



Advanced Remote Sampling Tool Owner's Manual



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Safety

ChemThief[®] incorporates a patented design for use by a robot to collect and package a solid or liquid sample in areas too hazardous for humans.

It is the user's responsibility to survey all hazards and provide protection through on site administrative controls, engineering controls and/or personal protective equipment (PPE).

Robot operation may cause hazardous materials to spread to locations other than the original hazardous area.

The ChemThief[®] lance tip and any broken glass from the sample container are sharp and may be contaminated by hazardous material. Avoid injury and exposure to hazardous materials through laceration or puncture of PPE by sharp components.

ChemThief[®] is not rated as intrinsically safe. Do not use ChemThief[®] in potentially explosive or flammable environments.

User assumes all risk for use of ChemThief[®].

Overview

ChemThief[®] is a patent-pending device that enables a robot operator to collect, containerize and transport solid, liquid and multiphase samples without exposing humans to a hazardous environment.

ChemThief[®] can collect samples in the open, including soil samples, and pierce light containers with a stainless steel lance.

ChemThief[®] uses an adaptable gripper mount to function across any robot platform able to carry a five-pound payload. A self-contained battery operates a programmed sequence of movement to collect and then expel a sample material into a container. The sample collection volume is designed to meet the Environmental Protection Agency's All Hazards Receipt Facility Screening Protocol of 2 g of solid or 2 ml or liquid. The sample is transported in a non-reactive glass container with a sealed lid for testing or repackaging in a safe, controlled area.

The robot operator controls the action of ChemThief[®] through a pulse signal from any robot circuit with 5-24 V power. When ChemThief[®] receives the pulse, the self-contained battery powers a factory programmed cycle of movement. These movements cause the sample to be collected or expelled. A green LED actuator motion indicator on top of ChemThief[®] signals cycle status to the operator through robot camera view.

After a sample has been collected, the operator maneuvers the lance tip over the sample container on the ground or foam base. A pulse signal from the operator expels the sample into the non-reactive Petri dish.

Packaging occurs when the operator maneuvers the collector to magnetically reconnect the container to the collector.

Case Contents

ChemThief[®] includes a carry case with a protective foam insert to securely store all components and supplies except the foam base. Extra cutouts are included to store an optional Rebuild Kit and Replenish Kit to support extended operations.

Components

ChemThief[®] uses consumable supplies with three pieces of durable equipment: Base, collector and container. The collector is held in the gripper with the container attached under the collector with magnets. The foam base is used as a clean work surface. The base has a void that allows it to be hung over the collector/container held in the gripper. The three components are transported in this manner.



Figure 1 – ChemThief[®] case contents.

Base

The foam base is a lightweight, optional accessory, used to provide a clean work area. The bottom of the base is coated with a slip resistant coating for smooth floor surfaces such as vinyl or finished concrete. The red trim provides visual contrast for the operator when disconnecting the container module.

If the base is to be used, ChemThief® is first secured in the gripper, connected to the appropriate circuit with the signal cable and then tested. Orient ChemThief® to point up, about 20 – 40 degrees above horizontal and hang the foam base over ChemThief®.

The base may be transported after sample collection or it may be abandoned.



Figure 2 - Foam base.

Collector

The unique design of the collector uses cycled movements to collect or expel any solid, liquid, powder, paste, gel, oil or mixture into a sealed container for transport. The stainless steel lance provides a way to scoop, core or pierce. The green LED actuator motion indicator signals the cycle status to the operator through a robot camera.

Solid samples are collected using the lance to scoop or core an approximately two-gram sample into the lance barrel. Once maneuvered above the container the collector is inverted so that the lance bevel is oriented downward. A cycle is initiated and the lance plunger clears the lance barrel, expelling the solid into the container. This assures a “sticky” solid will not hang up in the lance.

Liquid samples require two cycles. The lance is placed into a liquid so that the lance bevel is completely immersed either in a pool of liquid or through a light container. The operator initiates a cycle and liquid is drawn up the lance by a pipet. When the green LED actuator motion indicator indicates the cycle is complete the operator maneuvers the collector above the container and initiates a second cycle that expels the liquid into the container.

The green LED actuator motion indicator will signal the operator to indicate status of the cycle of motion in ChemThief®:

1. The first phase is indicated by the green LED lit as a steady light. The lance plunger is moving forward and the pipet bulb is being collapsed. A pause is included in this phase to allow for the slower flow of thick and sticky liquids.
2. The second phase is indicated by the green LED flashing at a moderate rate. The lance plunger is retracting and the pipet bulb is expanding. A second pause is included for thick liquids.
3. The third phase is indicated by the green LED flashing rapidly. This is a third pause in addition to the second pause because thick liquids require more time to be drawn into the pipet than to be expelled.
4. The fourth phase is indicated when the green LED stops flashing. ChemThief® is now ready to cycle again. The cycle is the same whether collecting or expelling a sample.

Multiphase samples such as sludge, mud, slurry or insoluble solid spilled in a liquid are collected and containerize in the same way liquids are manipulated.

The axis of the lance should be maintained downward from horizontal. If the lance is oriented above horizontal, excess low viscosity liquid in the lance bevel can migrate between the pipet stem and lance plunger to the interior of ChemThief®.

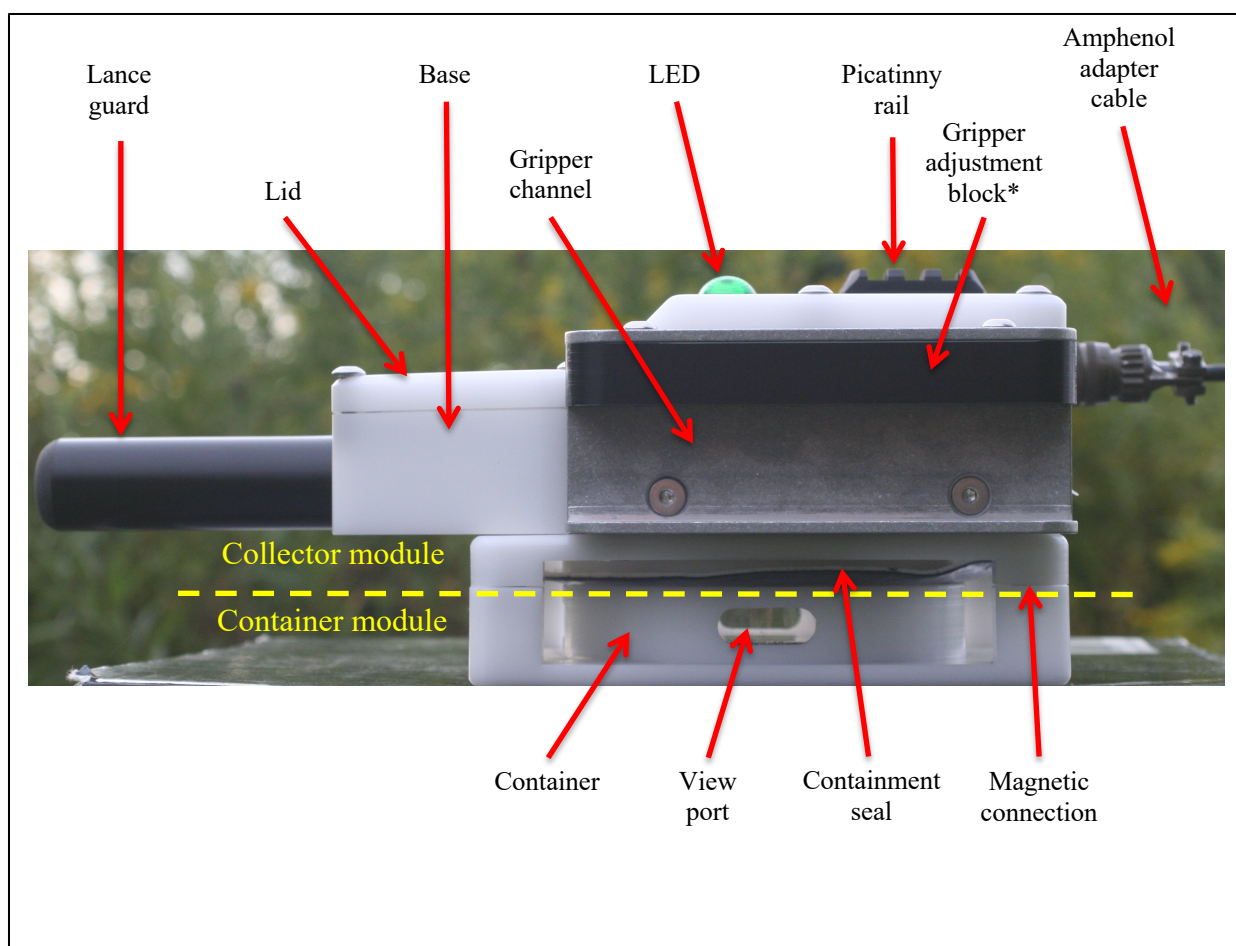


Figure 3 – ChemThief® collector and container components. *Gripper adjustment blocks vary to fit the robot gripper specified by the owner.

Container

At the sample collection site the non-slip foam base is placed on the floor or ground. The gripper pulls the collector/container assembly from the foam base. The operator maneuvers to place the container portion of the assembly in a void surrounded by red trim on the foam base. Then the operator causes a sideways movement of the gripper and collector, which shears the magnetically connected container away from the container. The container module is left in the clean area of the base while the sample is collected.

The gripper and collector are maneuvered to collect a sample, which is then expelled into the Petri dish in the container module.

The next step is magnetically reconnecting the container module to the collector. When the collector is close the magnets self-align and the container magnets “jump” to meet the collector magnet. A non-reactive containment seal seals from above is pressed over the Petri dish and sample. A compression disk below the Petri

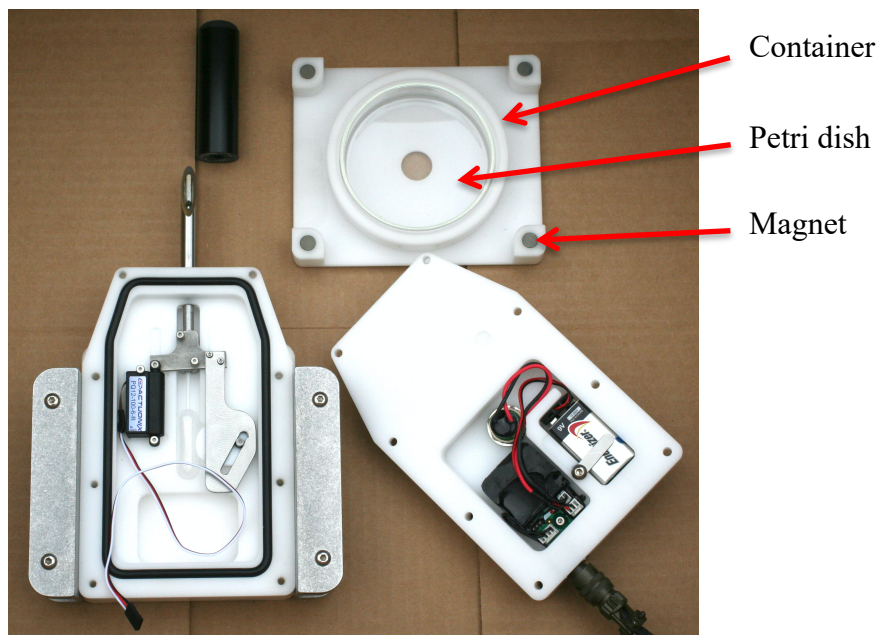


Figure 4 - ChemThief® container module components.

dish provides mild pressure to hold the Petri dish edge against the non-reactive containment seal. The sample is now packaged for transport. The foam base may be picked up and transported with the sample or it may be abandoned until later.

In a safe and controlled area a worker can view the sample through one of four ports in the side of the container unit. With appropriate personal protective equipment the same worker can manually shear the magnets and remove the container from the collector. The sample is now available for testing or repackaging as needed.

Consumable Items

ChemThief® uses consumable and disposable components. Some component may be reused and the decision to do so is left to the owner.

- Lance O-rings
- Pipets
- Base O-rings
- Containment seals
- Petri (glass) dishes
- Cotton swabs
- Pipe cleaners
- Lubricant

Operation

Before Use Procedure

1. Remove ChemThief[®] from the case.
2. Remove the lid and install a fresh 9V battery.
3. Replace the lid and tighten the lid screws finger tight.
4. Install a containment seal on the containment lid of the collector module if one is not already in place.
5. Place a Petri dish in the container module.
6. Magnetically attach the container module to the collector module.
7. Connect the Amphenol adapter cable to ChemThief[®] and the robot.
8. Remove and stow the lance guard in the case foam cutout.
9. Inspect lance for debris.
10. Test the motion of ChemThief[®] and observe movement.
11. Secure ChemThief[®] in the gripper, using gripper adjustment blocks as needed.
12. Orient ChemThief[®] to point upward, about 20 - 40 degrees above horizontal.
13. Hang the foam base over ChemThief[™].

Downrange Set Up Procedure

1. Drive robot with ChemThief[®] downrange and place the foam base (optional). Consider proximity to collection site, robot workspace and foam base stability.
2. Position ChemThief[®] over the foam base and perform arm movements to lower the container module into the void outlined with red. The use of two or more camera views, including a second robot view, will be helpful to accomplish this.
3. Lower the robot arm to place slight pressure between the container module and the foam base.
4. Separate the container module by shearing the magnetic connection to the collector module, using a lateral arm movement to “scrape” the collector module away from the container module. A slight downward roll of the robot wrist in the direction of the arm movement can be helpful. If a lateral arm movement is not possible, consider extending or retracting the gripper or driving the robot forward or backward to effect the shearing movement.



Figure 5 - Container module placed in the foam base before sample collection.

Sample Collection Procedure

Warning: Failure to conduct a complete threat assessment before use of ChemThief® may result in a dangerous condition. Threat assessment is the responsibility of the owner. This manual concerns the operation of ChemThief® only.

Operation of the robot varies based on whether the unknown material is in a container or in the open. Operation of ChemThief® is determined by whether the unknown material is solid or liquid (use the liquid procedure for multiphase material). View the material to be sampled and select the appropriate procedure below.

Solids

1. Use the lance to scoop or core a solid sample. Lift the lance tip so it is angled slightly **above** horizontal and avoid bouncing movements.
2. Maneuver the lance over the Petri dish in the container module so that the sample does not spill.
3. Rotate the robot wrist 180 degrees so that the lance opening is toward the Petri dish.
4. Initiate a ChemThief® cycle and observe the sample as it is ejected into the Petri dish. Monitor the green LED for confirmation of a complete cycle of movement.
5. If the sample in the dish is adequate, go to the packaging procedure. Otherwise, repeat the sample collection until the sample volume is acceptable.

Liquids

1. Submerge the lance opening completely in the liquid. Failure to do so may allow air to be drawn into the pipet rather than liquid.
2. Initiate a ChemThief® cycle and observe the green LED. Bubbles may be visible as air from the pipet is expelled. The first LED signal indicates ejection of air from the pipet. The second LED signal indicates liquid being drawn into the pipet. The third LED signal is a waiting period to assure thick liquids have time to be fully drawn into the pipet.
3. Remove the lance tip from the liquid. Keep the lance oriented **below** horizontal to prevent seepage of thin liquids along the barrel of the lance to the interior of ChemThief®. The pipet is engineered to minimize or eliminate drips when pointed downward.
4. Maneuver the lance so the axis points straight down over the Petri dish in the container module. Lower angles will release most liquid, but the pipet bulb will empty completely when pointed straight down.
5. Initiate a ChemThief® cycle and observe the green LED to completion.
6. If the sample in the dish is adequate, go to the packaging procedure. Otherwise, repeat the sample collection until the volume is acceptable.

Piercing Containers

The ChemThief® lance is made from stainless steel and sharpened to pierce light containers such as cardboard and plastic. Containers that offer more resistance can be opened by other means and then sampled accordingly. For example, a glass container can be smashed into an open container in a separate operation. A plastic barrel can be drilled and then the lance may be inserted through the opening.



Figure 6 - Maneuvering ChemThief® to pierce the top of a container.



Figure 7 – Top view of ChemThief® lance opening placed just below the liquid surface to minimize leakage.

A pierced container will leak down to the level of the opening. The preferred method is to sample from the top of the container through the cap, lid or other flat portion. A downward piercing motion uses the floor to hold the container against the force of the robot. A downward orientation assures liquid cannot migrate along the barrel of ChemThief® and contaminate the interior.

If a downward approach does not work, a small container will need a backstop, such as a wall or a heavy object, during a horizontal approach. The lance approach should be horizontal or slightly downward. The removal motion must maintain the alignment of the lance so that the container does not drag on the lance as it is removed.

To minimize liquid leakage from the container, make the first horizontal piercing movement near the top of the container. Continue piercing lower on the container until the liquid level is determined. If leakage is not a consideration, make the first piercing near the bottom of the container.

When the contents have been determined to be solid or liquid, use the appropriate procedure above to collect a sample.

Packaging a Sample

1. Maneuver the collector module over the container module so that the magnets roughly align.
2. Use fine movements to more closely align the magnets until all four connections are secure.
3. Drive the robot and ChemThief® to a designated area to recover the sample. The foam base may be retrieved or abandoned until later.
4. At the designated area a person in appropriate personal protective equipment may view the sample through the four view ports in the container module. The sample may be

tested through the view port with Raman, gamma and radioisotope identifier instrumentation.

5. Being careful of the sharp, contaminated lance, the person may retrieve the sample by manually shearing the magnetic connections. The sample is now available for field testing or it may be repackaged for testing in another location.

Training Suggestions

ChemThief® is an advanced robotic tool. It may be helpful to break training into these modules before attempting a full exercise.

Set Up and Magnetic Connection

Practice placing and retrieving the foam base. Next, practice separating and connecting the collector and container modules on the foam base. Finally, practice breaking and making the magnetic connection without the foam base. Try a variety of surfaces, such as soil, rough concrete, painted floor, smooth tabletop, etc. Small steps will build skill and confidence. Start by operating the robot from a tether, then remotely while pausing to take a look and then with robot camera views only.

If the foam base slips on a smooth floor, try using Breachers or HydroGel Tape (double-sided tape) on the bottom of the foam base. However, the tape might not be removable.



Figure 8 - Double-sided HydroGel and Breachers Tape.

Collecting a Sample

Practice on safe samples in the open from a dish of liquid (water, glycerin, rubbing alcohol) and solids on the floor (sand, flour, wax). Practice scooping and coring solids and drawing up thick and thin liquids. Use the same steps: tether, “remote-and-peek” and then full remote operation.

Piercing a container is the next step. It is important to note that the lance operates most efficiently if the lance maintains its axis as it is pushed through the container. Changing the angle of the wrist or using an arcing motion from the arm will make withdrawal of the lance difficult. Remember to keep the lance pointed at or below horizontal to prevent liquid from seeping into ChemThief®.

Start with empty light containers from top down and then from the side with and without a backstop. The lance should be pushed through the container and not hammered. Hitting a hard container, especially at an angle off the lance axis, may bend the tip of the lance. Minor repair of a bent lance tip may be made by bending the point back in line with the bevel and then filing to maintain a sharp edge.

Try a full container to see how added mass will affect the piercing function of the lance. ChemThief® cannot pierce heavier containers, such as a steel gas can or 55-gallon drum. Heavier containers should be drilled or pierced so that the lance of ChemThief® can be inserted in a second operation.

Practice expelling the sample into the sample container and watch how thin and thick liquids and various solids differ.

Sample Testing

If Raman instrumentation is available, practice scanning known solids or liquids through the view port before opening the sample container. Strongly Raman responsive materials include glycerin, acetone, ammonium nitrate and others.

Use the robot to tilt a view port downward so that the sample drops into view. The increased thickness of the Petri dish will likely require removing a nosecone or other adaptation to project the laser focal point into the sample.

Gamma radiation testing may be performed before opening the sample container. Gamma radiation will not be significantly reduced by the borosilicate Petri dish or the Delrin plastic containment base.

Radioisotope testing may be performed before opening the sample container. Most radioisotopes are identified in the field by gamma characteristics.

Maintenance

ChemThief[®] may be cleaned or decontaminated by following the following procedures. Some contaminants, such as chemical warfare agents, may require decontamination efforts that are dangerous or not cost effective compared to some or all ChemThief[®] components. Use and decontamination of ChemThief[®] are performed solely by the owner, who assumes all risk.

ChemThief[®] is completely field serviceable. All components, including electronics, are individually field replaceable and cleanable or are considered consumable, such as polyethylene pipets. Maintenance is described below for the collector, container and base.

Disassembly and reassembly procedures are described by each subsystem within ChemThief[™]. Choose one or more procedures dependent on the level of repair, cleaning or decontamination necessary. Adapt the procedure as might be necessary for a particular situation.

Decontamination

The chemical and physical properties of the contaminant drive the decontamination requirements. Decontamination is the responsibility of the owner and is performed solely at the risk of the owner.

Base Maintenance Procedure

The base is a single component and disassembly does not apply.

1. Clean off any non-hazardous material for reuse. The foam is porous and if exposed to a hazardous material cannot be fully decontaminated. The decision to clean or replace the base is the responsibility of the owner.
2. Store the base in a clean and dry location.

Container Maintenance Procedure

Disassembly

1. Disconnect the container module from the collector module by shearing the magnet connection. Be careful not to drop the Petri dish.
2. Remove the Petri dish and clean or replace. The Petri dish may be reused if clean.
3. Inspect and clean the container module as necessary.
4. Contact customer service if replacement parts are needed.

Reassembly

1. Do not store a Petri dish in the containment base in combination with a containment seal adhered to the containment lid. The foam in the containment seal will distort and may not realign later with the Petri dish, possibly allowing a leak.
2. Once the collector module has been maintained, magnetically reattach the container module to the collector module for storage in the case.

Collector Maintenance Procedure

General Disassembly of Collector Module

1. Disconnect the Amphenol adapter cable between ChemThief® and the robot.
2. Remove ChemThief® from the robot gripper.
3. Remove four short screws and four long screws from the lid.
4. Lift the lid from the base and carefully disconnect the 3-lead connector from the pin base.
5. Remove the 9V battery from the base and disconnect.

Next, use the subsystem procedure required.

IMPORTANT: Screws must not be over torqued. Over tightening screws may strip the threads and is not covered by warranty. Do not use any tools other than those provided with ChemThief®. During reassembly each screw is tightened to one of these descriptions:

- **Finger tight:** Snug down the screw using the appropriately sized driver with your fingers. Do not use an extension or handle other than the screwdriver included in the case.
- **Contact:** Tighten the screw until the components come together and then loosen about ¼-turn to assure non-binding movement.
- **Firmly:** You may use a handle or extension to tighten a metal-to-metal connection.

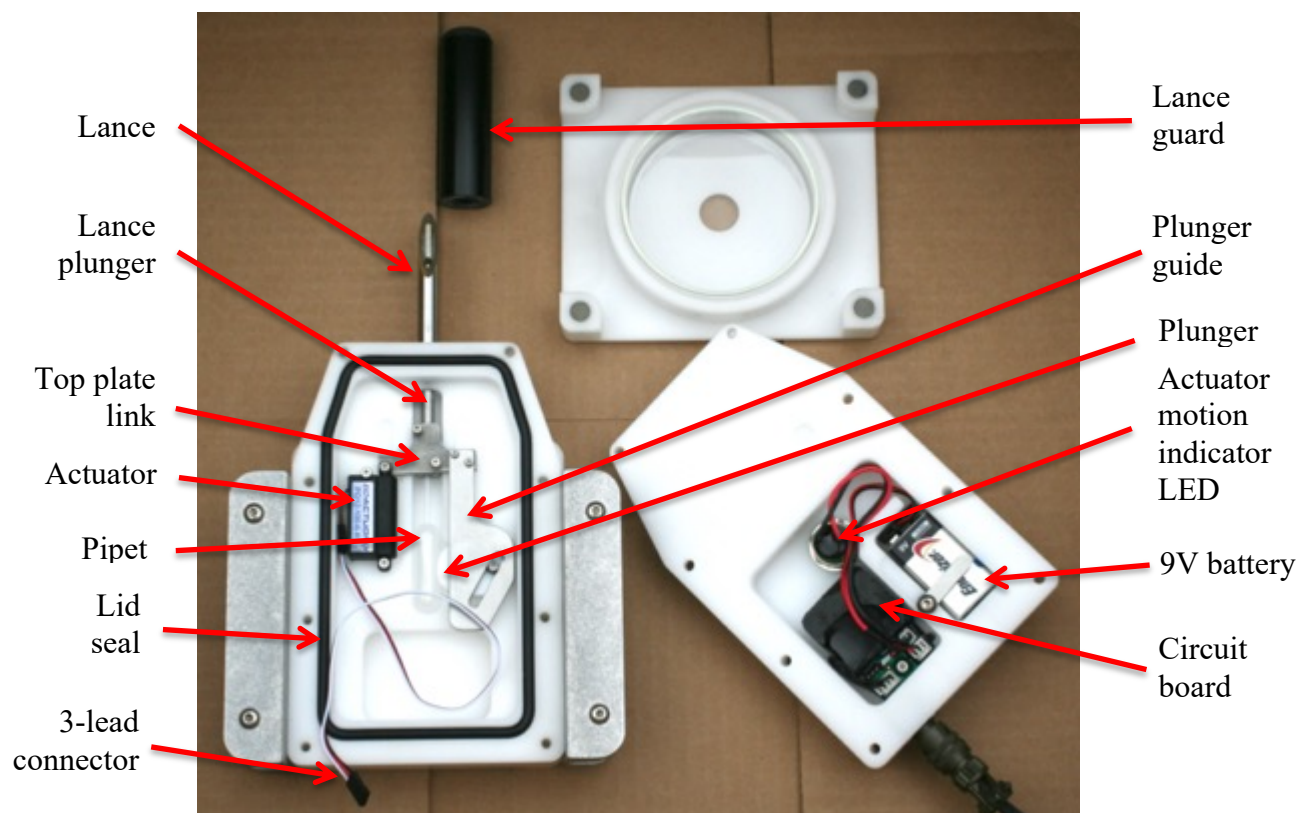


Figure 9 - Interior view of collector module components.

After Use Maintenance

Disassembly

1. Remove two screws from the plunger guide (keep track of screws for accurate replacement)
2. Remove the plunger guide and plunger.
3. Remove the pipet and discard.
4. Remove two screws connecting the top link plate link and lance plunger.
5. Remove the screw connecting the actuator piston to the top link plate and remove the top link plate.
6. Slide the lance plunger out of the lance and set aside.
7. Remove two lance screws connecting the lance and the base.
8. Carefully remove the lance from the recess in the base. Be careful of the sharp lance tip.
9. Remove the lance plunger O-ring in the base.
10. Remove the base O-ring between the base and lid.
11. Inspect, clean all components as necessary. The lance bore may be cleaned with cotton swabs. The lance plunger bore may be cleaned with a pipe cleaner.
12. When satisfied that all components are clean and in working order, use a thin coat of lubricant on the base O-ring, lance plunger O-ring, the exterior of the lance plunger barrel and the post on top of the plunger.

Reassembly

1. Install the base O-ring.
2. Install the lance O-ring in the recessed area in the plastic body.
3. Install the lance, bevel side up and install two screws finger tight.
4. Place the lance guard over the lance.
5. Slide the lance plunger into the lance.
6. Slide the top link plate over the lance plunger and below the actuator piston. The side with one hole will connect to the actuator piston.
7. Install two screws finger tight to connect the top link plate with the lance plunger.
8. Install the screw through the actuator piston and tighten to contact.
9. Install a pipet.
10. Install the plunger.
11. Install the plunger guide by placing the slot over the plunger post and then aligning the two holes over the top link plate.
12. Install two screws finger tight.
13. Connect the 3-lead connector to the 3-pin connector on the lid. The white wire should be closest to the wall. Be careful not to bend the pins. Coil the cable into the void so that it is not pinched under the lid and does not impede the movement of components.
14. Attach the Amphenol adapter cable.
15. Install a 9V battery.

16. Use the robot to test the motion of ChemThief®. If the actuator binds, check for over tightened screws. Reassembly of this subsystem is complete when ChemThief® cycles through a motion smoothly.
17. Remove the 9V battery before storage.

Actuator Replacement

1. Access the interior of ChemThief as described above in *General Disassembly of Collector Module*.
2. Remove the screw connecting the actuator piston to the top link plate.
3. Remove front and rear mounting screws from the actuator.
4. Remove the actuator.
5. Start the forward (longer) mounting screw into the base a couple of turns.
6. Gently press the new actuator into the base with the forward mounting screw in the groove in the front of the actuator.
7. Install the rear mounting screw a couple of turns.
8. Install the piston screw through the actuator piston into the top link plate finger tight.
9. Alternate turning the front and rear mounting screws until contact.
10. Connect the 3-lead connector to the 3-pin connector on the lid. The white wire should be closest to the wall. Be careful not to bend the pins. Coil the cable into the void so that it is not pinched under the lid and does not impede the movement of components. Install the 9V battery.
11. Attach the Amphenol adapter cable.
12. Use the robot to test the motion of ChemThief®. If the actuator binds, check for over tightened screws. Reassembly of this subsystem is complete when ChemThief® cycles through a motion smoothly.
13. Remove the 9V battery before storage.

PCB Controller Replacement

1. Access the interior of ChemThief as described above in *General Disassembly of Collector Module*.
2. Remove the three pin connectors.
3. Remove the screw on the printed circuit board (PCB) controller.
4. Remove the circuit board.
5. Attach the new PCB controller to the base with the screw finger tight.
6. Reconnect the pin connectors. Be careful not to bend the pins.
7. Install the 9V battery.
8. Attach the Amphenol adapter cable.
9. Use the robot to test the motion of ChemThief®. If the actuator binds, check for over tightened screws. Reassembly of this subsystem is complete when ChemThief® cycles through a motion smoothly.

10. Remove the 9V battery before storage.

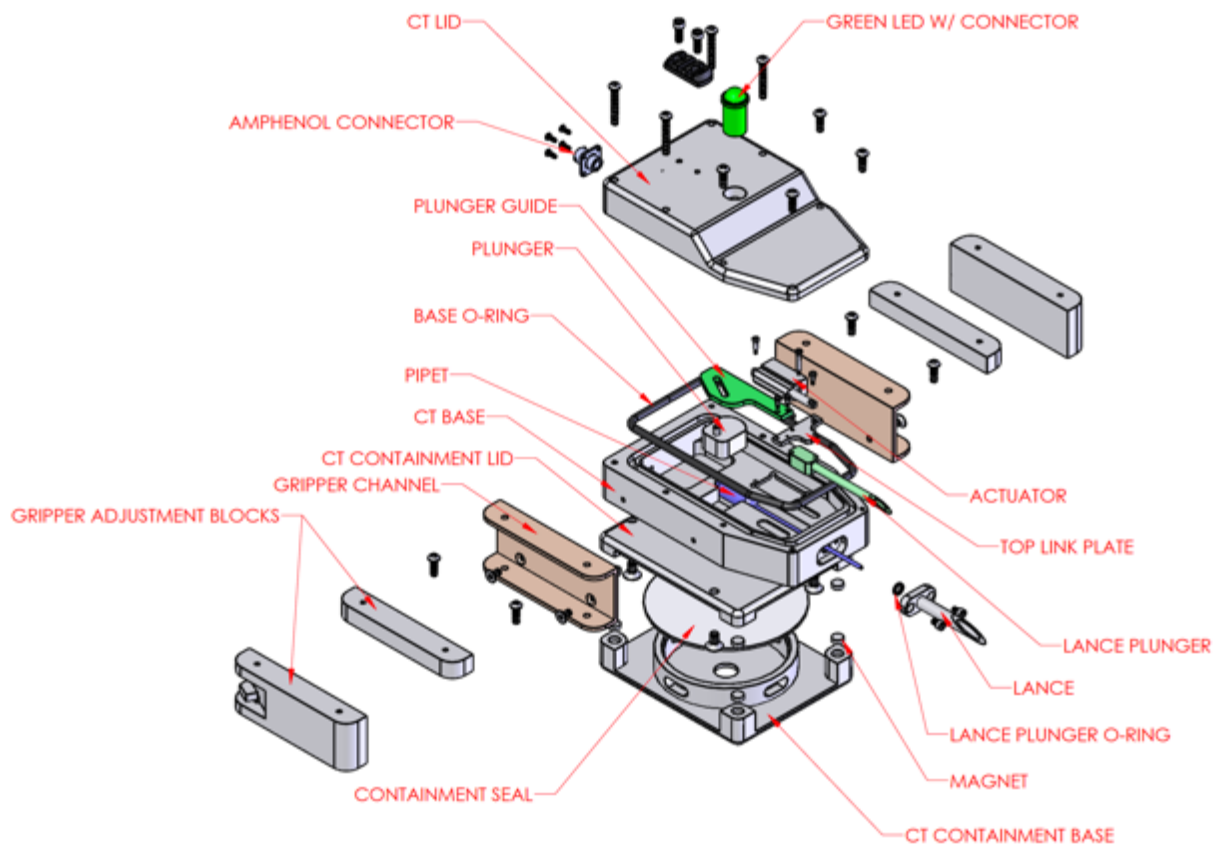
Green LED Actuator Motion Indicator Replacement

1. Access the interior of ChemThief as described above in *General Disassembly of Collector Module*.
2. Remove the pin connector on the wires coming from the actuator motion indicator LED.
3. Remove the actuator motion indicator LED, noting lid seal and washer placement.
4. Install the new actuator motion indicator LED.
5. Reconnect the pin connector.
6. Attach the Amphenol adapter cable.
7. Use the robot or a 9V battery to test the motion of ChemThief[®]. If the actuator binds, check for over tightened screws. Reassembly of this subsystem is complete when ChemThief[®] cycles through a motion smoothly.
8. Remove the 9V battery before storage.

General Reassembly of Collector Module for Storage

1. Disconnect the Amphenol adapter cable between ChemThief[®] and the robot.
2. Install a new containment seal to the containment lid of ChemThief[®] (optional).
3. Do not store a 9V battery in ChemThief[®] to prevent damage from a leaking battery.
4. Align the lid over the base. Start four short screws and four long screws a few turns through the lid into the base. No need to tighten because a new 9V battery will be installed before use.
5. Store all components in the case.

Exploded View Drawing



Customer Support

ChemThief[®] is manufactured and sold by:

Ideal Products, Inc.
126 Capital Court
Nicholasville, KY 40356
Toll Free: 866-931-4363
idealproductsinc.net/ChemThief

ChemThief[®] Kit Part List

ChemThief[®] is shipped with this packing list. Only one set of gripper adapter blocks are provided based on customer specification.

ChemThief [®] Kit Parts List (K5785)		
Item Code 5785-	Description	Qty.
001	CT Base (W Delrin)	1
002	Actuator (w/connector)	1
003	Top plate link SS	1
004	Lance plunger SS	1
005	Lance SS	1
006	Lance O-ring	2
007	Plunger guide SS	1
008	Plunger (W Delrin)	1
009	Pipette	10
010	Base O-ring	1
011	Gripper channels AL	1
012	Gripper adj. blocks	1
013	Talon gripper blocks Delrin	1
014	CT Lid (W Delrin)	1
015	Green LED w/connector	1
016	Battery wire w/3 pin connector	1
017	Micro controller circuit	1
018	Amphenol connector	1
018W	Robot connection cable	1
019	Picatinny rail	1
020	CT containment lid (W Delrin)	1

Item Code 5785-	Description	Qty.
021	Containment seal	5
025	CT Containment base (W Delrin)	1
030	CT foam work support pyramid	1
031	Lance protector (Poly B)	1
031L	Lance mounting screw	2
032	Link shoulder screws	2
033	Lance link screws	2
034	Actuator rear mount screw	1
035	Actuator front mount screw	1
036L	Long lid mount screw (4)	4
036S	Short lid mount screw (4)	4
037	Battery holder and screw	1
038	Containment lid screws	4
039	Gripper channel screws	4
040	Gripper adj. block screws	4
050	.125 driver bit	2
051	1.5mm driver bit	2
052	Screwdriver	1
053	9/64 driver bit	1
054	Petri dish	2
055	Cotton swab	10
060	Black SKB case 31-1813-7	1
061	Foam insert	1
016B	9V battery	2
1042	Pipe cleaners	10
4360	Super Lube 21010	1

ChemThief® Rebuild Kit

The ChemThief® Rebuild Kit provides a set of spare parts for on scene “plug-and-play” repair in the event of mechanical damage or persistent contamination.

The case foam is recessed to provide a storage space for the entire rebuild kit.



Figure 10 - Rebuild kit components displayed on ChemThief® case.

ChemThief [®] Rebuild Kit Parts List (K5785-1)		
Item Code 5785-	Description	Qty.
002	Actuator (w/connector)	1
004	Lance plunger SS	1
005	Lance SS	1
006	Lance O-ring	1
010	Base O-ring	1
015	Green LED w/connector	1
016	Battery wire w/3 pin connector	1
017	Micro controller circuit	1
031L	Lance mounting screw	2
032	Link shoulder screws	2
033	Lance link screws	2
034	Actuator rear mount screw	1
035	Actuator front mount screw	1
036L	Long lid mount screws	4
036S	Short lid mount screws	4
037	Battery holder and screw	1
050	.125 driver bit	1
051	1.5mm driver bit	1
052	Screwdriver	1
053	9/64 driver bit	1

ChemThief® Replenish Kit

The ChemThief® Replenish Kit contains disposable and consumable items to assure ChemThief® can collect several samples on site.

The case foam is recessed to provide a storage space for consumable supplies.

ChemThief® Replenish Kit Parts List (K5785-2)		
Item Code 5785-	Description	Qty.
006	Lance O-ring	5
009	Pipet	30
010	Base O-ring	1
021	Containment seal	5
054	Petri dish	5
055	Cotton swab	50
1042	Pipe cleaner	50
4360	Super Lube 21010	1

Contact

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