

DOD ChemLogic 8 Toxic Gas Monitor Overview

Location: South Hallway across from room EP 240.

Emergency Contact:

- 1.. Dr. Steve Smith, Office: EP 220
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Online Alarm Status

The CL8 toxic gas monitor (TGM) samples the air at six points within EP 240. When actively monitoring, the TGM will be in one of three states:

State	Indicators
Normal	Status Lamp: Solid Green
Alarm Level 1 (AL1)	Status Lamp: Solid Red Monitor alarm sounds
Alarm Level 2 (AL2)	Status Lamp: Flashing Red Monitor alarm sounds Building evacuation alarm activated

The system continuously samples by pumping air through polyvinyl tubing onto chemically sensitive tape, which changes color upon exposure to hydride gases, and is analyzed optically. The alarm status is determined by the measured toxic gas concentration at these points, according to the following range thresholds:

Point	Normal Range	AL1 Range	AL2 Range
1: Gas Cabinet	<5ppb	5 ppb-50 ppb	>50 ppb
2: Reactor Cabinet	<5ppb	5 ppb-50 ppb	>50 ppb
3: Scrubber Outlet	<5ppb	5 ppb-50 ppb	>50 ppb
4: System Enclosure	<5ppb	5 ppb-50 ppb	>50 ppb
5: Room	<5ppb	5 ppb-10 ppb	>10 ppb
6: Pump Cabinet	<5ppb	5 ppb-50 ppb	>50 ppb
7: <i>not active</i>	-	-	-
8: <i>not active</i>	-	-	-

Offline Alarm Status

The TGM may also be partially or entirely inactive (offline) in cases of faults or for service. In these cases, no monitoring of toxic gas levels is being performed. Persons should not enter EP 240 without additional information regarding activities within the room.

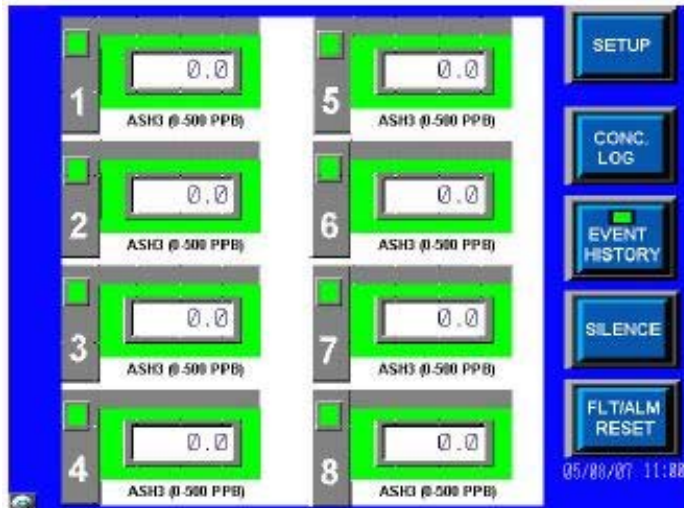
State	Indicators
Normal/Service required	Status Lamp: Flashing Green/Orange
Offline/Service required	Status Lamp: Flashing Blue/Orange
Offline	Status Lamp: Blue
Monitor power off	Status Lamp: <i>off</i>

The power switch for the TGM is located on the wall inside EP 240 and labeled "Gas Monitor". The offline status is read as "trouble" by Campus Security. Two common reasons for monitor faults follow:

- Monitor flow settings need to be adjusted.
- Monitor tape needs to be replenished (DOD Part# 1-300-012).

Monitor Control

The gas levels at all six points are indicated on the front display of the monitor. The text background is **green** in the **normal** state. The text background is **red** for those points that show readings in the ranges for **AL1** or **AL2** states. A flow fault at any point is indicated with a **yellow** background for that point. The target flow can be reached by pressing the soft key for a particular cell to view its flow range and adjusting the corresponding flow valve on the front panel.



The alarms are presently configured to be unlatched, meaning that the alarm status will return to normal after the alarm condition has cleared. If the alarms are configured as latched, pressing the soft key **FLT/ALM RESET** is needed to restore normal status after the alarm has cleared.

Some service/maintenance issues require entering the password:
Password: **1225** (Also printed on the inside of the maintenance door.)

Online access to read the TGM status is under development.
An electronic history of TGM readings is recorded on a removable compact flash card.

Responses

If the MOCVD system is running, the interlocks will enter Abort status, causing all pneumatic valves to close to contain the gas leakage. If the system is not running, these valves will already be closed. The system cannot be reactivated until the TGM alarm has been reset.

The following actions take precedence in all situations:

- All persons should exit EP 240 immediately.
- Notify Emergency Contact personnel.
- Check the TGM display to determine the point(s) where toxic gas levels were detected.

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Particular responses are determined by the following circumstances:

1) Point-5 status (**Normal**, **AL1**, **AL2**)

Note: Detection of a high level of toxic gas in the room is considered highly unlikely.

2) Gas cylinder status (*Open, Closed*)

Note: All gas cylinders are to be closed when the system is unattended.

	Gas Cylinders: <i>Closed</i>	Gas Cylinders: <i>Open</i>
Point-5 Normal	<u>0a:</u> -No hazard is present outside EP 240. -Trained personnel may enter EP 240 for remedial action.	<u>0b:</u> -No hazard is present outside EP 240. -Trained personnel may enter EP 240 for remedial action. Use of SCBA is recommended. (Go to 0a)
Point-5 AL1	<u>1a:</u> -Untrained persons should stay clear of EP 240 until further notice. -Trained personnel may enter EP 240 for remedial action using SCBA.	<u>1b:</u> -Untrained persons should stay clear of EP 240 until further notice. -Limited access permitted by trained personnel for remedial action using SCBA. (Go to 1a)
Point-5 AL2	<u>2a:</u> -EP building should be evacuated. -Verify TGM status online. -Do not enter building until Point-5 status AL1 is reached. (Go to 1a)	<u>2b:</u> -EP building should be evacuated. -Verify TGM status online. -Do not reenter building. -Emergency HAZMAT response required.

The following remedial actions may need to be taken by trained personnel:

- Close the arsine cylinder valve (inside gas cabinet, left).
- Close the phosphine cylinder valve (inside gas cabinet, right).
- Close the hydrogen cylinder valves (inside system enclosure, left and right).

Other Information

CL8 Monitor Serial #: 10038

The tape maintenance area is to be cleaned ever six months. Cleaning instructions are included in the MOCVD system manual.

The TGM status can be checked online at: <http://ahrenkiel.sdsmt.edu/MOCVD/tgm>