



OMEDS

**Optical Methane Emissions
Detection System**

Fugitive Methane Emissions



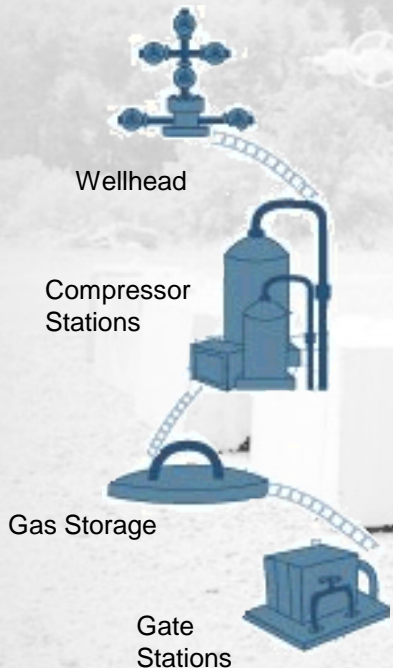
EPA has released unprecedented federal regulations on the oil & gas industry to reduce methane emissions through the entire supply chain. Regulations require bi-annual inspection of every new component throughout the supply chain.

Annually the US Oil & Gas Industry releases more than 7.3 million metric tons of fugitive methane emissions at a loss of nearly \$2 billion.



Remote Assets on Supply Chain

- 500,000 gas wells in production
- 305,000 miles of pipelines
- 1,400 compressor stations
- 11,000 delivery points
- 400 gas storage facilities



Current Detection Methods – Industry Standard



Methane Gas “Sniffers”



Thermal Detection

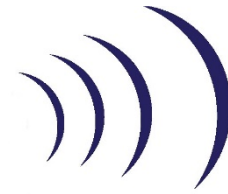
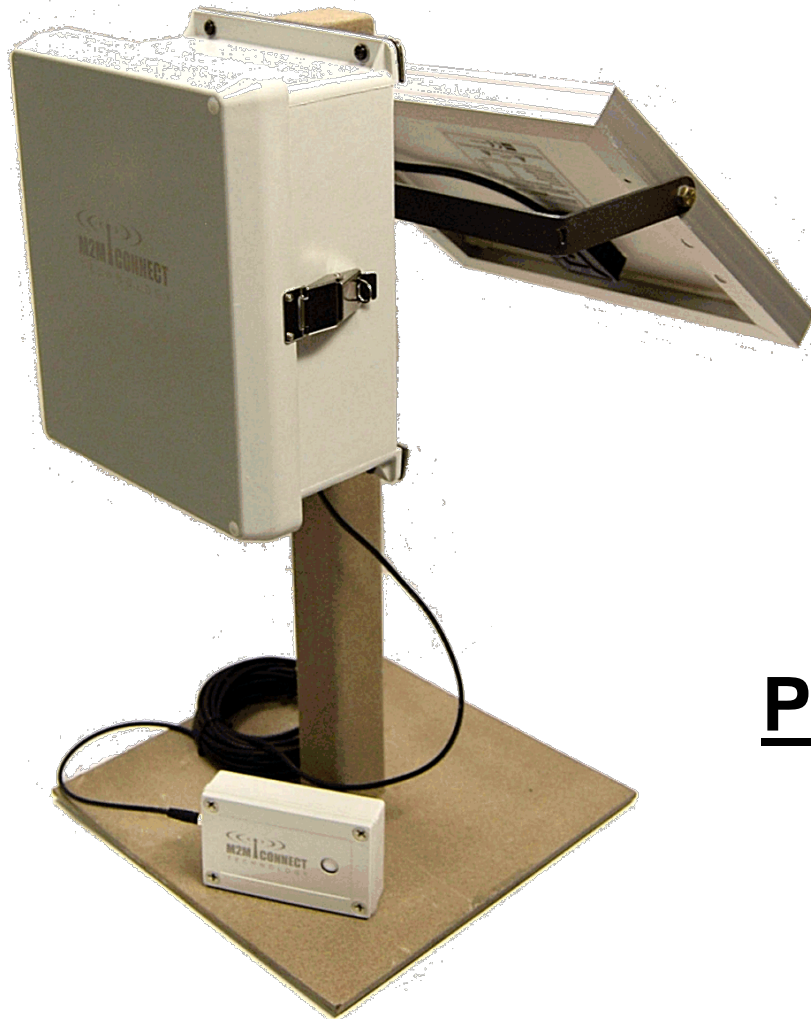


Manual Recording

Bi-Annual Manual Inspection
Industry average cost \$12K to \$18K per site annually

Real-Time Continuous Methane Monitoring

RemoteMonitor CH4

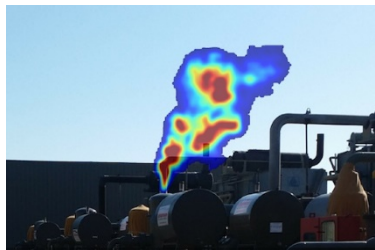
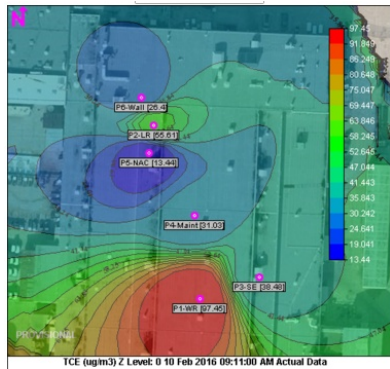
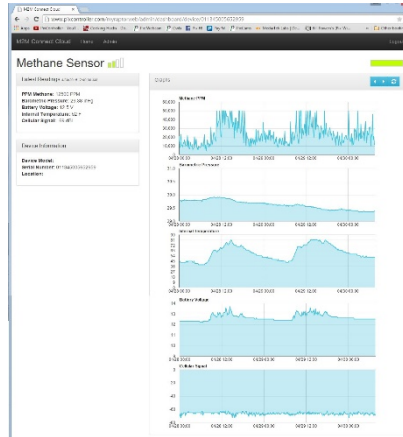


Problem: The system cannot identify the source of the emissions



OMEDS System Overview

Optical Methane Emissions Detection System



OMEDS Base Station

- Real-Time wireless data transmission
- Custom hardware solution
- Weather station integration
- OMEDS Optics (Color & Thermal Cameras)
- Battery/Solar powered



Dispersion Wireless Methane Sensor

- 5 PPM methane detection resolution
- Detects up to 20% LEL
- Wireless transmission range 1Km
- Battery/Solar powered

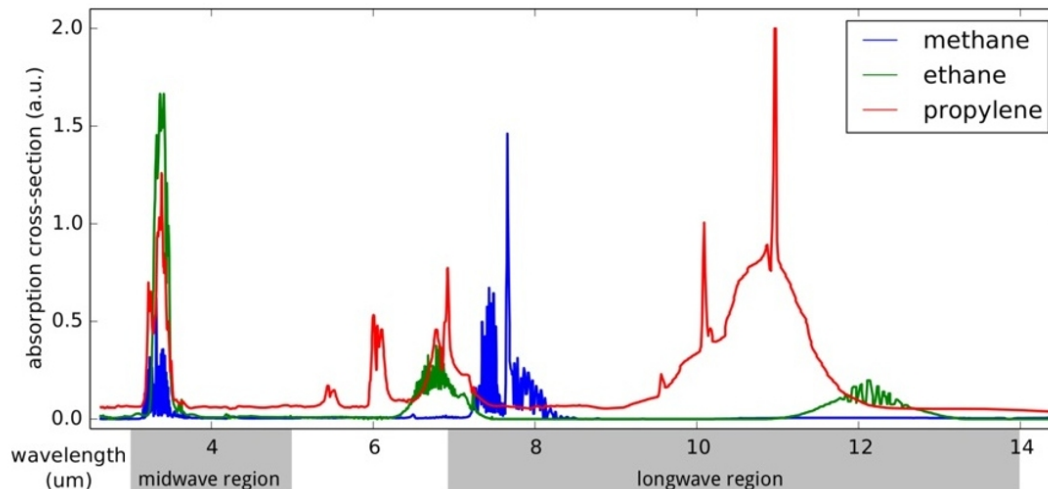
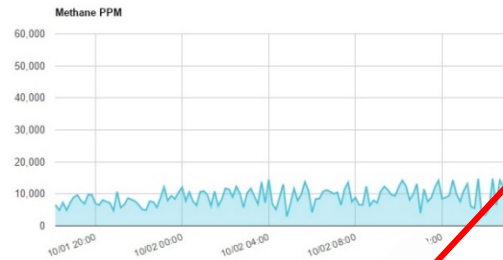


OMEDS Optics

Dual High Res Color & Thermal Cameras



Example thermal methane emissions



Thermal IR Illuminator

- 7-9um range
- Low power
- 2M range/Illuminator
- Cost \$20 each



FLIR LWIR Thermal Sensor

- Uncooled microbolometer
- 7.5-12um spectral range
- Video output
- Low power
- Cost: \$1,000



Color Camera

- 2MP – 5MP
- Low power
- Cost: \$50

OMEDS Optics

- Pan-Tilt Stage
- Waterproof enclosure

Total Cost ~\$2K. Cost saving of 98% over MWIR sensors.

Industry Pain-Points Solved

Cost Savings

- More effective and less expensive method to comply with pending federal regulations and current state regulations
- Reduce labor charges by 40-70% over current methods
- ROI 6-12 month



Real-Time Notification

- Real-time visual notification of emission source
- Data archiving of continuous data stored on cloud
- Notification of battery & signal issues for preventative maintenance



Fast Response

- Real-time notifications lead to fast response time to repair leaks



Limit Liability

- Limit public health concerns, liability issues, and product loss



Automated Reporting

- Automatic report generation with customized options for regulated compliance

Device ID	Alarm Level	Sensor Type	Timestamp	Sensor Value
01	2	004	2020-10-01 10:00:00	100.00
02	2	004	2020-10-01 10:00:00	100.00
03	2	004	2020-10-01 10:00:00	100.00
04	1	004	2020-10-01 10:00:00	100.00
05	1	004	2020-10-01 10:00:00	100.00
06	1	004	2020-10-01 10:00:00	100.00
07	2	004	2020-10-01 10:00:00	100.00
08	2	004	2020-10-01 10:00:00	100.00
09	2	004	2020-10-01 10:00:00	100.00
10	2	004	2020-10-01 10:00:00	100.00
11	2	004	2020-10-01 10:00:00	100.00
12	2	004	2020-10-01 10:00:00	100.00
13	2	004	2020-10-01 10:00:00	100.00
14	2	004	2020-10-01 10:00:00	100.00
15	2	004	2020-10-01 10:00:00	100.00
16	2	004	2020-10-01 10:00:00	100.00
17	2	004	2020-10-01 10:00:00	100.00
18	2	004	2020-10-01 10:00:00	100.00
19	2	004	2020-10-01 10:00:00	100.00
20	2	004	2020-10-01 10:00:00	100.00

Market Segments

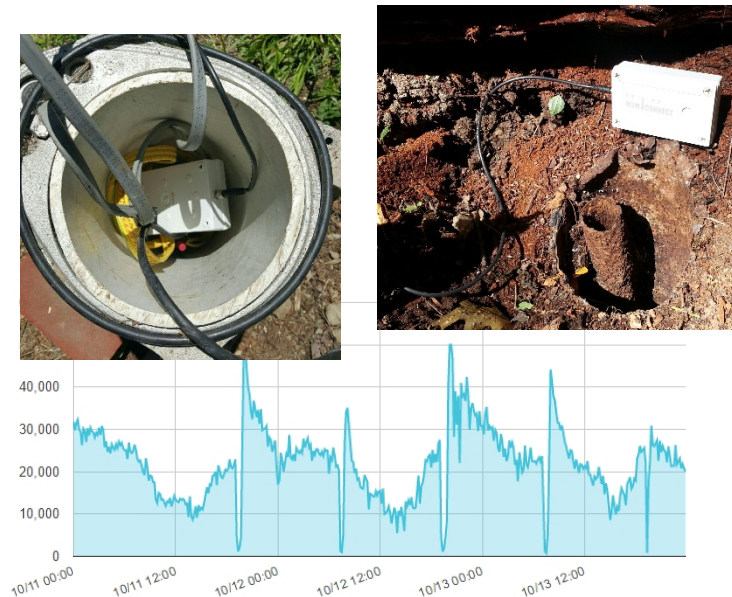
Fugitive Methane Emissions

Primary focus to provide continuous methane monitoring for Oil & Gas companies with assets in the upstream and midstream supply chain to comply with EPA regulations.



Stray Gas & Abandoned/Orphan Wells

Provide continuous methane monitoring products for the stray methane gas emissions caused by wellbore integrity issue & monitor abandoned/orphan gas wells within a given radius of unconventional gas well.



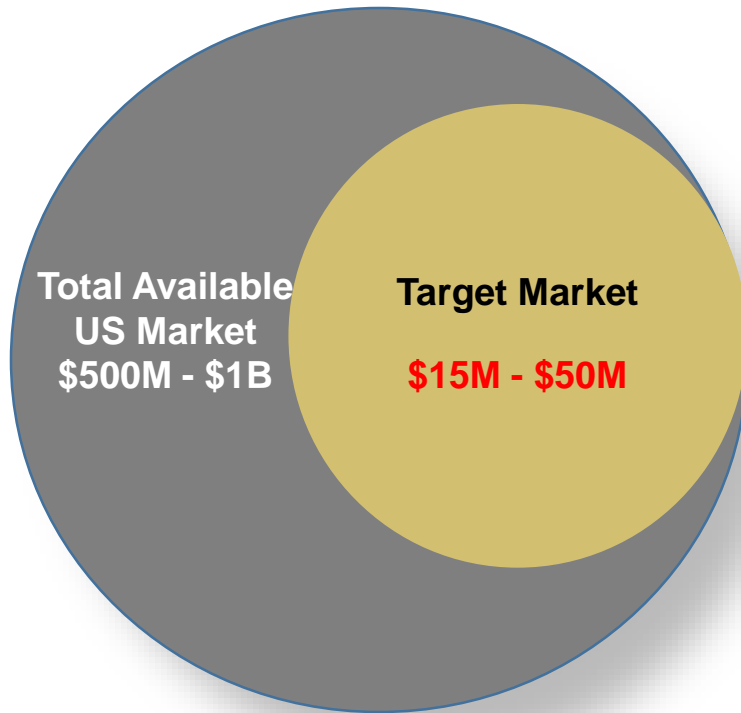
Landfill Emissions

Municipal solid waste landfills are currently regulated under the EPA's "Clean Air Act Guidelines and Standards for Waste Management". Current monitoring procedures are labor intensive.



Market Segment Size

Fugitive Methane Emissions



- EPA estimates ~\$560M in monitoring cost with over \$600M saving of product loss
- Industry projects \$600M to \$1B in annual monitoring costs

Stray Gas Migration



- Current successful pilots with major energy operators
- PA DEP requires all structures within 2,500' from well pad be monitored including abandoned & orphan natural gas wells.

Landfill Monitoring



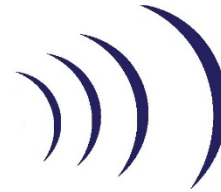
- Current successful paid pilots landfill business partner

Profit Margins

Systems Sale & Lease Options



Data Telemetry Revenue



Cloud Data Revenue



Pricing/Margins

Direct Sales Model:

\$850 COGS	\$65 OpEx	\$2,085 Profit	70%
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Customer Cost

\$3,000

Sales Rep Model @ 10%:

\$850 COGS	\$65 OpEx	\$300 Reseller	\$1,785 Profit	60%
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Customer Cost

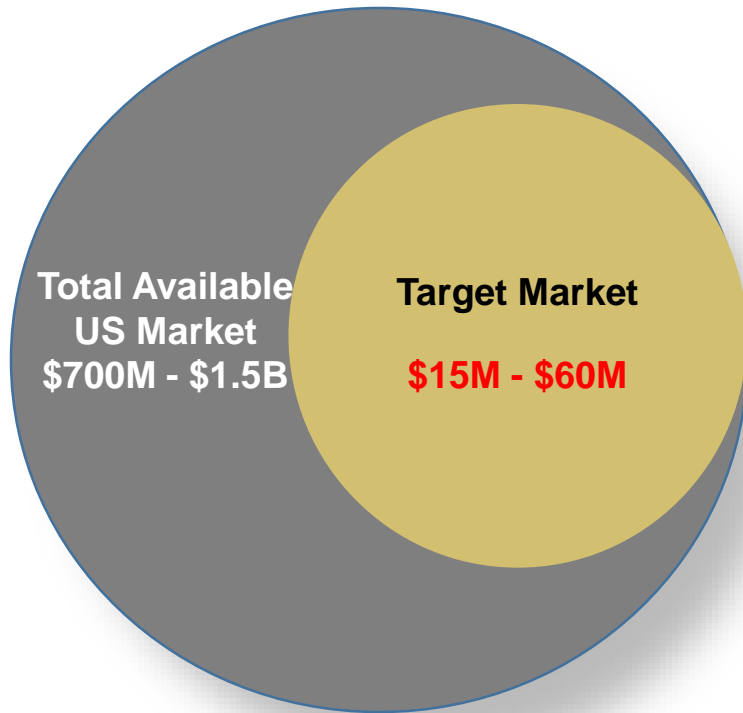
\$19.95/mo

Recurring Data Revenue:

\$2.75 COGS	\$17.20 Profit	86%
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Market Projections

Total Methane Monitoring Markets



Yearly Sensor Sales (3-5 years)

5,000 sensors X \$3,000/sensor = **\$15M**
(416 sensors/mo)

Recurring Data Telemetry Revenue

5,000 sensor X (\$19.95/mo - \$2.75 carrier charge) = \$86K/mo
\$86K/mo x 12 mo = **\$1M/yr**

Recurring Cloud Data Service Reveune

???
(Data Analytics)

Distributor Channels



ProSight Specialty Insurance offers insurance to the oil & gas industry. They are providing insurance policies for the fugitive methane emissions regulations for companies using continuous monitoring and has selected PixController, Inc. as an exclusive industry partner.



Currently installing tank level and flow sensors in oil & gas industry. Interested in adding the PixController methane monitoring solution to their current product line for meeting EPA fugitive methane regulations market.

Environmental Protection Agency



The Environmental Protection Agency (EPA) is issuing this request for information to the public to obtain information about monitoring, detection of fugitive emissions, and alternative mitigation approaches in the oil and natural gas sector.

Technology & Scientific Partner Channels



Natural Gas: Stray methane gas experts

- Helped establish stray gas regulations and protocols
- Master Service Agreements (MSA) with most Appalachian Basin Energy Companies
- Teaches seminars on stray gas to industry
- Respected in scientific community & publishes papers



Landfill: Stray methane gas experts

- Developed dispersion algorithms
- Specializing in automated monitoring and web based visualization of sensor network
- ASTM International Committee - "Continuous Soil Gas Measurements: Worst Case Risk Parameters"

Telemetry Data Sales Partner Channels



PixController, Inc. has been part of the Verizon Partner Program (VPP) for the past 4 years. The relationship is an integral part of the overall value a solution provider seeks in vendor. Access to a sales force of 120K people for market position in many different vertical markets by generating leads in our sales portal.



Looking for IoT partners in the oil & gas industry. Winner in the 2015 AT&T Fast Pitch IoT Evolutions Contest which connected our methane monitor product solutions with their Innovation Laboratory in San Francisco.

Business & Revenue Model

Product Sales

- Direct product sales
- Lease packages including installation, and data & cloud services
- Oil & Gas product distributors & service companies
- Environmental monitoring company sales
- Cloud software license

Recurring Revenue Streams

- Reselling wireless data bandwidth (Cellular/Satellite)
- Cloud data storage & dashboard services
- Data analytics
- System service & maintenance packages

Manufacturing and Scaling

- CSE Corporation manufacturing (sensor partner)
- Explore Contract Manufacturing if needing to scale
- ORBCOMM, Inc. – data plan management for all carriers
- Expedient – scaling cloud servers



- ## Production Scale Up

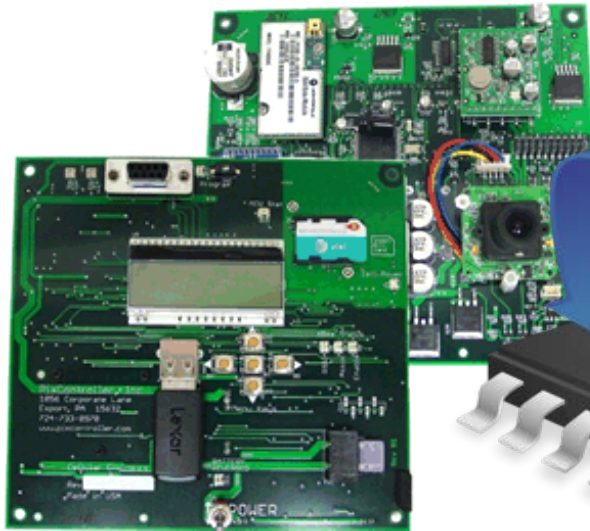
- Limit risk potential where sales are constrained by capacity to manufacture products.
- Manage cash flow and finances to inventory long-lead production items.
- R&D need time to refine the product design to meet market needs and changes.



IP Status

PixController, Inc. has filed several provisional patents including the OMEDS System. Traditionally PixController has protected our IP through Trade Secrets in the form of:

Hardware Development

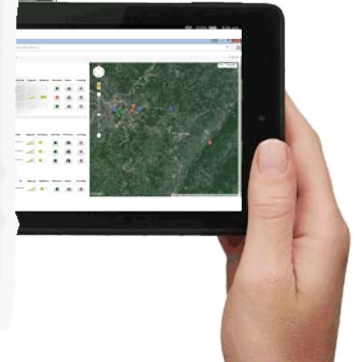
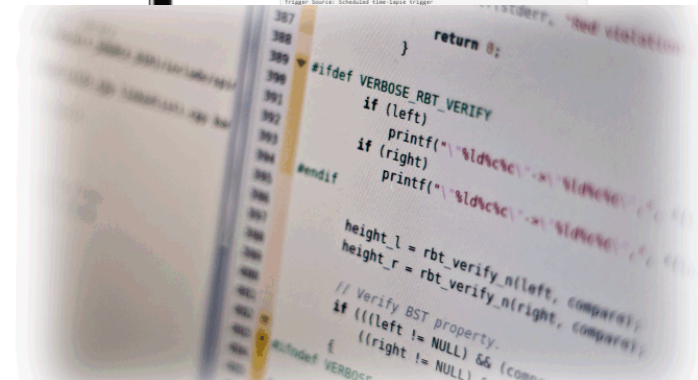
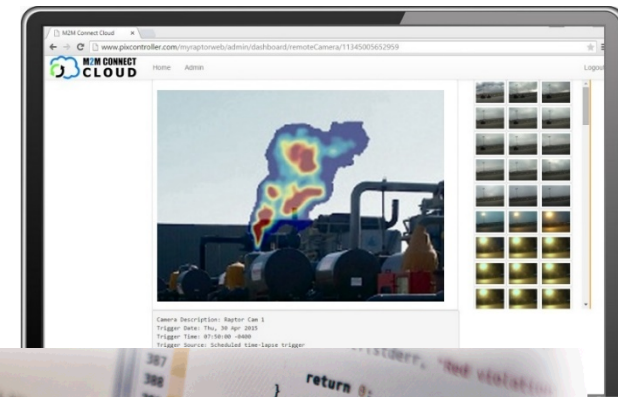


Firmware Development



Wireless Protocols

Cloud Software



Product Applications of OMEDS Optics

On-Demand Streaming Video







Integrated into Handheld Gas Detectors



Attach to Drones for Pipeline Surveys



Competitive Landscape

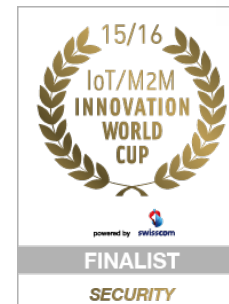
Product	Target Market	System Specs	Battery	Price
RemoteMonitor CH4 	Oil & Gas Fugitive Emissions, Stray Gas Monitoring, Landfills, Sewer Gas	<ul style="list-style-type: none"> • Detects to 100% volume • Ultra-low power • Wired sensor w/ atmospheric • Cellular & WiFi telemetry 	2+ years	\$3,000
GDS GASMAX TX 	Oil & Gas: Industrial emissions	<ul style="list-style-type: none"> • Detects to LEL (5% volume) • Mesh network CH4 sensors • Cellular gateway 	6 months	\$12,000+
TekSolv TEKNET 	Oil & Gas: Drilling rig monitoring, environmental	<ul style="list-style-type: none"> • Detects to LEL (5% volume) • Mesh network CH4 sensors • Only sends alarms at LEL • Satellite gateway in trailer 	45 days	\$10,000/mo. lease
Loci Controls 	Landfill: Methane gas recovery	<ul style="list-style-type: none"> • Detects to 70% volume • Mesh network CH4 sensors • CDMA Cellular only 	2-3 weeks	(not on market) NSF SBIR Phase II

Company Information

PixController, Inc. specializing Internet of Things (IoT) solutions for outdoor, self-contained battery operated, wireless surveillance cameras and environmental monitoring systems. Founded in 1999 incorporated in 2004.



Currently PixController, Inc. sub-leases 3,000 sq/ft from CSE Corporation 70,000 sq/ft manufacturing & R&D Facility in Murrysville, PA.



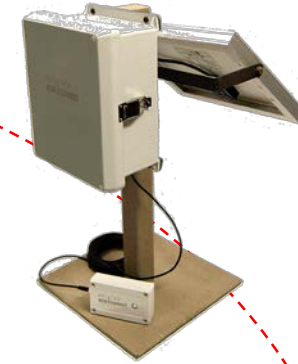
PixController Product Family



Security
Cameras



Air Quality



Streaming
Cameras



Weather
Monitoring



Covert
Security



Water Quality

