Automatic Chlorination and Online Monitoring ACOM Systems
Clean Water and Energy Trust

Chlorine has been a proven disinfectant used worldwide for over a hundred years to purify water. It kills bacteria and other microbial pathogens, safeguarding human health. Globally, the chlorine market for drinking water safety is dynamic and growing, driven by the increasing need for safe and clean water. A WHO report estimates that 400,000 lives can be saved globally from diarrheal disease deaths with improved water safety. In India, government initiatives like the Jal Jeevan Mission (JJM) and AMRUT 2.0, which provide tap water to all rural and urban households, have led to increasing demand for safe drinking water. If the JJM succeeds in delivering microbiologically safe water, it will prevent around 136,000 under-5 deaths yearly in India.

Why ACOM? ACOM—Automatic Chlorination and Online Monitoring is a solution developed by the Clean Water and Energy Trust *. It offers a straightforward solution to the challenge of piped water safety for households at the tail end of the water supply. It is easy for the local community to install, operate, and manage.

Currently, a central water treatment plant adds and monitors chlorine. This treated water supply is at risk of chlorine decay and recontamination during transmission. Consequently, it proves challenging to ascertain the free chlorine level at the point of supply to the community.

> "…. water treatment technologies like filtration and UV treatment can make water safe, but they don't keep water safe during transport and storage. If water comes in contact with contaminants again, in systems that don't have a constant pressurized water supply, negative pressure in pipes may pull in contaminated water from outside, causing recontamination. The presence of residual chlorine in water keeps it safe for bacterial recontamination for prolonged periods during water supply. For this reason, the World Health Organization recommends that water treatment be dosed approximately to maintain a residual concentration of Chlorine in the water to provide some protection from post-treatment contamination during storage."
> *Prof. Micheal Kremer, 2019 Nobel Prize Winner in Economics, at the Jal Jeevan Mission National symposium on safe water 2024.*

What is ACOM? Automatic Chlorination and Online Monitoring System, as the name suggests, ACOM automatically chlorinates water at the point of supply, such as overhead tanks or in-line piping, using NSF-certified material of construction and chlorine tablets. It operates without grid power, utilizing the kinetic energy of water, making it suitable for remote locations. It offers the advantages of reduced chemical use with minimal human intervention in chlorination, improved water quality, increased efficiency, and better sustainability. ACOM can significantly reduce health risks and improve economic outcomes, making it an ideal solution for state governments, housing societies, municipal corporations, and remote communities.

Automatic Chlorination Treatment Processes: The Automatic chlorination device uses NSF-certified food-grade chlorine tablets, requires no electricity, has no moving parts, has long-lasting consumables (chlorine tablets), is easier to maintain, and has an easily controlled dosing. It has an easy installation and provides operational convenience as it requires weekly or fortnightly refilling, depending on the water consumed. The local community can operate and maintain it. The other benefits it offers are

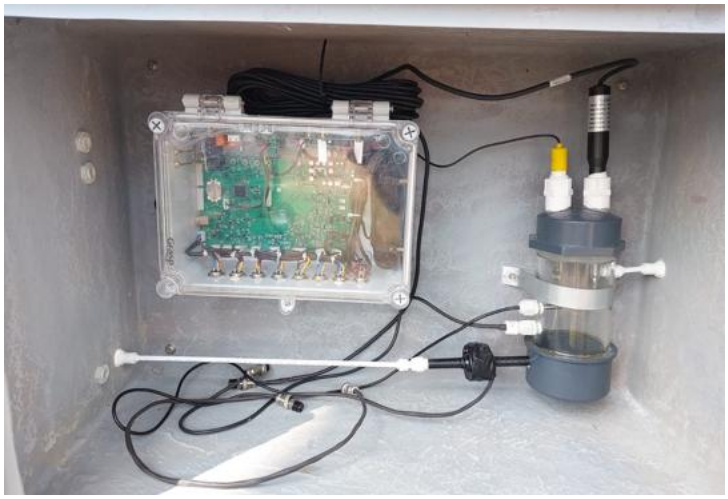
- **Optimization**: Reduces human intervention from daily to once a week, optimizing dosing and leading to reduced chemical use, more efficient resource utilization, and improved system efficiency.
- **Reduced risk of contamination**: Last-mile water safety and consistent chlorine levels help prevent recontamination and ensure water remains safe for consumption for the tail-end household.
- **Long life:** No moving part
- **Lower environmental impact:** Reduced chemical use translates to a lower environmental footprint for water treatment.
- **Efficient: T**he solar-powered system continuously monitors chlorine levels and other water quality parameters, allowing for necessary adjustments and corrective actions. Consistent monitoring and accurate measurements ensure safe and effective disinfection and prevent issues from escalating.
- **Cost Savings:** Improved efficiency, reduced waste, and minimized labour costs lead to significant financial savings.
- **Chlorine monitoring:** Implemented by a hand-held kit for regular monitoring.

ACOM Products: We offer the following models based on the size of the water supply infrastructure:

	MODELS	FEATURES
1	**ACOM-50**	ACOM 50-26-3 40KL- 90KL/Day; 3 Kg Chlorine Tablets capacity
2	**ACOM- 100**	ACOM 100-42-6 90-200KL/Day; 6 Kg Chlorine Tablets capacity
3	**ACOM-200**	ACOM 200-48-15 200-350KL/Day; 15 Kg Chlorine Tablets capacity

CHLORINATOR ACOM-50

CHLORINATOR ACOM 200

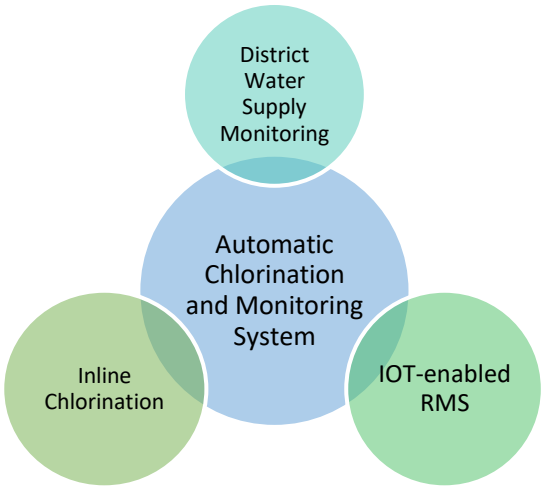


Flow cell with Instruments and ACOM Monitor

Automatic Chlorination & Online Monitoring System for Tanks (ACOM)

The ACOM system is an IoT-enabled solution for automatic inline chlorination and monitoring of water supply from overhead tanks (OHTs) in rural and urban settings.

It treats piped water supply at the point-of-supply to inactivate disease-causing microbes (bacteria, virus and protozoans) and reduce the burden of waterborne diseases like diarrhea, typhoid, jaundice etc.



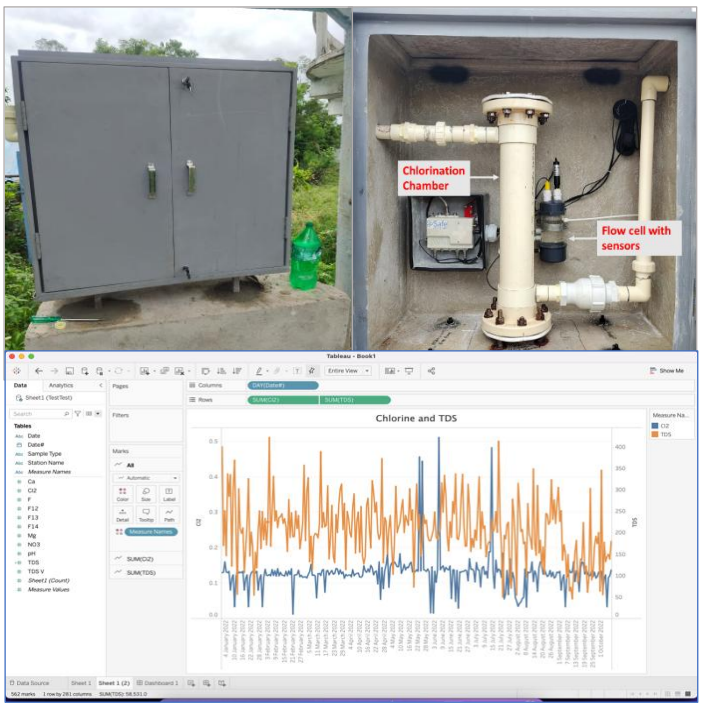
Capabilities

- Inline chlorination of piped water, ensuring water safety at the point-of-delivery
- Sensor-based quality/performance tracking
- Residual chlorine, TDS, pH, Turbidity
- Flow volumes, Timings
- IoT-enabled data transmission to central server and automatic dashboarding
- Option of solar power for off-grid locations
- Lockable housing to protect from weathering, vandalism
- Onsite data reporting and visualisation through smartphone application

  Can be deployed in supply pipeline at point-of-entry, and overhead/ underground tanks

IT Features

- App and database server hosted on world-class cloud infrastructure ensuring seamless user experience
- Android-based mobile phone app for technicians and watermen, Gram Panchayat-appointed OHT operators, to communicate with the ACOM device via Bluetooth
- ACOM web interface and mobile interface available for access to real-time dashboards containing graphical data visualization and granular reporting
- Data analytics using Tableau for donor and stakeholder reporting



ACOM SYSTEM AT A GLANCE

System Element	Specifications	ACOM CHLORINATOR Model		
		ACOM 100-26-3	**ACOM 100-42-6**	**ACOM 150-48-15**
	Treatment Capacity (Water Storage Tank KL/ day)	40-90	90-200	200-350
	Overhead/underground storage			
ACOM Chlorinator	**Electricity Requirement**			
	Electricity Power	No, power needed. System operates on kinetic energy of water.		
	Material and Components			
	Chlorinator	All components in contact with water are manufactured with NSF certified material		
	Chlorinator Housing	Fibreglass housing for the chlorinator and associated IoT electronics and Instruments		
ACOM Monitor	**Water quality monitoring**			
	ACOM Electronics with Flowcell and sensors mounted in a dedicated housing	Electronic controller with Sensors to track: Residual chlorine, TDS, pH, Turbidity, temperature, water supplied		
Operation & Maintenance	**Operation & Maintenance**			
	Capacity to hold chlorine tablets Kg	2.7	5.7	14.5
	Refilling requirement	As per usage, generally will need on refill in 2-3 weeks		
	Adjustment of control valves etc	Once every 4 weeks		
	Calibration of sensors etc	Once every 8-12 weeks		

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