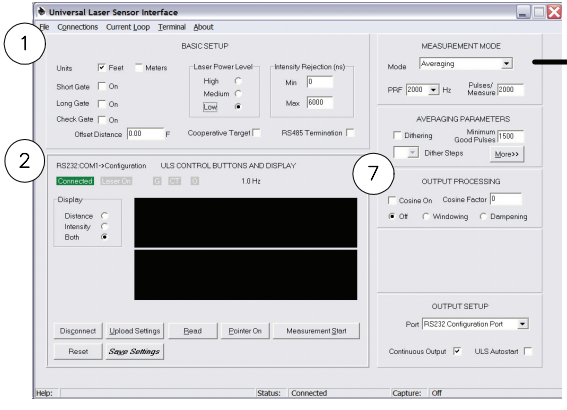
Universal Laser Sensor Quick Reference



	Measurement Mode	Pros	Cons
3	Averaging	Highest Accuracy +/-1 cm Highest Data Rate	Vulnerable in foggy/dusty environments
4	Last Target	Good fog/dust penetration	Accuracy compromised to +/-2 cm
5	Binning	Acquire maximum distances Track/discriminate multiple targets	Accuracy compromised to +/-2.5 cm
6	Detection	Ultra quick detection for precision timing	No range output

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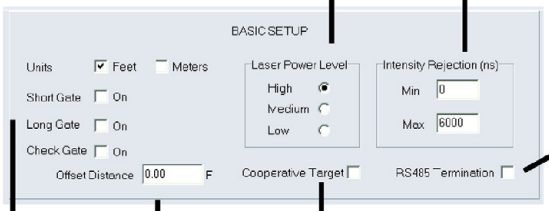
high = 400nJ/pulse
medium = 200nJ/pulse
low = 100nJ/pulse
the higher the level
the higher the range
ability

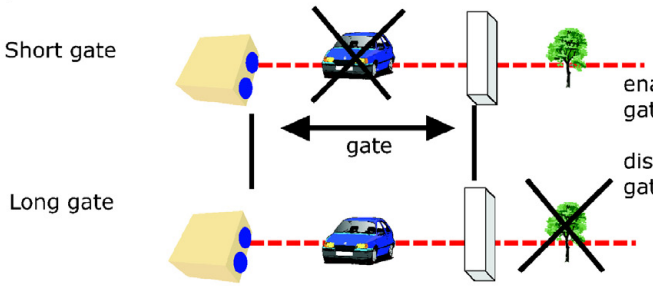
min=set a value and all intensity readings less than this setting are ignored-error 4
max=set a value and all intensity readings over this setting are ignored -error 4



this enables a termination resistor in the ULS and should only be used on the last unit in a multi unit configuration

if targeting to a cooperative target-enable this function when using a prism or reflective material as a target. When enabled the receiver minimum detection threshold is increased to reject any low signals. Very effective when shooting through brush to a cooperative target

offset distance=this distance adds or subtracts a distance from the output reading

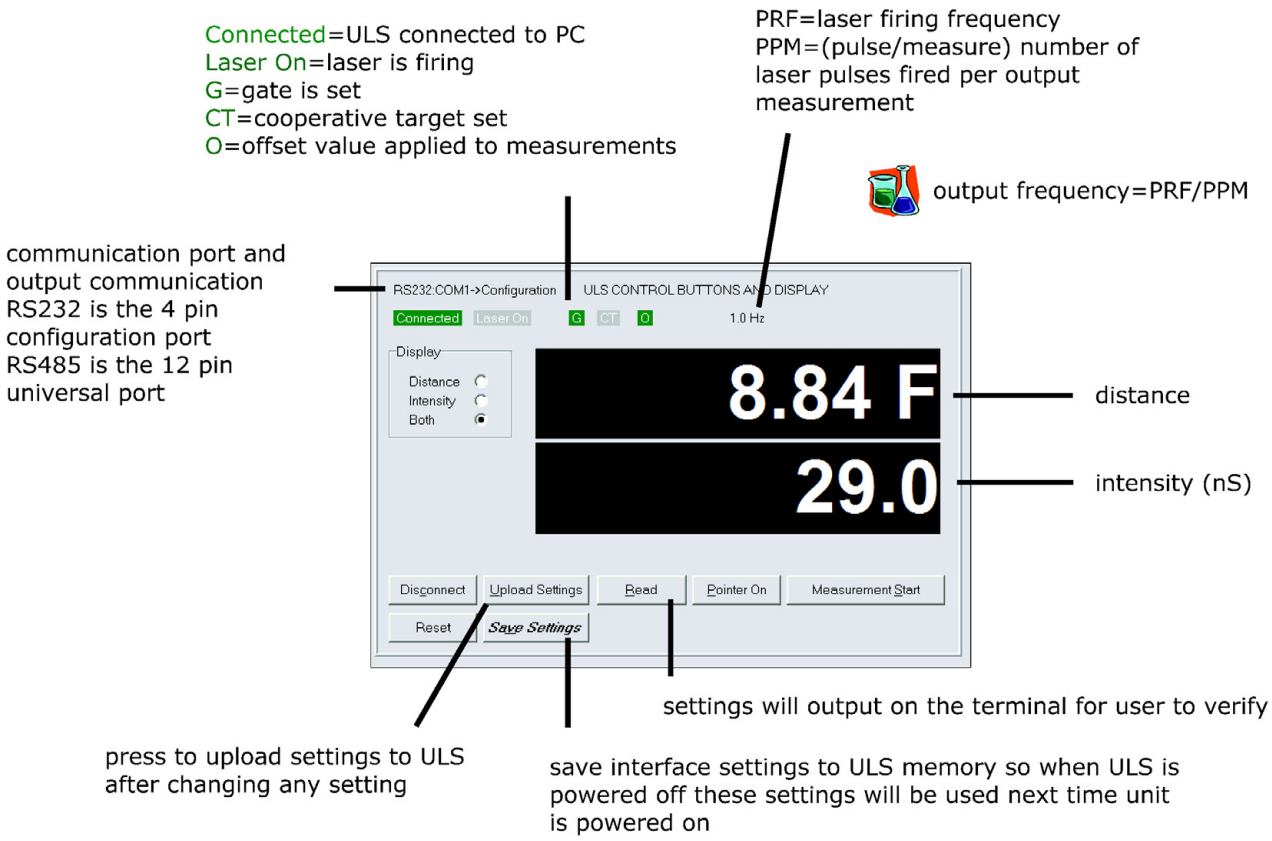


Check gate

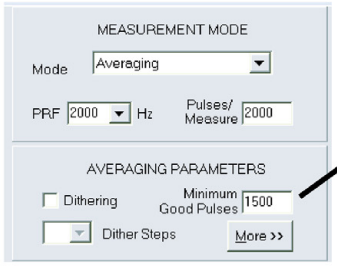
enable check gate= no readings in the gated area are output, error 4 output only

disable check gate=readings in the gated area are output as a running average

NOTES:


Connected=ULS connected to PC
Laser On=laser is firing
G=gate is set
CT=cooperative target set
O=offset value applied to measurements
PRF=laser firing frequency
PPM=(pulse/measure) number of laser pulses fired per output measurement
output frequency=PRF/PPM
communication port and output communication RS232 is the 4 pin configuration port RS485 is the 12 pin universal port
RS232:COM1->Configuration
ULS CONTROL BUTTONS AND DISPLAY
Connected
Laser On
G
CT
O
1.0 Hz
Display
Distance
Intensity
Both
8.84 F
29.0
distance
intensity (nS)
Disconnect
Upload Settings
Read
Pointer On
Measurement Start
Reset
Save Settings
settings will output on the terminal for user to verify
press to upload settings to ULS after changing any setting
save interface settings to ULS memory so when ULS is powered off these settings will be used next time unit is powered on

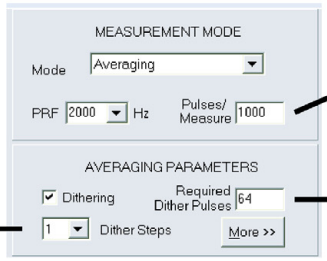
NOTES:



this is the number of good returns required in order to average together

this value must be less than pulses/measure (PPM)
the larger this number the better the accuracy
lower this number if encountering errors
this is the number of pulses averaged

enable dithering to increase accuracy if minimum good pulses is less than 256



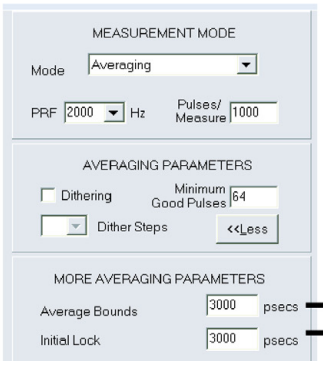
number of laser pulses fired per output measurement

this value must be less than 30% of the pulses/measure (PPM) the larger this number the better the accuracy lower this number if encountering errors
this is the number of pulses averaged

the smaller the dither step size the better the accuracy

the dither step and required dither pulses must be a multiple of 32

(dither steps)(required dither pulses)/32= whole number of 1 or greater



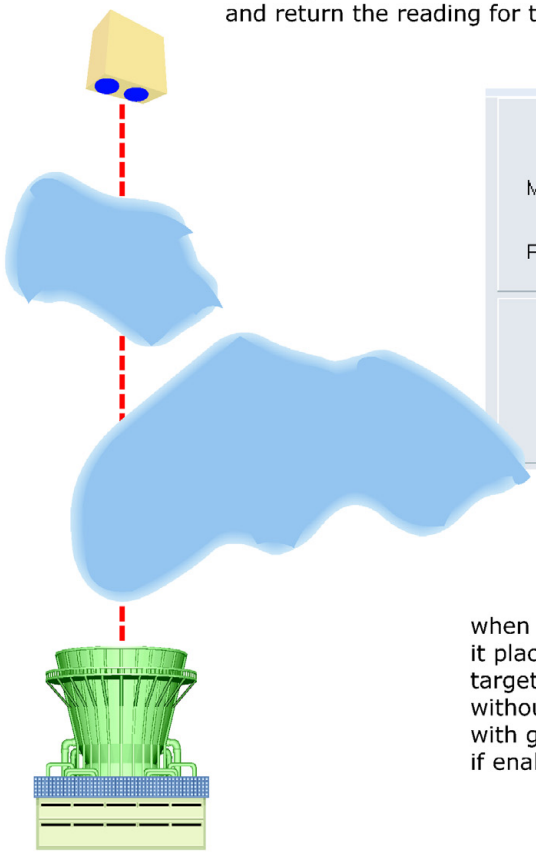
only adjust average bounds and initial lock (increase value) if receiving many error 4 or 5's to see if locking is causing the errors (default=3000)

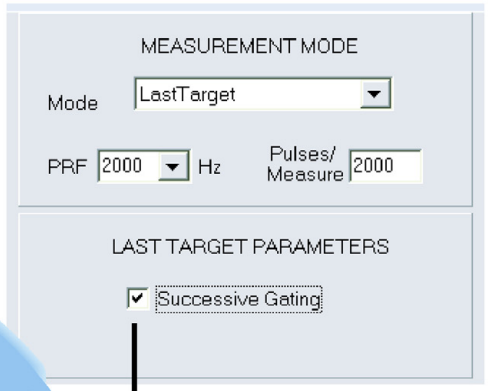
locking is done to keep from mixing multiple return ranges into the average (default=3000)

add 2,000ps for every 1 foot of distance. example: if you are getting mixed returns at 5 feet, put in 10,000 to see if errors disappear

NOTES:

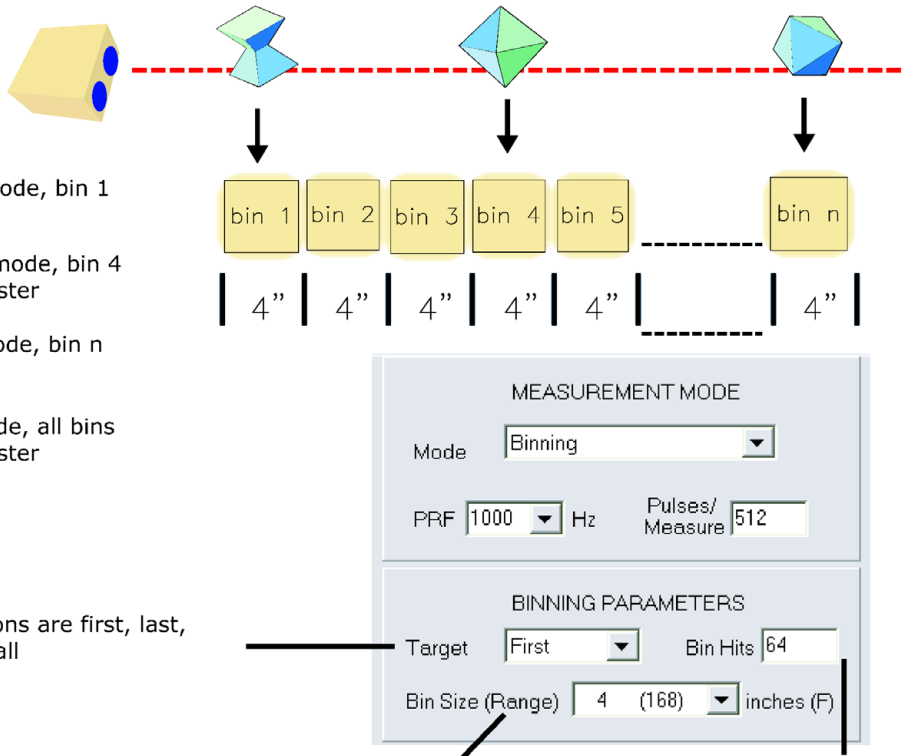
last target mode allows the user to ignore unwanted returns
and return the reading for the last target found





when enabled, ULS looks for last event in a series of 10 pulses.
it places a gate on the last event and look past it, if no further
targets are seen this last event becomes the reading
without gating, target separation is approximately 12 meters
with gating, target separation is approximately 2.5 meters
if enabled PPM should be 40 or greater

NOTES:



in first mode, bin 1 registers

in most mode, bin 4 may register

in last mode, bin n registers

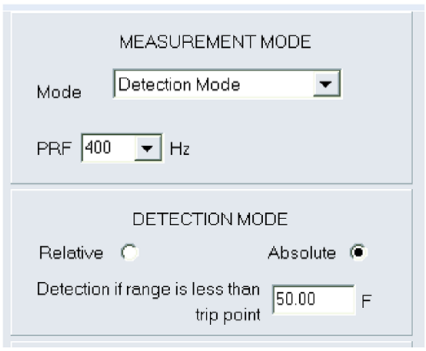
in all mode, all bins may register

target options are first, last, most, and all

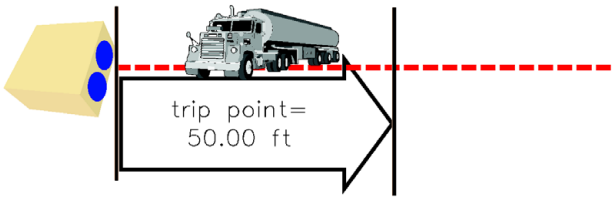
the higher number the bin hits the "stronger" the signal-keep ratio of 1 hit per 8 PPM

set the bin size based on your maximum target distance-ie in this case our max range is 168 ft and each bin size is 4"-see above example

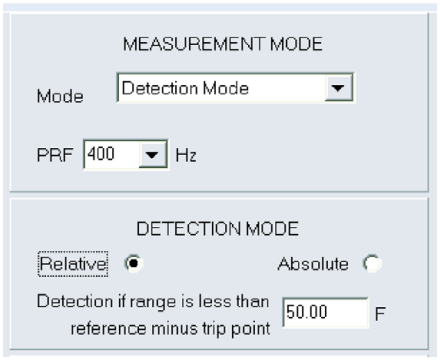
NOTES:



Absolute-no reference needed-trip point is from ULS face plate to a point in space-in this example 50 feet

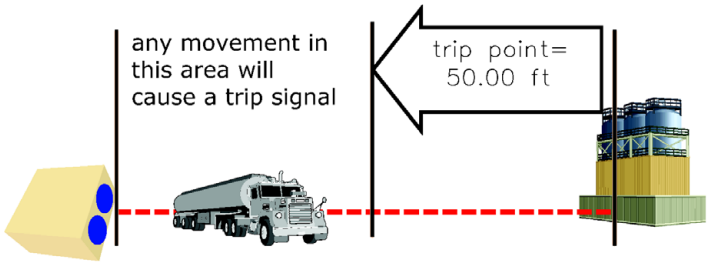


any movement in this area will cause a trip signal



Relative-needs a reference surface-trip point is from reference point to a point in space in front of the reference-in this example 50 feet

Max detection range for relative mode is 65 meters or 213 feet



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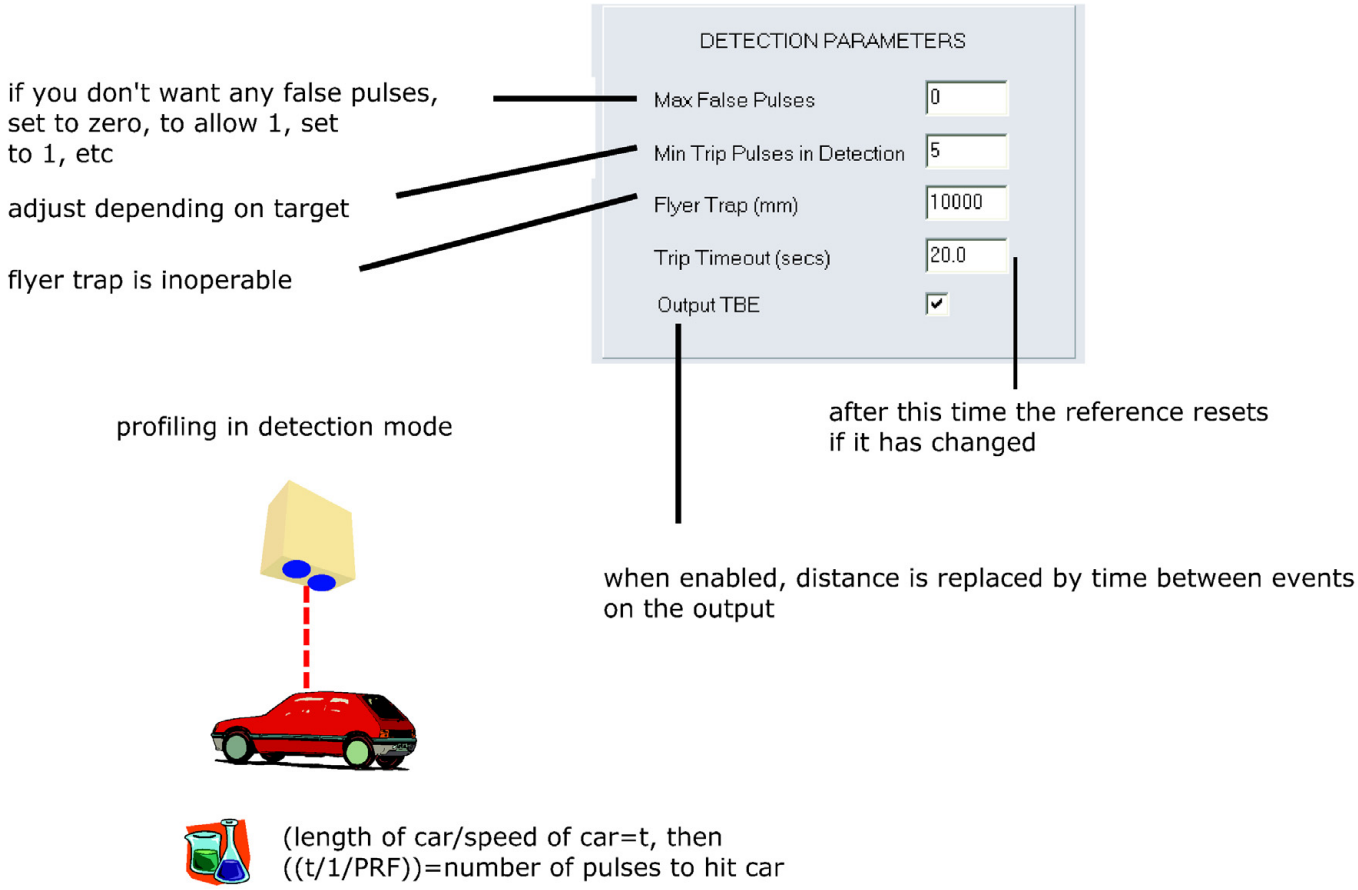
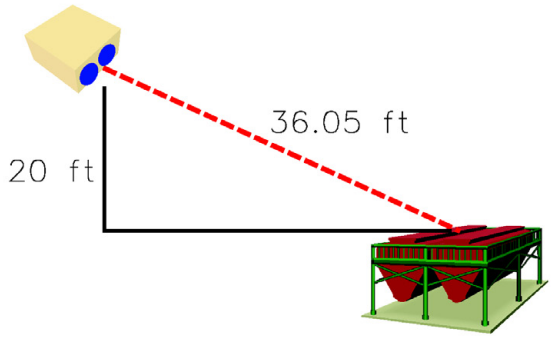
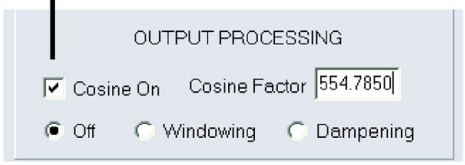

DETECTION PARAMETERS
Max False Pulses
0
Min Trip Pulses in Detection
5
Flyer Trap (mm)
10000
Trip Timeout (secs)
20.0
Output TBE
if you don't want any false pulses, set to zero, to allow 1, set to 1, etc
adjust depending on target
flyer trap is inoperable
after this time the reference resets if it has changed
profiling in detection mode
when enabled, distance is replaced by time between events on the output
(length of car/speed of car=t, then ((t/1/PRF))=number of pulses to hit car

NOTES:

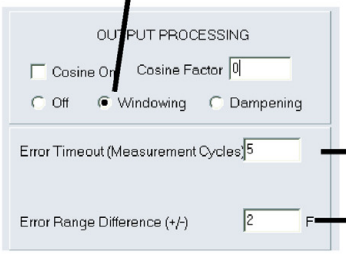
use this menu if you want to maintain a vertical distance but have to use an angled trajectory





if we want to measure a vertical distance to the bin in this example of 20 ft but our constraints force an angle measurement, enable cosine where cosine factor=(adjacent/hypotenuse)*1000 or (20/36.06)*1000=554.63

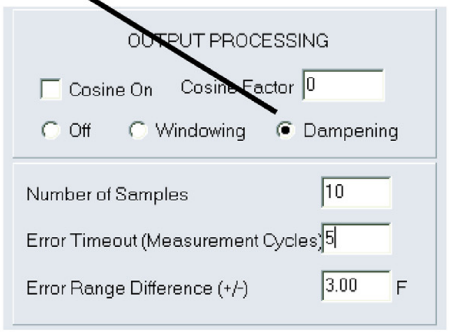
enable windowing to filter erroneous readings ensures a following measurement is within a certain distance of a previous measurement



the number of measurement errors before an error is output

the amount of range difference required to be flagged as an error

same filtering as windowing but adds a running average capability of the ranges being reported by the ULS



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resolution	1 mm
accuracy	+/-2 cm typical cooperative target +/- 4 cm typical non-cooperative target
range	0.15 to 1700 m cooperative target 0.15 to 500 m non-cooperative target
input voltage and current draw	10 to 30 VDC @170 mA
baud rate	1200 to 230400