

LifeMark[®]-100

Automated Layout System

FOR PAINT TRUCKS

THE LifeMark[®]-100 AUTOMATED LAYOUT SYSTEM

consists of several components working together to provide automated control of a full-size striping truck's paint carriages. The system is designed to record pavement marking location via cameras in conjunction with RTK-corrected, accurate GPS-defined location data.

DURING LAYOUT, carriage control is achieved by the LimnTech Scientific computer control cabinet moving the carriage via a Smart Cylinder connected to the paint truck's existing hydraulic system. The existing paint truck paint gun controller system will control the on/off function of the paint guns, independent of the LifeMark[®]-100 system.

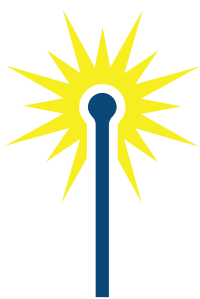
KEY COMPONENTS INCLUDED:

- Touchscreen Control Monitor
- Camera Recording System
- Two Cell Phone Antennas
- Two GPS Antennas & Towers
- Location Correction INS Device
- Smart Cylinders Mounted into Carriages
- Valve Body to Control Smart Cylinders
- Computer Control Cabinet on Deck



TOUCHSCREEN CONTROL MONITOR

The touchscreen is typically mounted via a RAM mount providing an adjustable sturdy fixture to minimize movement from vibration. The layout and size of the mounting plate can be customized to suit the truck chassis or cab configuration. The length of the post can be chosen to ensure that the monitor is close enough for the driver to use while operating, without blocking the drivers' view. The RAM system provides virtually unlimited flexibility.



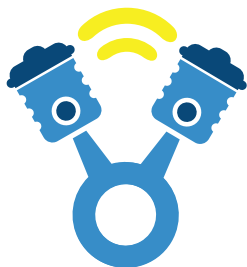
CAMERA RECORDING SYSTEM

The camera recording system includes rack or roof mounted fixed industrial cameras on each side of the truck to record marking locations. Camera field of view is wide enough that drivers simply need to stay in the lane to record and recording from both sides of the vehicle is possible.



COMPUTER CONTROL CABINET ON DECK

The LifeMark[®]-100 computer control cabinet is waterproof and mounts into an enclosure for protection and to minimize vibration. The wires from each component route to this cabinet which bolts securely to the deck floor and requires a rectangular hole through the deck to accommodate the wires. Access to the cabinet is required for servicing.



SMART CYLINDERS MOUNTED INTO CARRIAGES

The system uses Smart Cylinders to replace the existing carriage movement cylinders. These cylinders have electronic sensors that communicate the carriage position to the computer control cabinet. The cylinders are custom ordered to fit into the striping truck; existing cylinder details are required to ensure a drop-in mechanical fit. The Smart Cylinders also have electrical cables that will route to the computer control cabinet. When planning the location of the cable fitting, make sure to allow for access and ensure that carriage movement will not compromise the cables.

TWO CELL PHONE ANTENNAS

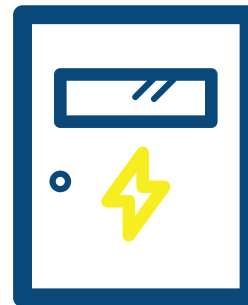
The cell phone antennas are typically mounted at a location high enough to work but remain in a safe area of the deck. They can be mounted on the top of the computer control cabinet.



VALVE BODY TO CONTROL SMART CYLINDERS

The system will typically utilize the existing striping truck hydraulics. We will install a valve body system wired to the computer control cabinet to vary the flow of the hydraulic fluid to each Smart Cylinder.

The control of each carriage requires the hydraulic system to provide sufficient fluid flow at less than 500 psi pressure.



LOCATION CORRECTION INS DEVICE

The INS device is mounted securely in a position close to the deck in a protected area. Wires run from this device to the GPS antennas and to the computer control cabinet.



TWO GPS ANTENNAS AND TOWERS

Two GPS antennas are required and must be approximately 6 feet apart in a straight line; they are typically mounted on the driver's side of the truck, securely to the deck, and bolstered by attachment to an existing fixed body, such as a compressor or guardrail. The location and size of the footplate and side mounts are custom-designed to suit the truck deck layout while minimizing vibration of the GPS antennas.

LifeMark®-100 Installation Procedures for an Existing Paint Truck

- A visit is typically required to survey the truck and to propose location choices for each sub-component. Once options are finalized, drawings are completed and shared for final approval. **Custom parts are ordered based on the truck requirements (e.g. Smart Cylinder, custom parts are longer lead times.)**
- Parts are shipped to the vendor or customer location. The mechanical assembly of the hydraulic and electrical parts onto the truck can take up to a week. The truck will typically not be operational during this time. Once all the parts are bolted into place, the truck can be operated as a normal manual striping truck. Once all LimnTech Scientific components are up and running final calibration of the truck is performed on the customer site during training.