PRESENTATION
SPEED DEVICES
TYPES OF SPEED DEVICES

- **KEYTROLLER**  
  Access-Monitoring with Speedometer—Warn—Alarm—Log

- **SPEEDTROLLER**  
  Digital Speedometer---Warn---Alarm

- **SPEED-SAVER**  
  Cable type top speed controller (For old style accelerators)

- **SPEED-SAVER EL**  
  Electronic top speed controller (For new electronic throttles)

- **TIRE-SAVER**  
  Tire/Transmission Directional Inhibitor

- **ZONETROLLER IR**  
  IR transmitter---receiver system for zone speed control

- **ZONETROLLER LZR**  
  Zone system for indoor—outdoor zone speed control

- **ZONETROLLER LP**  
  Zone system with in floor loop zone speed control
**TYPES OF SPEED SENSORS**

**GEAR TOOTH**
Hall Effect sensor pulses with each gear/space in crown gear
Hi resolution---immediate response

**MAGNETIC**
Magnetic sensor requires magnet in wheel hub
Less resolution----pulses once with every wheel revolution

**OEM**
OEM speed sensor in place from forklift manufacturer
In most cases KEYTROLLER devices can connect to this
Installation of GEAR TOOTH SPEED SENSOR

![Diagram showing installation process and ideal positions for the sensor.]

- **Ideal Position**: Gap greater than 1.5mm causing a very weak signal.
- **Not Ideal Position**: This where Sam mounted the MPU. Note the chamfer will increase the distance of the MPU from the teeth causing a weak signal.

![Image showing actual installation of the sensor.]

- **Ideal Position**: MPU is mounted at a distance of 2mm from the teeth.
- **Not Ideal Position**: MPU is mounted closer than 2mm, causing a weak signal.
KEYTROLLER LCD-601

Access Monitoring System

• Displays speed in .1 MPH or KPH
• Programmer sets speed limit (example 6 MPH)
• Programmer sets “grace period” (example 3 seconds)

• When driver exceeds speed limit—device beeps + flashes—REDUCE SPEED—during grace period!!
• If driver reduces speed within the grace period—incident is “forgotten”—not logged
• If driver does NOT reduce speed after grace period is over—120dB siren alarm sounds—will continue until forklift is under limit
• Event is logged when alarm sounds—time/date/operator/vehicle/duration of speeding event
• Emails are sent out immediately—FMS reports and graphs generated reflect speeding events.

• Although device does NOT control top speed—operator is still accountable if he speeds.
• When connected to Zone Control System and LCD auxiliary input—icon can show on LCD—Log—Shut down
Automatic emails (Speeding, impacts, failed checklists, lockouts)
Sent to smartphones
SPEEDTROLLER Forklift Speedometer

Features

- Display speed in .1 MPH or KPH
- Gear tooth or magnetic speed sensors
- Warns operator when he is speeding
- Beeps/flashes when in “grace period"
- Sounds 120dB flashing siren alarm after grace period
- Operator can cut alarm cable----NO alarm
- Fits to EL or IC vehicles
SPEEDTROLLER Forklift Speedometer Schematic
SPEED-SAVER EL  Top Speed Controller
For Electronic Throttles

- Designed specifically for electronic “Drive by wire” forklift trucks
- Proportional control makes it ideal for ramps
- Single or Dual Top Speed Settings
- HAS NO affect on low speed hydraulic performance
- Reduces tire and transmission wear
- Reduces noise--fuel consumption---damage
- Improves site safety

- Custom “plug and play” wiring looms available
- Quick fit to any forklift with electronic throttle
- Software supplied FREE with each system kit
- Programmable from laptop
SPEED-SAVER EL Top Speed Controller

Schematic---- Zone unit connection

External relay connection from Zone Receiver----sends signal to Pin 8 on EL Controller

To actuate HI and LO set speeds
SPEED-SAVER EL Top Speed Controller

Schematic----Hydraulic sensor connection

External hydraulic Sensor option connects to Pin 8 on EL Controller

Above set weight on Forklift, device slows to low speed setting.

When below hyd set point--Forklift has high speed
SPEED-SAVER EL Top Speed Controller
Laptop Software

• FREE to every purchaser
• Loads to any Windows laptop
• Connects via USB
• Allows for setting:
  1. Top speed #1 set point
  2. Top speed #2 set point
  3. Different speed for forward or reverse
  4. Set take off (ramp up—acceleration) rate
  5. Inch select—reduces RPM 50% when inching pedal is pressed (reduces clutch wear---stops driver from lifting while he inching
  6. Clone---allow settings transfer to another truck
  7. Proportional control---ideal for ramps
SPEED-SAVER Top Speed Controller
For Cable Type Accelerators----Schematic
SPEED-SAVER Top Speed Controller

How it works

- Kit includes:
  - Controller
  - “arm” actuator
  - Cable or rod connection to throttle
  - Cable linkage and hardware
  - Gear tooth sensor

- How it works:
  - When vehicle travels above idle speed setpoint, electronic “arm” restricts throttle movement and therefore engine RPM restricting vehicle top speed. Depending upon engine design, installer can use a cable or rod to control throttle stroke from the actuator.

- Why it is so great for forklifts:
  - There is NO throttle (RPM) restriction at low speed so forklift has FULL engine RPM for heavy lifting as long as he is traveling under idle speed.
TIRE-SAVER

Directional Control Inhibitor

How it works

• TIRE-SAVER can be purchased as a stand alone device or in combination with TIRE-SAVER device---in same unit.

• Kit includes:
  – Controller
  – Gear tooth sensor
  Can be purchased as a stand alone TIRE-SAVER or as an “add-on” to a SPEED-SAVER EL kit.

• How it works:
  – If forklift is traveling above speed setpoint—OR---RPM level setpoint----directional change will NOT take place until operator reduces speed and/or engine RPM

• Why it is so great for forklifts:
  1. It forces the operator to use the forklift brakes and NOT use the transmission and tires to slow the forklift and change direction
  2. Because he is using the brakes there is much less wear and tear on the transmission
  3. Because he is using the brakes to slow---most applications improve tire life by 300--400%!!
SPEED-SAVER + TIRE-SAVER Combination
Top Speed Controller with Directional Control

- Any SPEED-SAVER EL can be upgraded to include TIRE-SAVER combination
- Settings for both speed and engine RPM
- With this combination you can:
  1. Control up to two different top speeds
  2. Interface with ZONETROLLER zone speed control
  3. Control acceleration or “take off speed”
  4. Prevent driver from shifting direction if
     1. Speed is above threshold you have set
     2. Engine RPM is above threshold you have set
  5. This combination is done in one device with firmware upgrade
POWER-SAVER
Programmable Idle Shutdown

• Any SPEED-SAVER EL can be upgraded to include POWER-SAVER combination

• Adjustable idle delay from 0—1200 sec

• Shuts down engine when left idling

• Saves fuel---reduces engine wear
ZONETROLLER Zone Systems
Can be used in conjunction with

• KEYTROLLER LCD---turns on/off speed sensor input in hi/lo speed zone
• KEYTROLLER LCD---actuates auxiliary input to ---icon on LCD---shut down vehicle

• SPEED-SAVER EL---turns on/off hi/low speed settings

• SPEED-SAVER---turns on/off power to SPEED-SAVER actuator power input
ZONETROLLER IR  Infrared Zone System

How it works

1. As forklift (with IR receiver) passes through zone boundary

2. Receiver picks up a high (or low) frequency IR signal

3. Depending upon setting the IR receiver– it will:
   1. Actuate the relay (Voltage output)
   2. De-actuate the relay (No output)

4. Relay will turn on/off device depending upon set up.

5. IR beams from transmitter has range of approximately 50’ (15 meters)
Components of the system

• IR Transmitter:
  2 banks of IR LEDs
  Each bank transmits a different IR wavelengths (left and right)

• IR Receiver Module:
  Mounts to forklift---1 IR receiver on each side of module
  Embedded relay----enables power ---- disables power as forklift passes zone boundary
ZONETROLLER LZR Laser Zone System

How it works:

1. As forklift (with LASER sensor) passes outside of building
2. LASER recognizes the presence (or absence) of the building above
3. Depending upon setting the LASER transmitter— it will:
   1. Actuate the relay (Voltage output)
   2. De-actuate the relay (No output)
4. Relay will turn on/off device depending upon set up.
5. LASER unit mounts on upright column of forklift overhead guard
ZONETROLLER LP  Loop Zone System

How it works:

• 2 Wires are fed with low voltage current through our wall mounted controller/transmitter
• The signal loop is installed into the floor areas over which the forklift will run
• An Active Loop / Wire Receiver system will be installed to each forklift.
• This detection system counts and therefore knows the direction the truck is travelling
• This defines the 2 zones of low speed or high speed- system always defaults to low speed
• The system can be wired into a SPEED-SAVER – OR--fitted an in built rabbit/turtle dash switch
• If speed reduction is not required then warning devices (beacons & audible warning) can be triggered to create additional awareness to alert pedestrians that a truck is in close proximity and that they should take caution.
• When the truck detects that it has entered the high speed zone, the dash mounted indicator shows YELLOW and the operator is able to select high speed via a dash mounted push button. In this area, operator has the ability to manually toggle high/low speed at any time.
• When in high speed mode, the dash mounted indicator shows RED.
• When the truck detects that it ‘s entered the low speed zone, the dash mounted indicator shows GREEN and truck defaults to low speed, automatically slowing down gradually.
1. Many makes/models of forklifts include a HI/LO rabbit/turtle switch on the dash

2. If this dual speed switch is present---the user MAY NOT NEED our SPEED-SAVER top speed controller when trying to use the ZONETROLLER option

3. The output from the ZONETROLLER can activate the HI/LO dual speeds already programmed into the forklift.

4. With this dual switch present---system becomes less expensive.
Thank you for your interest in our products.

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