

# Shield Payload

Low-Pressure Spraying Payload

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## Quick Start Guide



# Safety Statement

Read and understand all safety information in this section before operating the Shield Payload. Failure to comply with these warnings may result in property damage or serious injury. Always consult the Safety Data Sheet (SDS) for the specific chemical being used and follow all guidance contained therein.



## Maximum Operating Pressure

Do not exceed 160 PSI operating pressure. Exceeding the rated maximum pressure may cause component failure or chemical ejection. Verify pressure settings before each flight.



## Proximity to Structures & Buildings

Due to the nature of operating in close proximity to structures, extreme care must be taken when piloting the drone. Maintain awareness of surrounding architectural features, walls, overhangs, and obstacles at all times. Be mindful of where overspray may carry — wind direction and speed can cause chemical drift onto unintended surfaces, vehicles, or bystanders. Overspray from sealers can permanently stain or damage surfaces not intended for treatment.



## Chemical Exposure & SDS Compliance

This payload may be used with a variety of **concrete** sealers and coatings. Always obtain and review the Safety Data Sheet (SDS) for the specific chemical in use prior to operation. Follow all PPE requirements, exposure limits, first-aid procedures, and disposal instructions specified in the SDS.



## Environmental Conditions

Do not operate in winds exceeding the drone manufacturer's recommended limits, or when wind conditions could cause uncontrolled chemical drift. Be mindful near bodies of water, storm drains, or sensitive vegetation unless appropriate containment measures are in place.



## Pre-Flight Inspection

Inspect all hose connections, fittings, the pump, and nozzle for leaks, cracks, or wear before every flight. Do not operate with damaged components. Ensure the long lance is fully seated and locked in place, and that all FPV camera fasteners are tightened securely.

# Setup Guide

## 2.1 PAYLOAD INSTALLATION

Mount the Shield Payload to the Lucid Bots Sherpa 1.5 using the steps below. Ensure the drone is powered off and on a stable, level surface before beginning installation.

- 1 Power off the Sherpa 1.5 and place it on a flat, stable surface.
- 2 Using the provided M5 handnuts, install the front and rear fasteners onto the drone frame, leaving the middle fasteners off for now.



- 3 With the payload oriented as shown — valve assembly facing the underside of the drone body and the supply hose toward the rear — align the front slots of the payload baseplate onto the front fasteners. Slide the payload all the way forward, then align the rear slots onto the rear fasteners.



- 4 Install the middle fasteners and tighten all six handnuts until the payload is secured. There should be no movement when gently pushing or pulling on the payload.



- 5 Power off the Sherpa 1.5 and place it on a flat, stable surface.

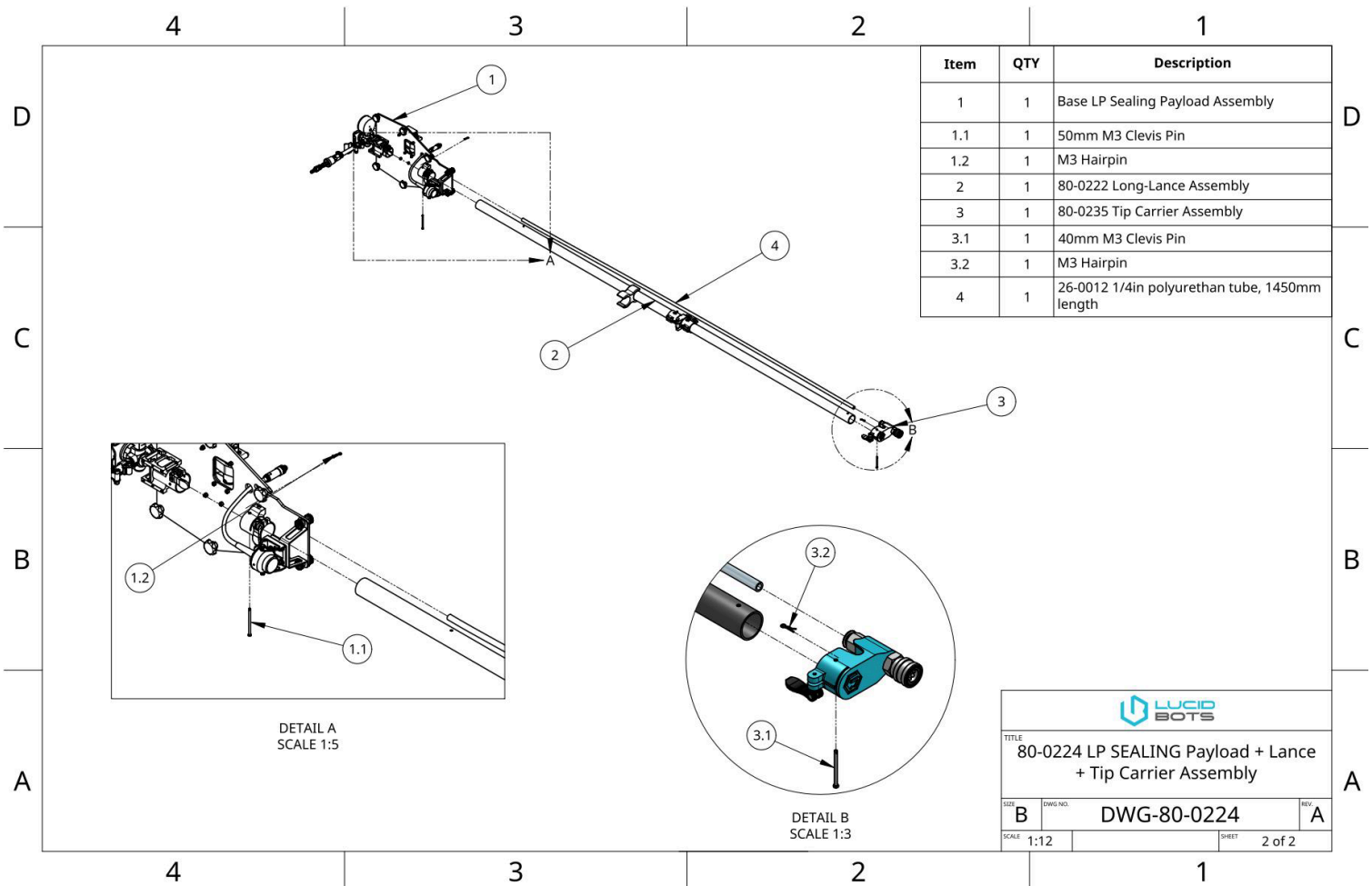


- 6 Using the provided M5 handnuts, install the front and rear fasteners onto the drone frame, leaving the middle fasteners off for now.



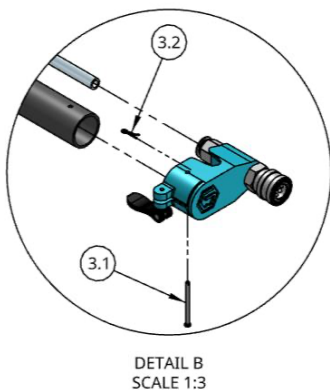
## 2.1 PAYLOAD INSTALLATION – LANCE

- 7** Install the lance onto the payload as shown in the drawing below. Pass the lance base through the tube brackets until it is fully seated in the rear bracket. Secure the lance in the front bracket using the tethered clevis pin and hairpin. Close the front two cam locks together, followed by the rear cam lock. The lance should feel secure within the brackets. If it does not, tighten the cam lock fasteners as needed.



- 8** Slide the tip carrier onto the end of the lance, securing it with the M3 clevis pin and hairpin. Clamp the lance tube by tightening the cam lock.

- 9** Install the tube segment between the valve and tip carrier, securing the middle portion to the lance with the TPU straps.



## 2.2 PUMP CONNECTION

The ground-based pump pressurizes the sealant mixture and sends the fluid up the supply hose to the drone. The pump should be capable of 130–160 PSI at a flow rate of 1.8 GPM.

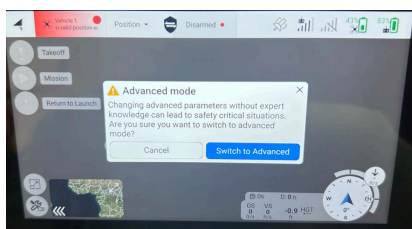
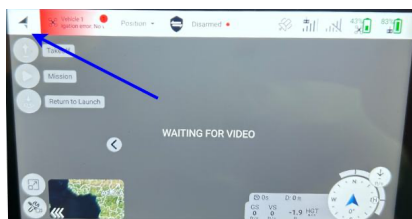
- 1 Mix the sealer as directed by the TDS of the manufacturer. Store in a tank or reservoir that the pump inlet line can be dropped into.
- 2 Place an inlet line with filter into the fluid tank and connect to the inlet of the pump.
- 3 Connect the Flexzilla hose (or equivalent hose) to the outlet of the relief valve and the 1/4" quick-disconnect side to the drone payload.

## 2.3 COLLISION PREVENTION

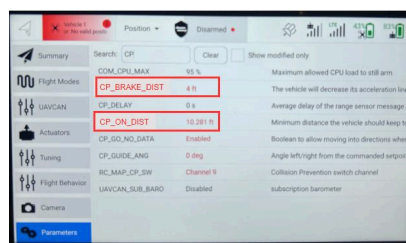
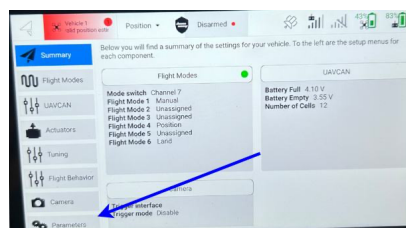
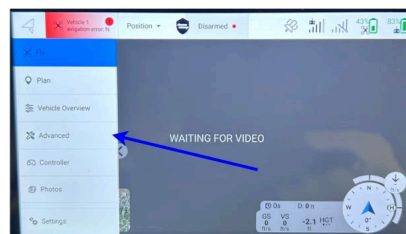
Because sealing operations often take place in close proximity to structures, configuring collision prevention settings in the Sherpa 1.5 controller is a critical step before every job. Proper setup helps protect both the drone and surrounding surfaces.

- 1 Power on the Sherpa 1.5 as well as the controller.
- 4 Also set CP\_BRAKE\_DIST to 2.1 m. It should also appear red once the new value is written.

- 2 Upon connection of the controller to the drone, activate advanced mode by pressing the upper left-hand corner of the screen repeatedly. When prompted, select Switch to Advanced.



- 3 In Advanced → Parameters, type "CP" to search collision prevention parameters. Set CP\_ON\_DIST to 2.13 m (7 ft). Once changed, the parameter should appear red to indicate a new value has been written.



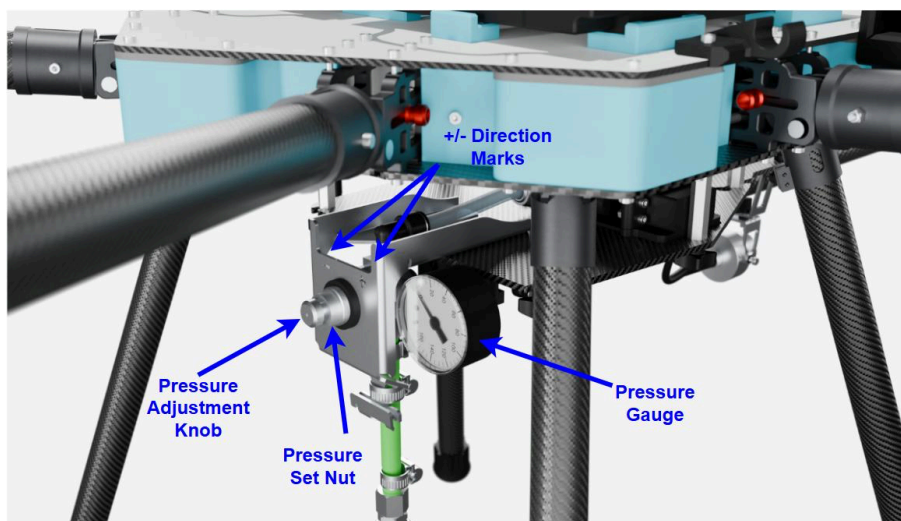
- 5 Clear the "CP" from the search bar so the Tools button appears. Press Tools and then select Reboot Vehicle from the menu that appears.

# Operation

## 3.1 SETTING THE FLUID PRESSURE

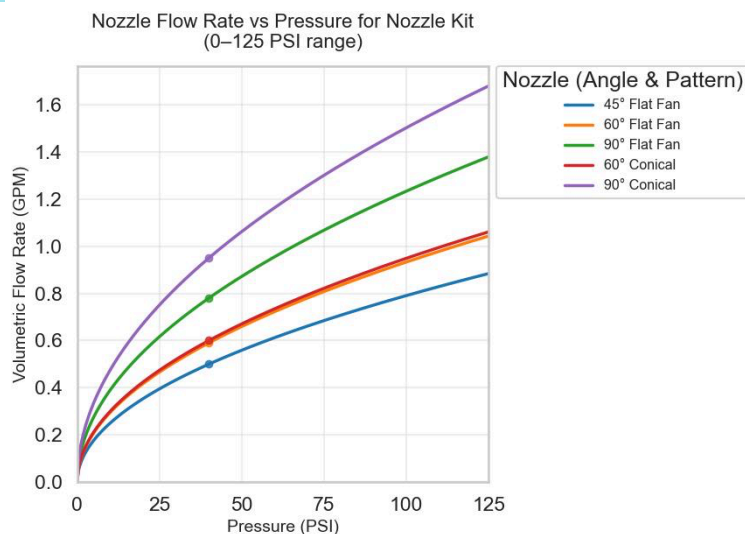
The shield payload is designed to maintain a constant flow rate at the nozzle as the drone flies to the various altitudes required by an application. It achieves this through the use of an onboard pressure regulator. The regulator allows the pump to overpressure the supply line to overcome hydrostatic pressure loss, while holding the pressure at the payload nozzle constant. Though many repellants require approximately 40 PSI, various repellants may require different pressures. The onboard regulator can be adjusted between 0–125 PSI. The pressure can be set using the following process.

- 1 Loosen the pressure set nut at the base of the adjustment knob.
- 2 Increase the pressure with a clockwise rotation toward the plus symbol. Alternatively, decrease the pressure with a counter-clockwise rotation toward the minus symbol. Use the pressure gauge to view the current pressure, but note that fluid must be actively flowing for the pressure to be set correctly.
- 3 Once the desired pressure is achieved, tighten the pressure set nut to ensure the adjustment knob cannot turn under vibration loads during flight.



## 3.2 SETTING THE FLUID FLOW RATE VIA NOZZLE SELECTION

The standard nozzle kit provides five different nozzle offerings with various flow rates. The flow versus pressure characteristics of each are shown in the graph below. The higher the flow rate, the faster the drone can be flown to cover a given area. However, a higher fluid discharge can also mean less precise application. The exact nozzle selection is left to the preference of the user.



### 3.3 IN-FLIGHT CONTROL

The ground-based pump pressurizes the chemical mixture and sends the fluid up the supply hose to the drone. The pump should be capable of 130–160 PSI at a flow rate of 1.8 GPM. The pump requires a relief valve on the output side that will direct fluid back into the tank in the event of an overpressure.

#### Fluid Flow On/Off

Uses the standard Spray control lever on the right side of the Sherpa 1.5 controller.

#### Relative Position

The ideal nozzle distance for most applications is 2–3 ft from the facade. It is also important to remain relatively perpendicular to the wall in the yaw axis.

#### Collision Prevention

When configured for close proximity to structures as covered in Section 2.3, the nozzle can be controlled in position mode to a distance of 2–3 ft from the structure. Note that step changes in the surface of the facade should be monitored carefully, as larger steps can lead to a sudden loss of positive translational movement in the forward (+X) direction.

## SECTION 4

# Clean-Up & Maintenance

### 4.1 SYSTEM FLUSH

After each use, the payload system must be flushed to prevent chemical from curing inside the hoses, pump, regulator, or nozzle. Failure to flush the system promptly after use may result in blocked components and reduced service life.

- 1 After completing the application, turn off the pump and relieve any remaining line pressure before disconnecting any fittings.
- 2 Replace the chemical supply with clean water, or a cleaning agent recommended by the Technical Data Sheet (TDS) of the sealer in use.
- 3 Run the pump and activate the spray to flush the cleaning fluid through the entire system — from the inlet line, through the pump, regulator, hose, lance, and out through the nozzle — until the discharge runs clear.
- 4 Turn off the pump and relieve line pressure. Disconnect the supply hose from the payload and allow any remaining fluid to drain.
- 5 Wipe down the exterior of the payload, lance, and tip carrier with a clean cloth to remove any residual chemical or overspray.

#### Cleaning Agent

Always refer to the TDS of the specific chemical in use for the manufacturer's recommended cleaning agent and procedure. Some products may require a solvent-based cleaner rather than water. Follow all handling and disposal instructions for the cleaning agent as specified in its SDS.