

***ESG sustainability***

***with***



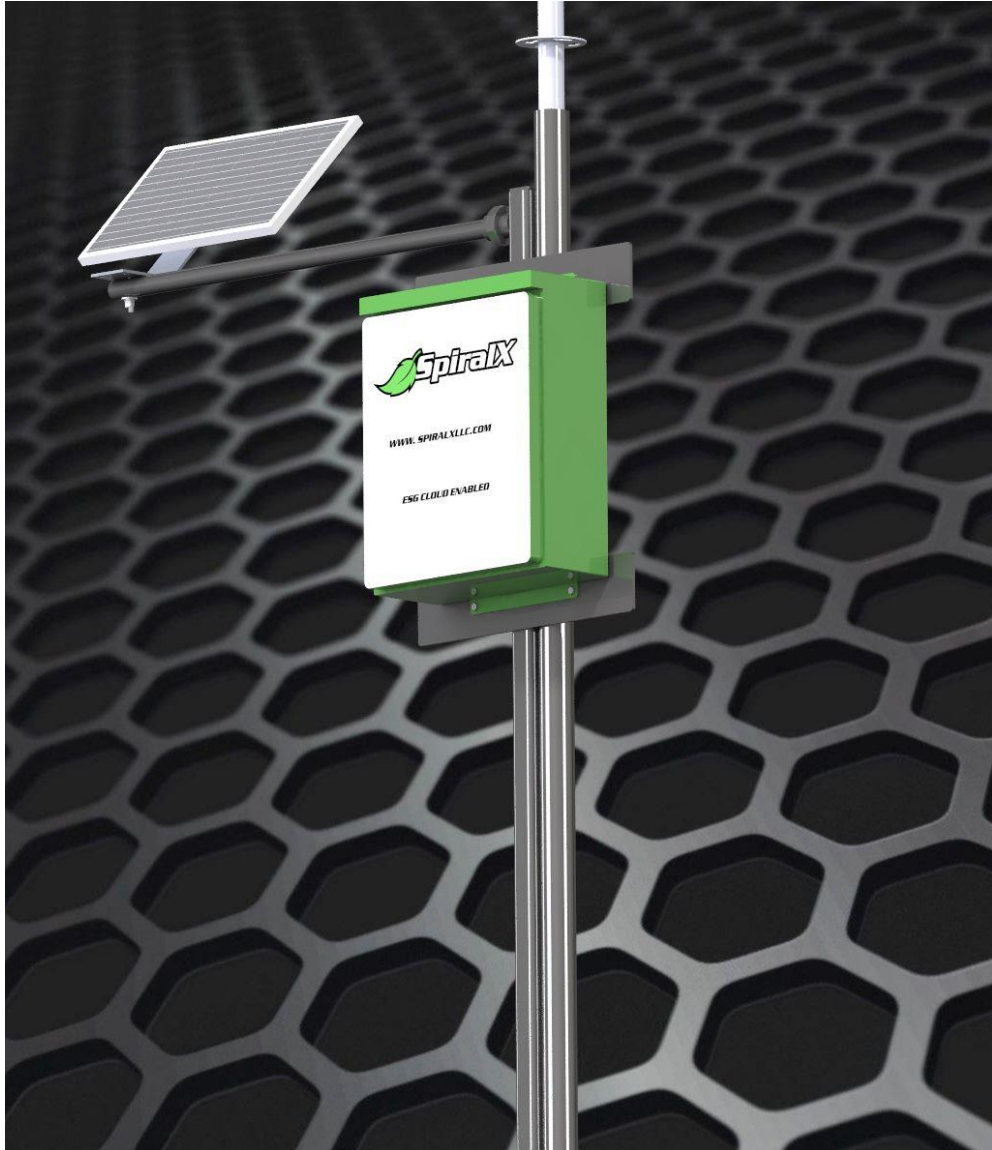
***Governance***

***Manual***

## Spiral X LLC

Department of Engineering

Governance Technical Manual



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## GOVERNANCE TECHNICAL MANUAL

Thank you for your consideration of the ESG.cloud experience. This manual covers the governance adherents of the Spiral X ESG platform. Midstream companies have more field to cover, less resources available and the overhead it takes to manage it all. The time has come to have an all-encompassed system to aid organizations' to be more efficient in their process management infrastructure.

**Emissions are the byproduct of inefficiency.** Being able to make sound decisions based on how each individual BTEX System is operating is pivotal to the decisions being made in the field. The end user needs hard data to be able to make these decisions. The EPA has established a value of \$4,600 per ton removed, which comes to over \$400,000,000 in financial savings to U.S. climate damage, human health, labor productivity, and crop yields, to date. The following document highlights the Spiral X ESG platforms components and their role in your company's future as it relates to the governance piece of ESG.

### 1. GOVERNANCE

The Spiral X ESG Platform is the leader in environmental, social, and governance initiatives. In addition to providing environmentally and safety conscious emissions systems, we are dedicated to ensuring our products and business practices adhere to the social and ethical standards that appeal to today's investors. The ESG Platform not only eliminates harmful emissions, but it also provides constant real time monitoring to meet the governance requirements, as set forth by the EPA. This is done through the ESG.CLOUD network.

#### 1.1 COMPLIANCE

ESG.cloud network provides governance that is 100% compliant with the EPA and state air quality laws. real time monitoring is at the epitome of what Governance compliance means. The Spiral X ESG platform meets the following strict New Mexico laws for emissions management:

- Applicability (1) All new and existing glycol dehydrators with a potential to emit equal to or greater than 2 tons of VOC.
- An owner or operator may submit for the department's review and approval an equally effective, enforceable, and equivalent alternative monitoring strategy.
- Each monitoring event must include, date and time of testing, name of personnel conducting, ID of unit, maintenance record, results of testing, turned in within 3 days.
- Electronic record must be kept for a minimum of 5 years.
- Data must be available within 24 hours of request.

#### 1.2 SPIRAL X APPLICATION OF GOVERNANCE

To date more than 82,000 tons of greenhouse gases and more than 6,000 tons of carcinogens have been eliminated with more being eliminated every day. Our customers are compliant with new emissions laws when a unit is added to their midstream equipment. The creation of ESG.cloud will help to measure, monitor, and manage compliance. Real time data from the reboiler, contactor, BTEX system, VRU, natural gas engine, combustor or any other emissions producing device, sits securely and easily accessible, on the Spiral X cloud server.

### 1.2.1 INEFFICIENCIES CAN BE COSTLY

Having emissions problem can be costly. By being more efficient in the overall system, companies are gaining 10's of millions of dollars annually. Knowing where to look for these inefficiencies in the design of midstream system becomes more imperative with EPA shutdowns in the works, and more strict guidelines to follow.

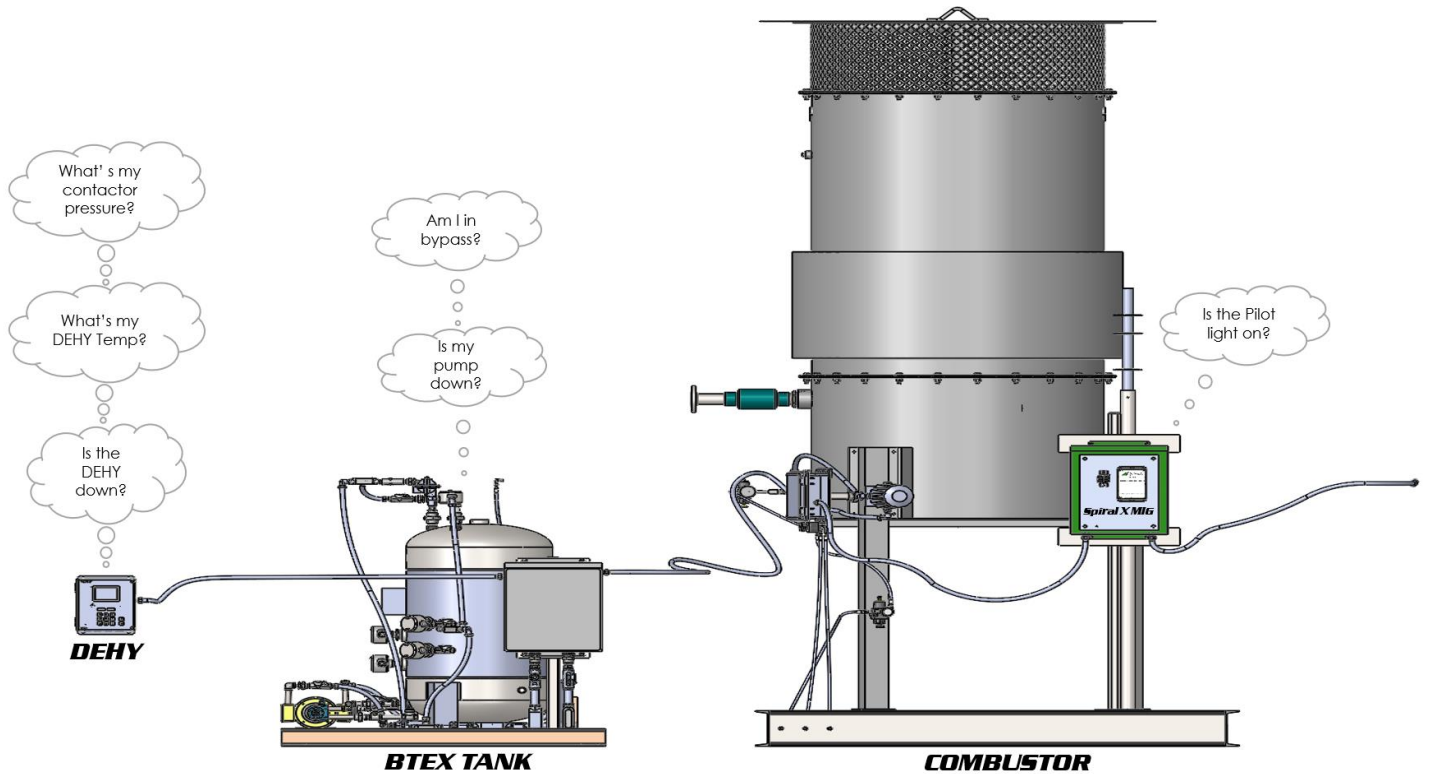


FIGURE 1-MIG FUNCTIONALITY

In the diagram above, is a Profire connected to both a DEHY system and BTEX system. Possible inefficiencies in the DEHY's temperature, contact pressure, or flow rate could attribute to possible emissions issues downstream. A system in bypass is another tell-tale sign of a systems failure. Finally, destruction of harmful VOC's is pivotal to emissions compliance. Destruction of VOC's cannot occur if the pilot light is out on the destruction unit. Failure of the pilot light ignition could mean the venting of harmful VOC's into the atmosphere, putting people in the vicinity of the unit in grave danger. This happens more times than not before anyone is notified of a problem. How can we be more efficient in our response? What tools are at our disposal? How does one utilize such tools to head off these dangers?

## 2. MIG

Being proactive instead of reactive saves company, time, resources and money. How many hours have been spent driving to a site just to find the issue reported wasn't what was actually happening? Causing you to waste more time diagnosing the real issue? Spira X has the tool the oil and gas industry needs.

### 2.1 WHAT IS IT?

The MIG or Modbus Internet Gateway is the workhorse of the Spira X communication system on the ESG platform (Figure 2). It is programmed to collect critical data, already recorded from the Modbus registers. The program then sends the data on the Spira X Cellular Network to the ESG.Cloud software application.

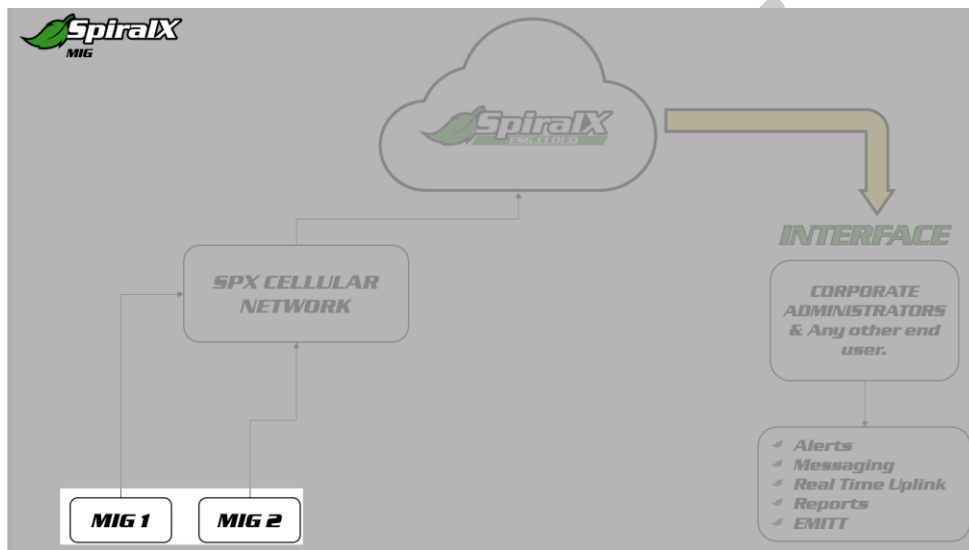


FIGURE 2-SPIRAL X ESG PLATFORM (MIG)



FIGURE 3-MIG NEMA 4 CASE

It is housed in a NEMA 4 sealed and potted box. This makes the unit itself Class 1 Div. 2 suitable by encasing all, exposed electrical components in an insulated material.

The MIG mounting assembly boast the following features in Figure 4 below:

- Antenna extender pole made of galvanized steel, extends upwards to 20 ft. This ensures the antenna attached can reach any close cellular signal.
- Power and data connections are fused with class 1 div 2 rated terminal blocks.
- All fittings and flexible tubing are seal tight and water resistant.
- Data communication with twisted and shielded wire to rid the system of noise interference.
- The system is driven with 24VDC power supplied by the user.
- A solar powered option on the system that uses 24VDC rechargeable batteries for more rural applications is also available.

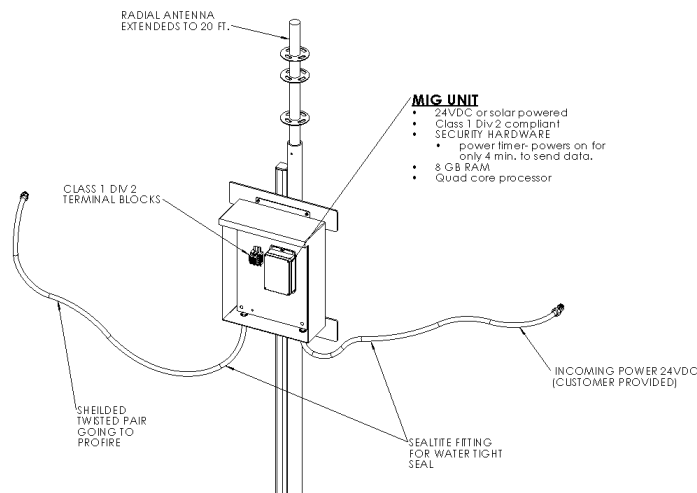


FIGURE 4-MIG ASSEMBLY

## 2.2 MIGS' ROLE IN GOVERNANCE

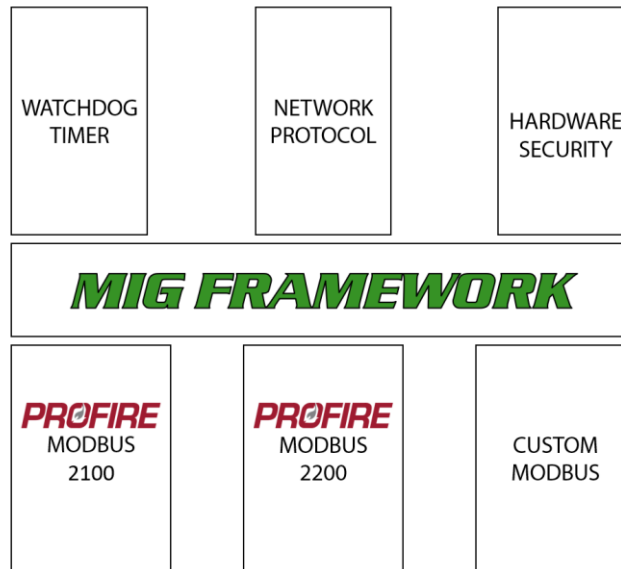


FIGURE 5-MIG FRAMEWORK

The MIG's role in Governance is to gather the information a company will eventually use to make critical decisions to save people's lives. This is achieved through the interconnected MIG Framework.

### 2.2.1 Watchdog timer

The MIG is outfitted with a timer that turns the on-board computer on and off in ten-minute increments. This shut off and on protocol is built into the system to ensure no third party can enter the system. The data is quickly gathered and sent. The shutdown process is immediately executed.

### 2.2.2 MIG REGISTERS

The MIG talks to the already preprogrammed registers on the Profire. This makes a seamless transfer of data to fight corruption and data loss. The following I/O digitals, analogs, and any sensor needing to be checked can be tailored to the users' needs:

- BTEX
- High Temp T/C
- Process T/C
- Aux T/C
- 4-20mA Level
- 4-20mA Pressure
- Pilot Status
- High Fire Status
- Reboiler
- High Temp T/C
- Process T/C
- Aux T/C
- 4-20mA Level
- 4-20mA Pressure
- Run Status

This isn't all the registers the MIG is capable of reading, rather they are the ones currently being monitored by the program.



### 2.2.3 Hardware Security

No user company data is stored onsite. Everything is sent to the secured private server of the Interfacing Corporate Administrator, Groups and Users.

### 2.2.4 Profire Modbus

The MIG reads Profire 2100 and Profire 2200 Modbus. There only needs to be one Modbus for the series connected Profire. This lowers initial setup costs, increases efficiency in the system and prohibits overload of data to the MIG termination point.

### 2.2.5 Custom Modbus

The use of the MIG isn't just for Profire. It can be programmed from any Modbus the customer currently uses. This keeps the user from having to redesign the system or change components. Which all attribute to higher transition costs.

## 3. SPIRAL X CELLULAR NETWORK

The SPX Cellular Network is AICPA SOC2 Type II Certified and is compatible with over 400 cellular networks. This provides a seamless experience for the end user.

The SPX Cellular Network is the highway, in which the data gathered by the MIG, is securely transferred on a wireless network to the ESG.cloud server for the user highlighted in the diagram below. The 4G LTE radial antenna, boasts a 10-12dBi, at 700 – 2750 MHz makes the range of this antenna a stellar choice for data transfer in rural areas.

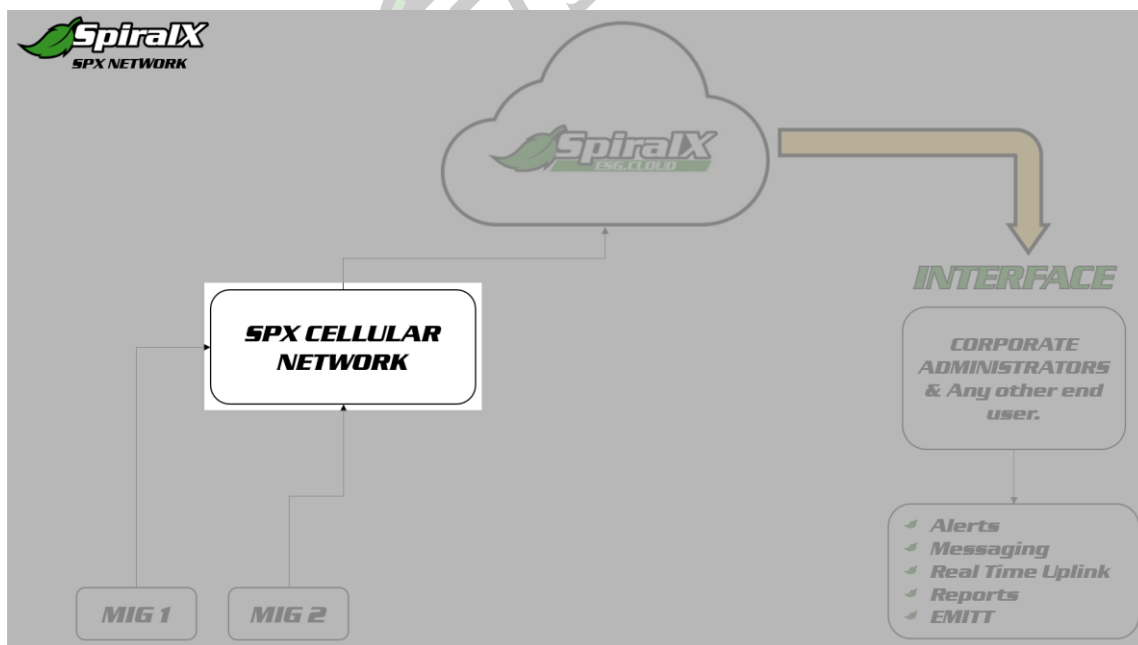


FIGURE 6-SPIRAL X ESG PLATFORM (SPX CELLULAR NETWORK)

## 4. ESG.CLOUD

ESG.Cloud is a cloud-based software application that connects the hardware components of the MIG and encompasses the security measures of its own. The goal is to get the data in the hands of the end user. This is achieved through, high security protocols, intermittent data connections, and sustained graphical data represented to make a clear and concise representation for each user.

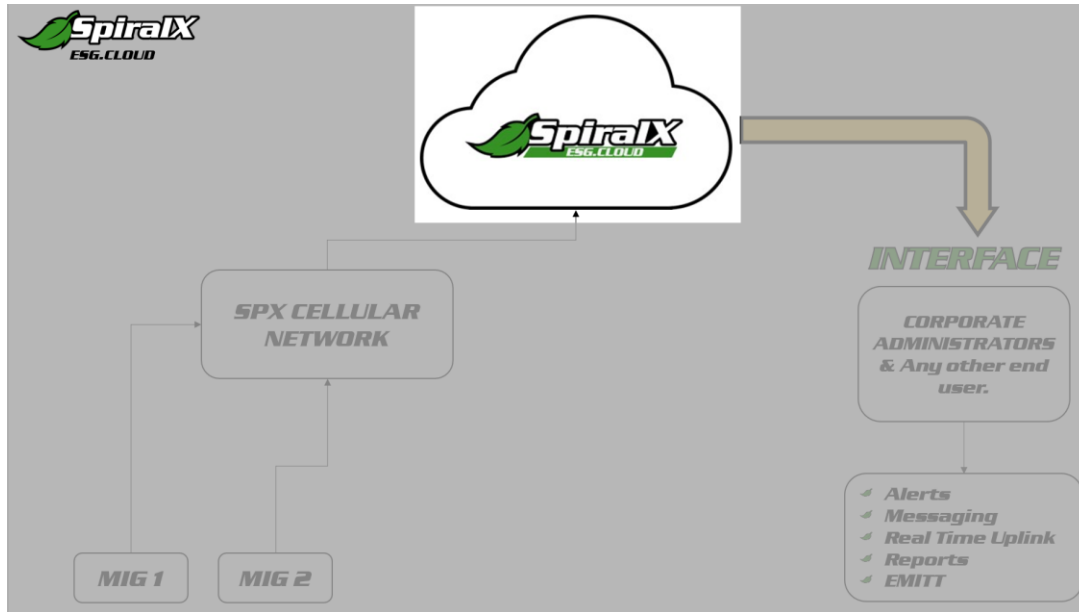


FIGURE 7-SPIRAL X ESG PLATFORM (ESG.CLOUD)

The ESG.Cloud Framework is made up of different servers called nodes, with SPX ADMIN and the MIG Network being the foundation of the software system. Without the two foundations, the nodes would not execute.

Each node is an individual cloud-based server for the customer. This ensures no "cross talk" of data. Since each customer is on their own server, by design it is more secure. There will be more discussed on security in the next section. Finally, for each Node, the Corporate Administrator assigns who has access to the data collected. This gives full control of critical company data to only selected amount of people.

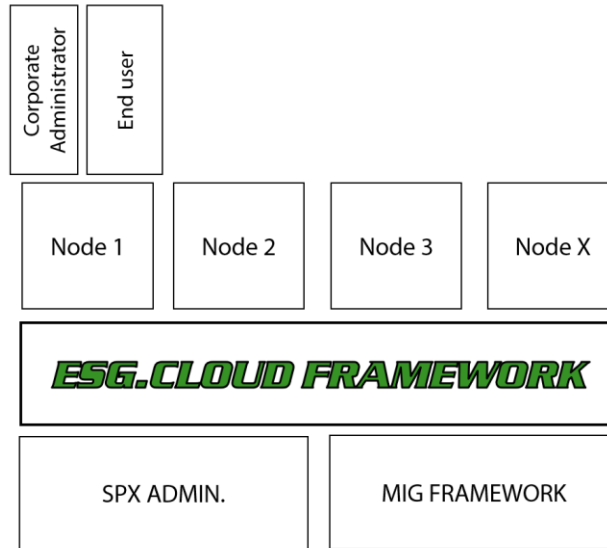


FIGURE 8-ESG.CLOUD FRAMEWORK

## 4.1 SECURITY

ESG.Cloud performs the following key functions:

- Daily and weekly backups of the server
- DDos monitoring on each node
- HTTP content security
- SSH passkey encryption
- Password hashing to protect the system through logins.
- Security and monitoring software

## 4.2 GOVERNANCE INTERFACE

The Governance Interface is the heart of the entire journey through the ESG Platform. It is where the end user and inefficiencies in the system meet to reconcile any issue that may have arisen. These issues are easily seen through the portal of ESG.cloud, user text message alerts, and other tailored features of the ESG.cloud platform.

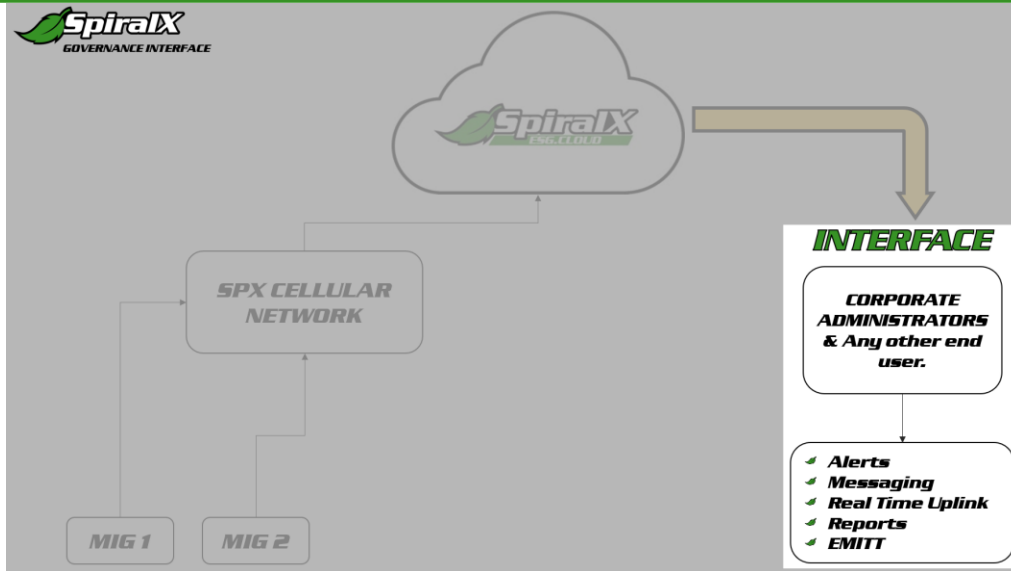


FIGURE 9-SPIRAL X ESG PLATFORM (INTERFACE)

#### 4.2.1 Corporate Administrator

The Corporate Administrator (CA) will have overall access and is solely responsible for internal user access. The CA can:



##### Node 1

###### Security

- ✔ DDoS monitoring
- ✔ HTTP content Security
- ✔ Password hashing
- ✔ SSH Passkey encryption
- ✔ Dedicated server for each corporation
- ✔ Daily and weekly backups

###### Corporate Administrator

- ✔ Selection of End User
- ✔ Groups
- ✔ Alerts-Messaging
- ✔ EMITT Data
- ✔ Reporting

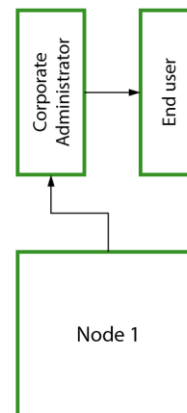


FIGURE 10- NODE HIGHLIGHTS

- Assign groups

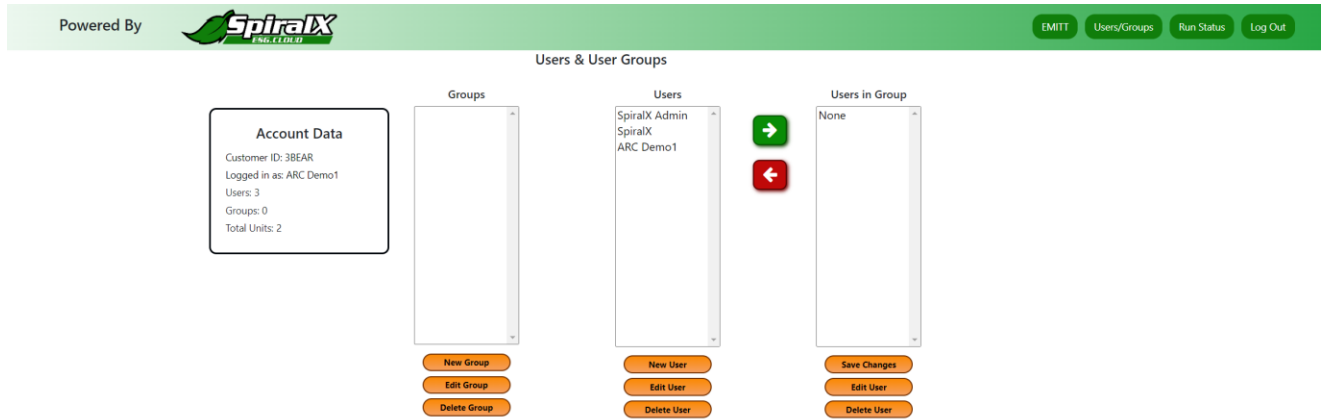


FIGURE 11-GROUP AND USER ASSIGNMENT SCREEN

- Assign users

- The CA adds all the info needed. The password will be set by the user. Email and cellular are needed for any kind of alerts or messaging when there are issues, (see Messages and Alerts).
  - make the certain user(s) an administrator.
  - turn off and on the notifications.

- Setup parameters for temperature settings on different components of the BTEX system

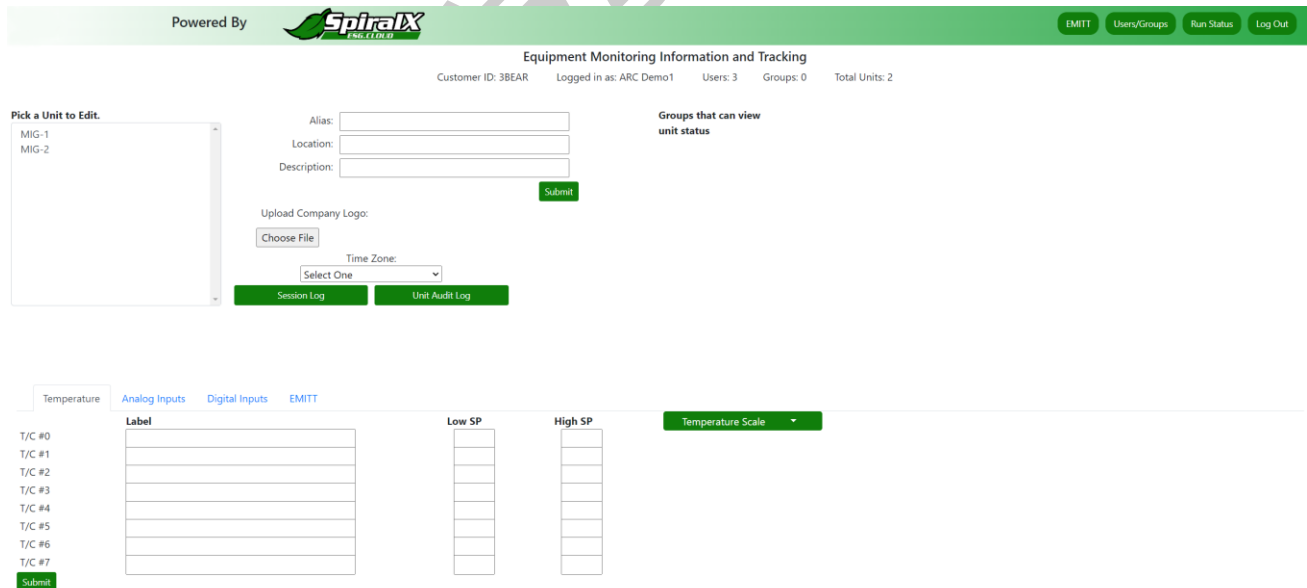
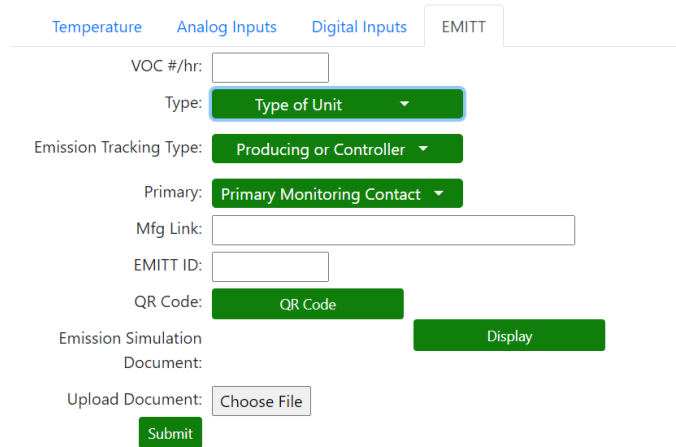


FIGURE 12-MIG CONFIGURATION CENTER

- The bottom tabs allow the CA to customize the experience by:
    - setting direct temperature parameters
    - register what analog/digital inputs to read.

- Gather EMITT data and view the unique QR code for the Particular MIG highlighted.



The screenshot shows the 'EMITT' tab in a software interface. It contains several input fields and dropdown menus for configuring emission data. The fields include: VOC #/hr (text input), Type (dropdown menu with 'Type of Unit' selected), Emission Tracking Type (dropdown menu with 'Producing or Controller' selected), Primary (dropdown menu with 'Primary Monitoring Contact' selected), Mfg Link (text input), EMITT ID (text input), and QR Code (a green button labeled 'QR Code'). There are also buttons for 'Display' and 'Submit', and an 'Upload Document' section with a 'Choose File' button.

FIGURE 13-EMITT DATA SETUP SCREEN

- This is set by local laws and must be available for any inspection that is taking place. This puts the information in the hands of inspectors.
- There is also a QR code unique to the MIG that makes accessing information easier as well.
- Manage multiple locations that have the MIG system outfitted.

#### 4.2.2 End User

Any user can view temperatures on an easy dropdown menu labeled in the screenshot below. The user can choose temperatures, analogs, digitals, and analytics. The graph is automatically populated when the subject is selected. The example below a swing of about 4°F difference between 6:25am and 8:24am. On the left side is the current readout of the temperature.

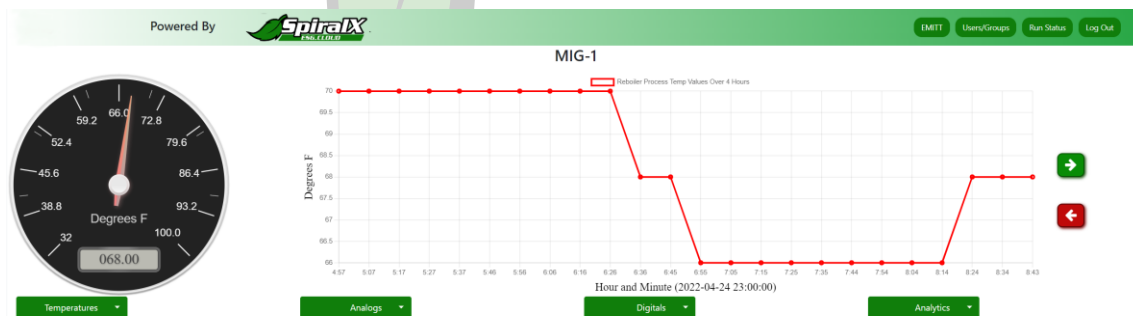


FIGURE 14-REAL TIME GRAPHICAL DATA OF MIG THERMOCOUPLE

ESG.Cloud keeps critical history of the system in question. These reports can easily be brought up and selected to share with teams within the company's own walls.

Back Alert History for MIG-1 - BTEX High Temp

Date & Time	Monitored Point	Recipients
04/07 11:38 am	75.2F (SP: Low: 32)	SpiralX Admin
03/31 10:24 am	0F (SP: Low: 32)	SpiralX Admin
03/29 12:00 pm	73.4F (SP: Low: 32)	SpiralX Admin
03/29 11:08 am	0F (SP: Low: 32)	SpiralX Admin
03/29 10:47 am	73.4F (SP: Low: 32)	SpiralX Admin
03/23 11:48 am	0F (SP: Low: 32)	SpiralX Admin
03/22 01:11 pm	80.6F (SP: High: 100)	SpiralX Admin
03/22 01:10 pm	0F (SP: Low: 32)	SpiralX Admin
03/14 10:49 am	86F (SP: High: 100)	SpiralX Admin
03/14 10:46 am	0F (SP: Low: 32)	SpiralX Admin
03/09 12:36 pm	82.4F (SP: Low: 32)	SpiralX Admin
03/09 12:25 pm	0F (SP: Low: 32)	SpiralX Admin
02/25 08:41 am	71.6F (SP: Low: 32)	SpiralX Admin
02/01 11:39 am	0F (SP: Low: 32)	SpiralX Admin

FIGURE 15-ALERT HISTORY

At a macro level, the daily snapshot of analytics gives a bird's eye view of how the system is performing and what metrics are and aren't being met by the company's standards.

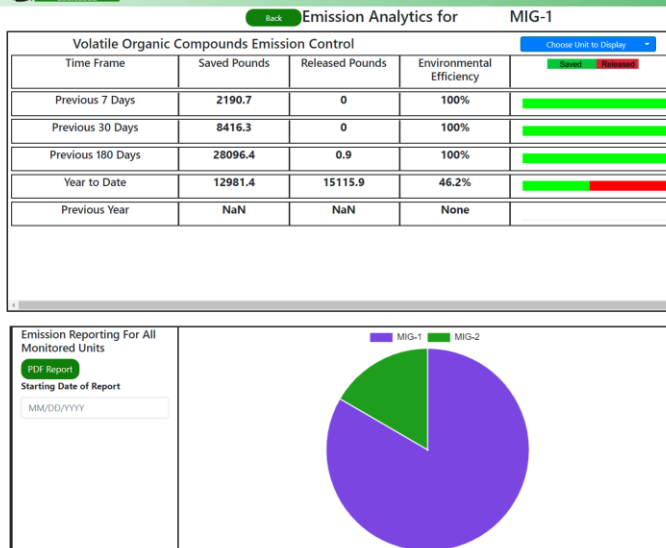


FIGURE 16-SNAPSHOT OF ANALYTICS

Shutdown analysis is a standard with the service. The color coding is used for the user to easily pick out where the issues might not be complying. The standards set by the CA. The example below shows the BTEX Aux Temp was not in the range that was established.

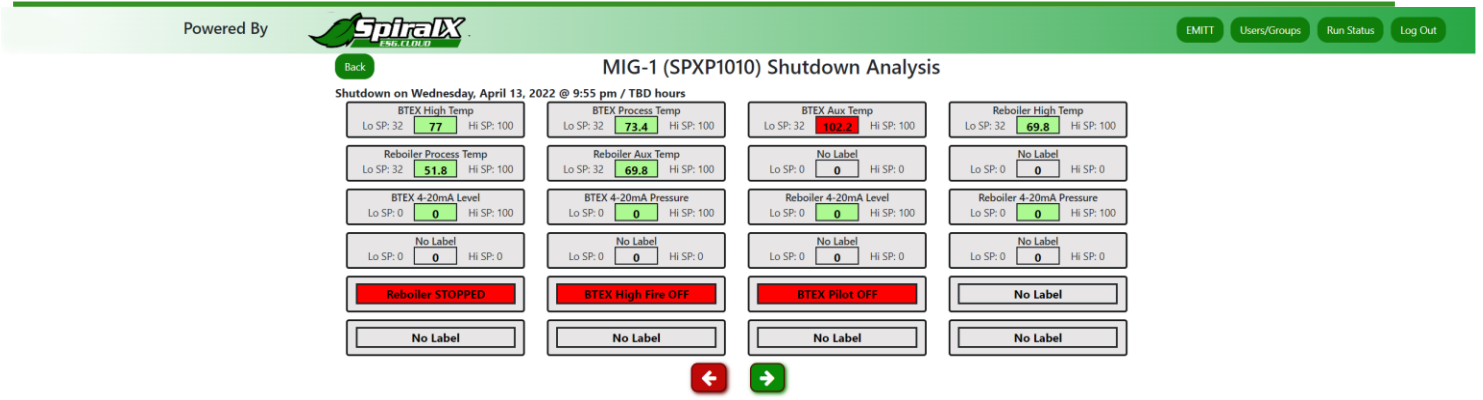
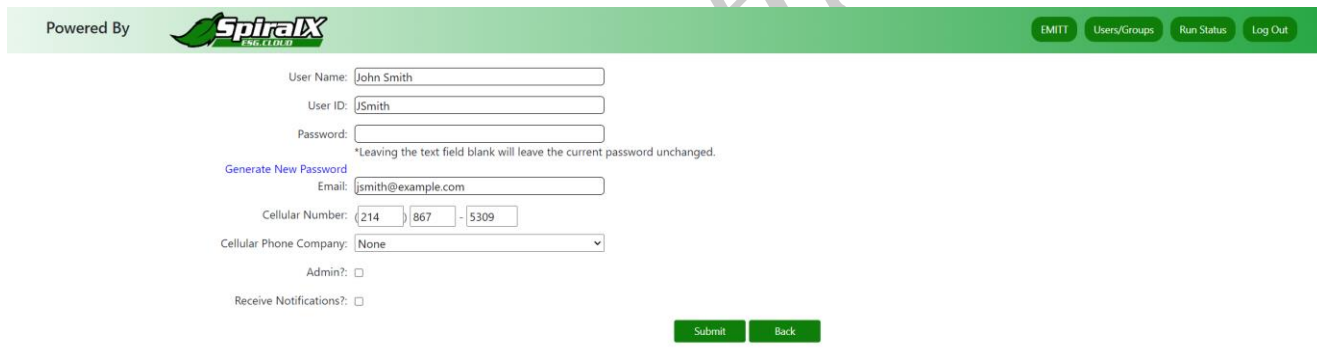



FIGURE 17-SHUTDOWN ANALYSIS

The proof of compliance is getting stricter by the day. Eventually, the EPA will require proof you ARE complying. In response to this, the data collected goes back as far as five years. Furthermore, an easy report that states this in a presentable format to any official is generated at the touch of a button. An example copy is shown in Appendix 6.1.

### 4.2.3 Messaging and Alerts

The CA can select what people within the organization can get alerts when parameters are not met.



Powered By  EMITT Users/Groups Run Status Log Out

User Name:

User ID:

Password:

\*Leaving the text field blank will leave the current password unchanged.

[Generate New Password](#)

Email:

Cellular Number:   -

Cellular Phone Company:

Admin?:

Receive Notifications?:

 FIGURE 18-USER SETUP SCREEN

If at any point, the data input by the Administrator is not within the range, a text alert to the users' cell phone will be initiated. Subsequently, when the SP is back within normal range a message is also sent. Below are examples of the alerts that will be displayed.





FIGURE 19-MESSAGE ALERT OF BTEX SYSTEM

In the above example, the BTEX Aux Temperature threshold was reached, and the alert came through with the date, current temperature, and the set point (SP) of 100°F the BTEX is set too.

## 5. CONTACT US

Our Engineering Team is located at our facility in Fate, TX and are available to you for all custom design questions. If more information is needed, please feel free to contact us.

- General questions
- Data sheets
- Custom build questions

Engineering Phone: **(469) 480-8802 ext. 109**

-OR-

Visit us on the web at [www.spiralxllc.com](http://www.spiralxllc.com) for:

- business information
- ESG, or to request a copy of the Environmental Manual.

## 6. APPENDIX

### 6.1 A



July 6, 2021

### EMISSION ANALYTICS for SPXC1012

#### EMITT Data

EMITT I.D.	134R46
Alias	Dehy/BTEX Station 1
Location	32.92363422723435, -96.40578170525636
Description	Dehy/Btex station running SpiralX ESG unit# 1
Primary monitoring Contact	Russell Pritchett
QR Code	



#### VOC Emission Control Data

Time Period	Environmental Efficiency	VOC's captured	VOC's released
6/30/21 – 7/6/21	95.5%	3208.3 lbs	150 lbs
6/6/21 – 7/6/21	96.1%	13843.4 lbs	555 lbs
1/6/21 – 7/6/21	95.7%	25181.1 lbs	1126.7 lbs
1/1/21 – 7/6/21	95.7%	25258.6 lbs	1126.7 lbs

This unit ranks 2nd for the number of units in this grouping.

These efficiencies are based upon real time measurement of when the system is in service and the simulation calculations, which can be found under EMITT for this unit.

For any questions, please contact Bryan Holland at [bholland@spiralxllc.com](mailto:bholland@spiralxllc.com)

## 7. REFERENCES

- [1] K. Coan, "Searching for methane leaks, scientists find "ultra emitters"," ARS Technica, 2 3 2022. [Online]. Available: <https://arstechnica.com/science/2022/03/fixing-ultra-emitting-methane-leaks-is-a-low-cost-climate-win/>. [Accessed 1 4 2022].

