# Technical Note
# Methane Cloud Simulation Target

*Nov 2024*

A Methane gas cloud simulation target abbreviated "ST", (P/N A1604800300) is available from CI Systems.

Use the ST to demonstrate and test MetCam. It simulates a high path-concentration (>200% LEL.M) Methane cloud. This short application note describes the proper use of this simulator.

The purpose of the ST is to trigger a safety/emissions alarm on MetCam.
MetCam safety alarm levels are set to values that represent a dangerous Methane cloud. The definition of "dangerous" includes three main parameters – cloud density, cloud size and cloud persistence. MetCam emission alarms are triggered when a user-set threshold is exceeded.

Notice that observing threat detection on the live video stream (Yellow/Red overlaid pixels) does not mean that an "Event" will be generated or that a 4-20 alarm signal will be issued. To generate an "Event" and trigger the 16/20 mA signal the Simulation Target should be used at the correct distance and for a long enough period of time.

## Handling

The ST is made of a thin, semitransparent, plastic film glued to a wire frame and equipped with a handle.
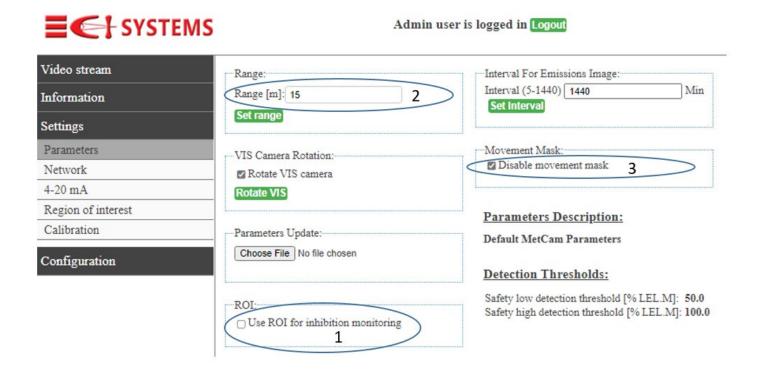
The film is tear-able; it is easily punctured and torn. Small tears and punctures tend to extend in the material. Take care to avoid making contact with sharp objects, keep it in its cardboard package when not in use.

In the event that the ST film is punctured or cut, place an adhesive tape on both its sides to delay the break from developing further. The ST is still functional with small tears and adhesive tape.

## *MetCam Setup*

To demonstrate the cloud detection and alarming with the ST, MetCam needs to:

- Complete its warmup period (30 min).
- Un-check the ROI checkbox in the Parameters tab (see #1 in the following picture)
- To relax the threshold safety parameters so that an "Event" will be generated, set the range parameter in the WebUI (see section 3.7 in the "MetCam commissioning and WebUI manual") to 50 meters. This will "fool" MetCam into calculating a larger cloud area than that physically subtended by the ST (see #2 in the following picture).
- Deactivate the "Enable Movement Mask" in the Settings/Parameters tab (see #3 in the following picture). If the movement mask is active, it will mask out the simulation target and there will be no detection.
- In the 4-20 tab, reduce the set delay time to 1 second.

## Use

The ST use is simple to use but requires attention to some details:

**Distance from MetCam:** Since the ST is small in size and needs to represent a 1-meter diameter cloud, it should be used at a distance of up to 10 meters from the MetCam. Using it for longer distances will simulate a cloud that is too small to generate an alarm.

**Background selection**: The background (the object behind the ST) plays an important part. The ST should be used in a location where the background object is at a temperature that is different from that of the ambient air; usually this means that you would want to have an object behind the ST that is warmer than the ambient air. The difference should be of at least 3 degrees C.

The picture on the left is an example of a good setting – the picture is taken from the point of view of the MetCam. There is a metallic man-made item in the background that is hotter than the ambient air and the ST is fully seen by MetCam.

The picture on the left is an example of how not to use the ST, it has vegetation in the background. Vegetation temperature is usually very close to ambient air temperature.

The picture on the left shows having the body as the background, this can sometimes work well.

**Angle and distance:** The ST should be used to a distance less than 10 meters since it is a relatively small object. The ST should be oriented perpendicular to the MetCam line of sight.



The picture on the left shows how <u>not</u> to hold the ST – it is not perpendicular to the line of sight of MetCam. This effectively decreases the size of the ST observed by MetCam and therefore reduces the threat level of the cloud it simulates.

**Waving the ST:** MetCam uses multiple algorithms to declare the presence of a dangerous gas cloud. One of these is observing the motion of the gas cloud. For the ST to trigger an alarm, it needs to be in constant motion for at least 10 seconds.



Swing the ST up and down as described in the photo on the left. The stroke of the swing should be large, and each swing should take 1-2 seconds. Don't swing it too hard – it will break the ST.

Swing constantly for at least 10 seconds then stop swinging the ST. The recorded event, stored in MetCam memory, will show the start of the event and will last a few seconds after the swing has terminated or 20 seconds, whichever comes first. The recorded event includes a few seconds of pre-event recording.

If wind is present, try to stand with your back to it so that the ST is in the downwind direction. Otherwise it might tend to be blown around by the wind.