL - B**
PAX Meter Series: RS232 Serial Communications Card ● Utilizes 9 Pin D Connector Female	9 PIN DB9F — RED LION PART# **PAXCDC2C**	PHOTOLOGIC KIT PART# **RL - C**

Model RL Unit does not support Red Lion™ RS485 Communication Cards

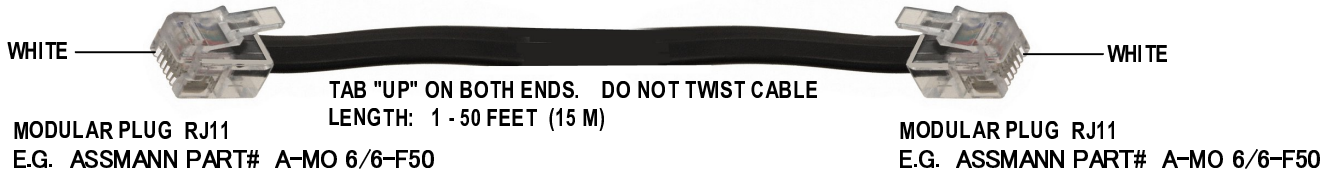# MODULAR CABLE
● MOST POPULAR CONNECTION TO RED LION METER

ATTACH TO RED LION METER
SERIAL COMMUNICATIONS CARD

ATTACH TO MODEL RL LOGGER

WHITE

WHITE

TAB "UP" ON BOTH ENDS.   DO NOT TWIST CABLE
LENGTH: 1 - 50 FEET (15 M)

MODULAR PLUG RJ11
E.G. ASSMANN PART# A-MO 6/6-F50

MODULAR PLUG RJ11
E.G. ASSMANN PART# A-MO 6/6-F50

UNFINISHED 6 CONDUCTOR MODULAR CABLE
E.G. ASSMANN PART#: _____

FINISHED ASSEMBLED CABLE (WITH PLUGS):
E.G. PHOTOLOGIC PART#: RL-CAB-A   2 FEET
E.G. ASSMANN PART#:   AT-S-26-6/6/B-7   7 FEET

A

FLYING LEADS CABLE
● USE IF CONNECTING TO RED LION™ SCREW TERMINAL STRIP OPTION

ATTACH TO RED LION METER

ATTACH TO MODEL RL LOGGER

NO CONNECTION — WHITE

DATA TO RED LION ◄— BLACK

GROUND — RED

GROUND — GREEN

DATA TO MODEL RL —► YELLOW

NO CONNECTION — BLUE

WHITE
- BLACK
- RED
- GREEN
- YELLOW
- BLUE

MODULAR PLUG RJ11
E.G. ASSMANN PART# A-MO 6/6-F50

PHOTOLOGIC PART#: RL-CAB-B   2 FOOT LENGTH

B

9 PIN D CONNECTOR CABLE
● PLUGS INTO RED LION™ PAXCDC2C SERIAL COMMUNICATIONS OPTION CARD

ATTACH TO RED LION METER

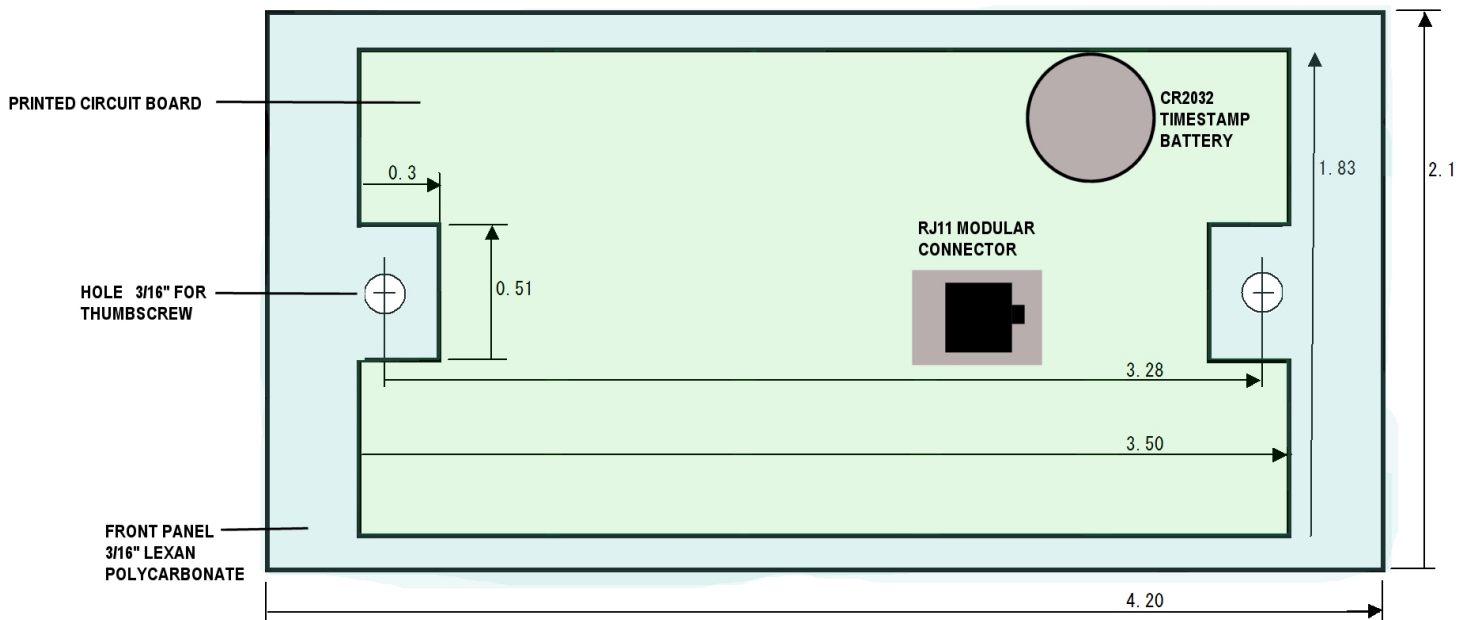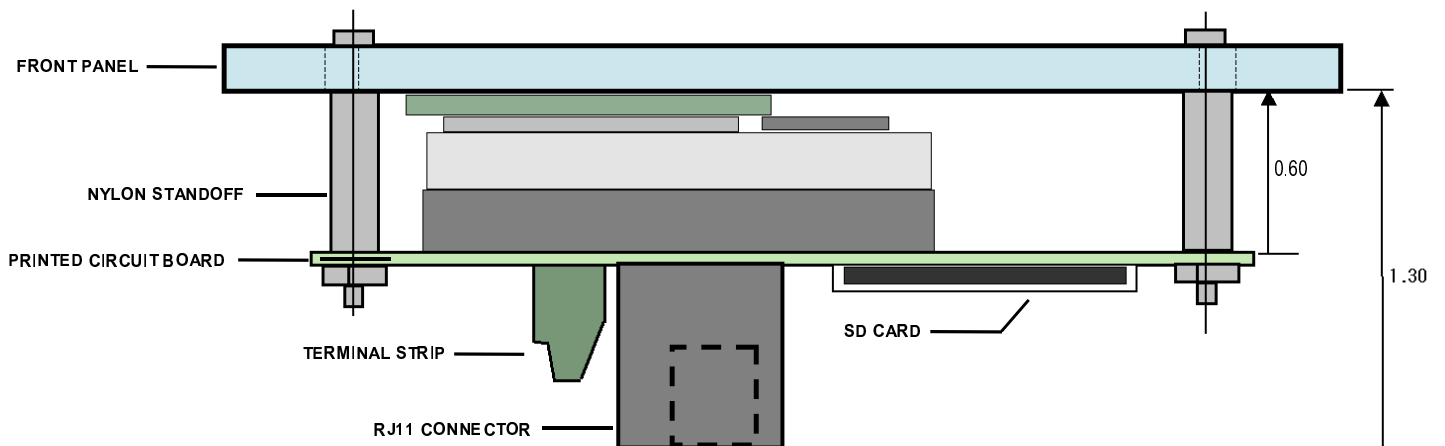**ATTACH TO MODEL RL LOGGER**

6   1

WHITE

BLACK
3 DATA

RED

5 GND
GREEN

2 DATA
YELLOW

9

BLUE

DB9 MALE PLUG
SOLDERED TO CABLE

WHITE
- BLACK
- RED
- GREEN
- YELLOW
- BLUE

MODULAR PLUG RJ11
E.G. ASSMANN PART# A-MO 6/6-F50

PHOTOLOGIC PART#: RL-CAB-C   2 FOOT LENGTH

C

BOTTOM VIEW:

FRONT PANEL
LEXAN POLYCARBONATE
FLAME RESISTANT

DIMENSIONS IN INCHES

PRINTED CIRCUIT BOARD

CR2032
TIMESTAMP
BATTERY

0.3

1.83

2.1

HOLE 3/16" FOR
THUMBSCREW

0.51

RJ11 MODULAR
CONNECTOR

3.28

3.50

FRONT PANEL
3/16" LEXAN
POLYCARBONATE

4.20

SIDE VIEW:

FRONT PANEL

NYLON STANDOFF

PRINTED CIRCUIT BOARD

TERMINAL STRIP

RJ11 CONNECTOR

SD CARD

0.60

1.30
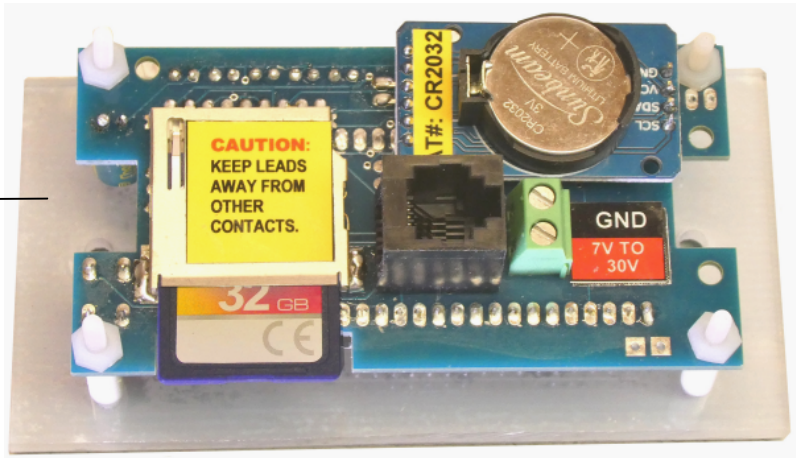
DIMENSIONS IN INCHES

SPECIFICATIONS:

Logger Compatibility:	Red Lion™ meters CUB5™ and PAX™ that support communications card option. The Red Lion meter must support Red Lion *Serial Communications Protocol* (Sending Commands to meter)
Logger Capacity:	300 million samples with 32 GB SD Card, (30 GB / 100 characters/sample)
Recording Duration:	(300 million samples x 10 sec./sample) = 833 Thousand Hours = 34,722 days or an alternate setting at 60 sec./sample: (300 million samples x 60 sec./sample) = 5 Million Hours = 208,333 days
Logger Input:	RS-232 interface data from Red Lion™ meter
Input Connector:	RJ11 6/6 Modular Connector
Logger Output:	Data appends to SD Card file named: record.txt
Logger Timestamp:	Each measurement returned by meter is date/timestamped by logger.
Logging Sample Rate:	Settable in 10 sec. increments from every 10 seconds to every 50,000 seconds
Configuration Settings:	Settable in SD Card config.txt
Display:	Helps confirm operation: displays time and record.txt file size, or SD Card error.
SD Card:	"SD" or "SDHC" 8GB to 32GB (Not MicroSD, Not MiniSD)
Software:	No software required. Single command sent to meter is specified in config.txt
Power:	7 – 30 Volts DC, 300ma Connection: Screw Terminal Strip
Clock Power:	CR2032 Coin Cell
Physical:	4.2in x 2.1in x 1.6in (10.67cm x 5.33cm x 4.06cm) Weight: 0.22 lbs (100g)