FLOWMIXER™
USER MANUAL

SCALABILITY AND EASE OF USE FOR ALL MIXING APPLICATIONS

This manual provides essential safety instructions, system information, operating procedures, maintenance guidelines, and technical support details for the FlowMixer™ Mixing System. Please read it carefully before operating the equipment.

CAROLINA COMPONENTS GROUP
Flow Through Us

919.635.8438
www.carolinaflow.com
support@carolinaflow.com

1. SAFETY & GENERAL INFORMATION

1.1 Safety Warning

For your personal safety and to protect equipment, please observe the following warnings:

Danger (!):
Indicates that failure to follow proper precautions could result in death or serious injury.

Warning (!):
Indicates that improper handling may lead to minor injuries.

Caution:
Indicates that failure to observe instructions might cause property damage.

Always adhere to the highest applicable warning level when multiple risks are present.

1.2. QUALIFIED PERSONNEL

This system is intended for operation only by trained and qualified personnel. Operators must follow all instructions and safety precautions provided in this manual and any accompanying documents.

1.3. USE OF CCG PRODUCTS

- Operate the system strictly in accordance with this manual and the accompanying documentation.
- Ensure that all specified accessories and optional modules are used as intended.
- Only qualified personnel should perform operations, maintenance, and troubleshooting.

1.4. TRADEMARK & LIABILITY NOTICE

- Trademark:
  All items marked with © are registered trademarks of Carolina Components Group. Unauthorized use by third parties may infringe on trademark rights.

- Exclusion of Liability:
  While we strive for consistency between this manual and the actual hardware/software, discrepancies may occur. Carolina Components Group assumes no liability for errors or omissions. Always refer to the latest technical documents and consult our service team when in doubt.

1.5 LEGAL DISCLAIMERS

- **Biotech Manufacturing Use:**
  This product is designed and intended for biotech manufacturing applications. Users must ensure that the system is operated strictly according to the instructions provided and in compliance with all applicable local, state, and federal regulations.

- **Intended Use & Limitations:**
  The system is not intended to substitute for professional laboratory practices or regulatory compliance procedures. Carolina Components Group does not guarantee the product's suitability for any application other than its intended use. Modifications or misuse may void warranties and could lead to hazardous conditions.

- **Warranty Disclaimer:**
  The product and its documentation are provided "as is" without any express or implied warranties, including, but not limited to, warranties of merchantability or fitness for a particular purpose. The manufacturer shall not be liable for any direct, indirect, incidental, or consequential damages arising from its use.

- **User Responsibility:**
  It is the user's responsibility to implement adequate safety measures and to ensure that the system's operation does not conflict with specific biotech process requirements or quality standards. Carolina Components Group shall not be responsible for any loss, contamination, or adverse outcomes resulting from failure to adhere to recommended practices.

- **Regulatory Compliance:**
  Users must verify that the system complies with any additional regulatory standards required for their specific applications in the biotech industry. Carolina Components Group does not assume responsibility for regulatory non-compliance issues arising from unauthorized modifications or improper use.

TABLE OF CONTENTS

3. SYSTEM INFORMATION

3.1 Overview

The CCG Benchtop Mixing System is designed for small-volume liquid–liquid and liquid–solid mixing as well as storage applications. It is ideal for volumes between 750 mililiters and 30 liters. The system integrates:

- A benchtop mixing controller with an industrial computer, PLC, and safety features.
- A mixing base equipped with a magnetic drive motor.
- A Tote designed to securely hold single-use mixing bags.

The user-friendly software supports multiple access levels, data export, and audit trail functionality. Additional functional modules are available to suit specific application needs.

3.2 SPECIFICATIONS

ITEM	SPECIFICATION
Controller Dimensions	400 × 300 × 250 mm
Base Dimensions	400 × 400 × 167 mm
Controller Material of Construction	ABS
Base Material of Construction	ABS
Non-Jacketed Material of Construction	PP (Polypropylene)
Jacketed Tote Material of Construction	304 Stainless Steel
Rated Voltage	100–240 VAC / 50–60 Hz
Rated Current	4A @ 120VAC, 2A @ 240 VAC
Rated Power	480 W

3.3 ORDERING INFORMATION

PART NUMBER	SET/PART	NAME	DESCRIPTION	NOTE
CCGSUM-BCU-V1	Set	Mixer Controller	Includes industrial computer, buzzer, emergency stop, PLC, etc.	Required
CCGSUM-BMB-V1	Set	Mixer Base	Includes weighing base, drive	Required
CCGSUM-BTA-2LT-PP, CCGSUM-BTA-5LT-PP, CCGSUM-BTA-10LT-PP, CCGSUM-BTA-20LT-PP, CCGSUM-BTA-30LT-PP	EACH	Non-Jacketed Tote		Optional
CCGSUM-BTA-2LT-SS, CCGSUM-BTA-5LT-SS, CCGSUM-BTA-10LT-SS, CCGSUM-BTA-20LT-SS, CCGSUM-BTA-30LT-SS	EACH	Jacketed Tote		Optional
CCGSUM-BTA-S-MTPH, CCGSUM-BTA-T-MTPH, CCGSUM-BTA-C-MTPH	EACH	pH Module	pH Probe and Transmitter	Optional
CCGSUM-BTA-S-TP, CCGSUM-BTA-C-TP	EACH	Temperature Sensor	Temperature sensor	Optional

4. INTERFACE INFORMATION

4.1 Controller Rear Panel

The back panel of the benchtop mixer controller includes the following connection ports:

- **Mixer A/B/C:**
  Connection ports for the respective bases.
- **TCU A/B/C:**
  Connection ports for Temperature Control Units.
- **pH A/B/C:**
  Ports for connecting pH instruments.
- **Temperature A/B/C:**
  Ports for temperature measurement instruments.
- **RJ-45 IOT:**
  Ethernet port for network connectivity.
- **RJ-45 HMI:**
  Ethernet port dedicated to the Human-Machine Interface.
- **USB:**
  USB port for peripheral devices.
- **Power:**
  Dedicated power supply port.

5. QUICK START GUIDE

Follow these steps for initial setup and operation:

Power Connection & Startup

- Connect the power cord to the mixer's power port and to a 100–240 VAC outlet.
- Press the power button to turn on the system.

Communication Setup

- Connect the Mixer communication cable between the Controller and the desired Base Channel (A, B, or C).
- Connect any instrument cables as required to the desired channel

Login

- Log in to the system (details will be provided upon completion of automation team output).

Tote & Mixing Bag Installation

- Place the Tote onto the Mixing Base, aligning the center cut-out with the base post.
- Insert a single-use mixing bag into the Tote and seat the impeller in the mixing base post.

Process Parameter Setup

- Configure process parameters such as mixing speed, duration, and direction.

Start/Stop Mixing Operation

- To begin mixing, fill the bag with fluid and select "START" or "START ALL" on the interface.
- To stop, press "STOP" or "STOP ALL"

Shutdown

- Use the Power Icon on the HMI to properly shut down the mixer. Wait for the system to fully power down before disconnecting power to avoid damage.

6. SOFTWARE OPERATION

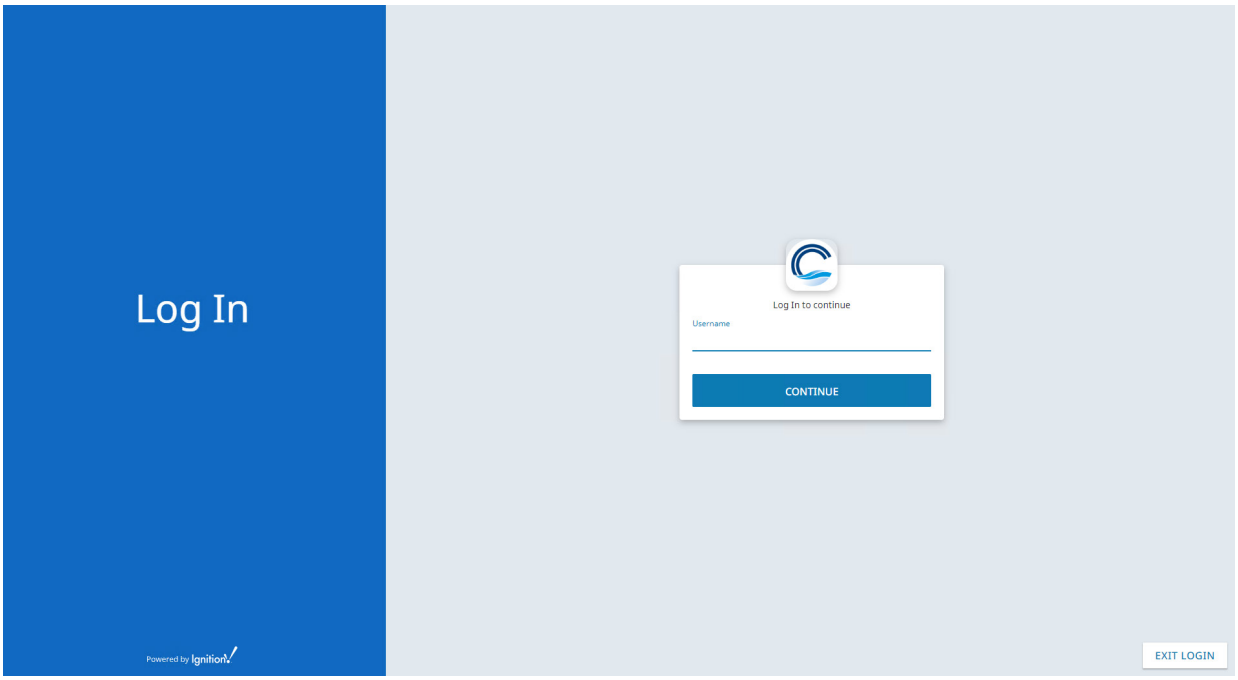
6.1 HMI Overview

After engaging power to the system, the Human-Machine Interface (HMI) boots into a Welcome Screen. To access the system, users must log in using credentials.

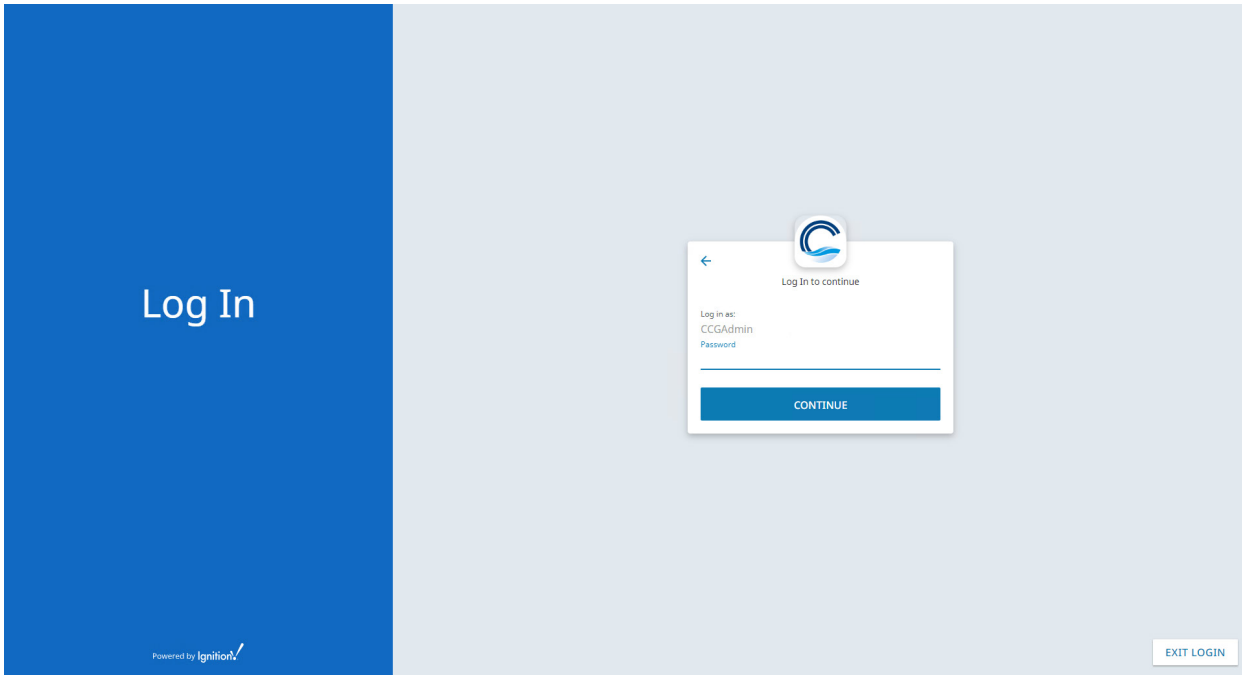
6.2 Welcome Screen

6.3 User Login, Logout & Power Off

Click Sign-In to log into system using valid credentials



Password Entry:



Click Sign-Out to log out of system.

6.3.1 Password Policy

Security Function Matrix

The secured function matrix is shown in the table below. An administrator can log in to the administrator account to configure specific permissions for group users.

FUNCTION	ADMIN	ENGINEER	OPERATOR	QA
Manual Control	X	X	X	-
Automatic Control	X	X	X	-
View Historic Record	X	X	X	-
View Batch Record	X	X	X	X
View Audit Record	X	X	-	X
View Alarm Record	X	X	X	X
Export Historic Record	X	X	X	-
Export Batch Record	X	X	X	X
Export Audit Record	X	X	-	X
Export Alarm Record	X	X	X	X
Date and Time Modify	X	X	-	X
View Presets	X	X	X	X
Edit Presets	X	X	-	-
Configure Alarm Parameters	X	X	-	-
Acknowledge Alarms	X	X	X	-
Calibrate Sensors	X	X	X	-
User Management	X	-	-	-

Password Policy:

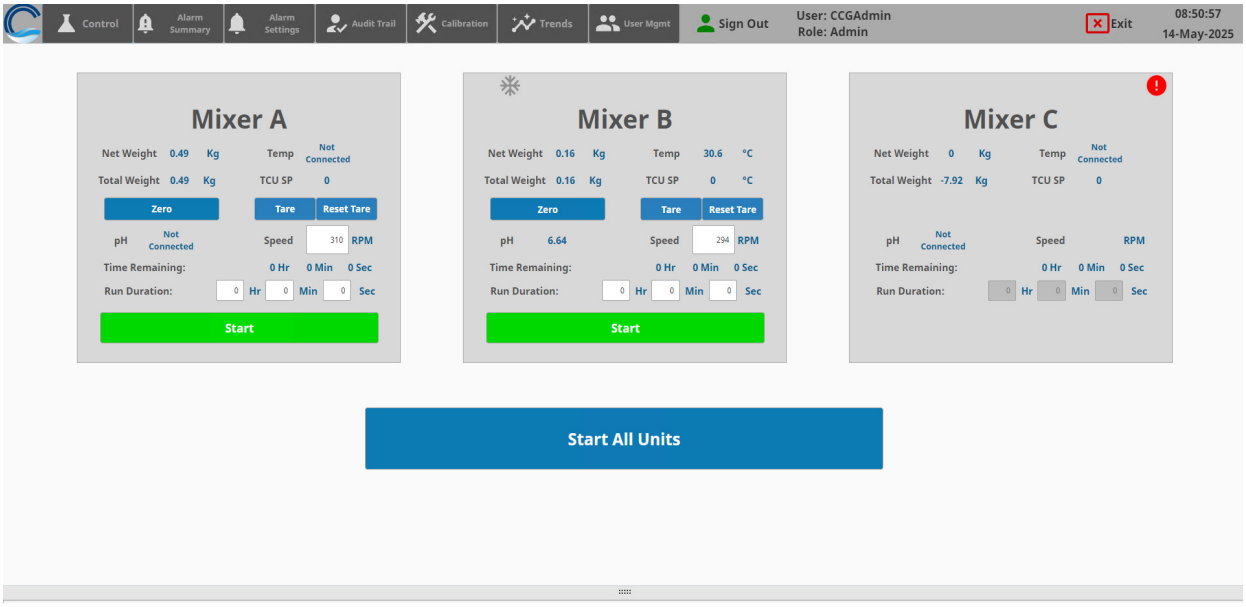
- Minimum password length: 8
- Minimum password history: 3
- Password expiration: 90 days
- Password complexity: Must include special characters, numbers, and upper-case characters

Click Sign-Out to log out of system.

6.4 Controls Screen

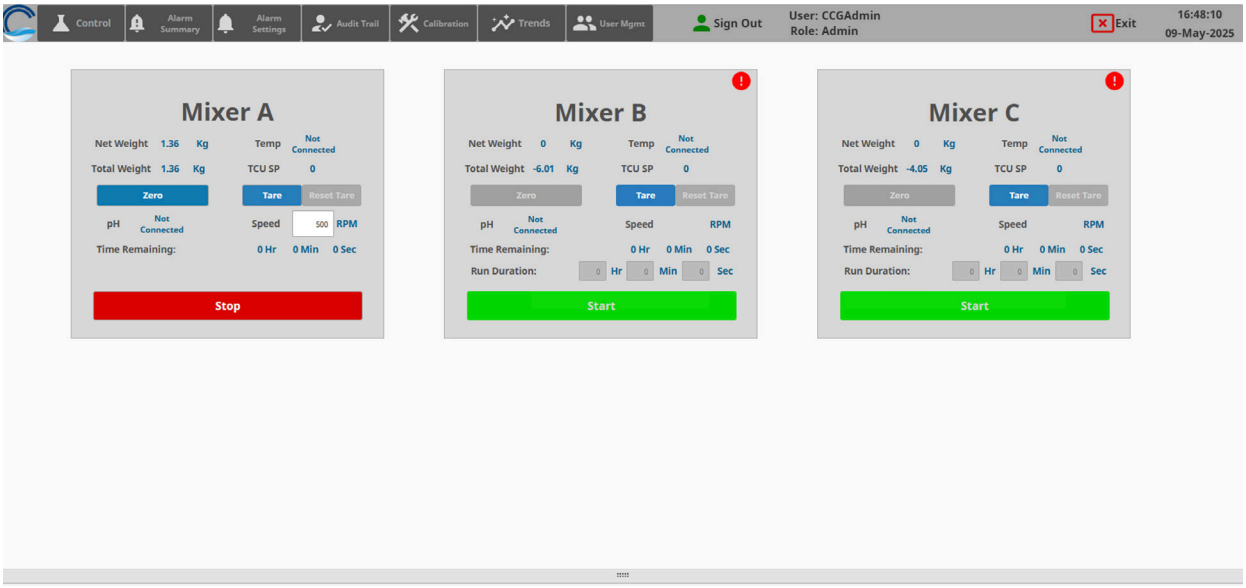
Real-Time Data:

- Displays instrument process variables (pH, temperature, agitator speed, and duration) in real-time.

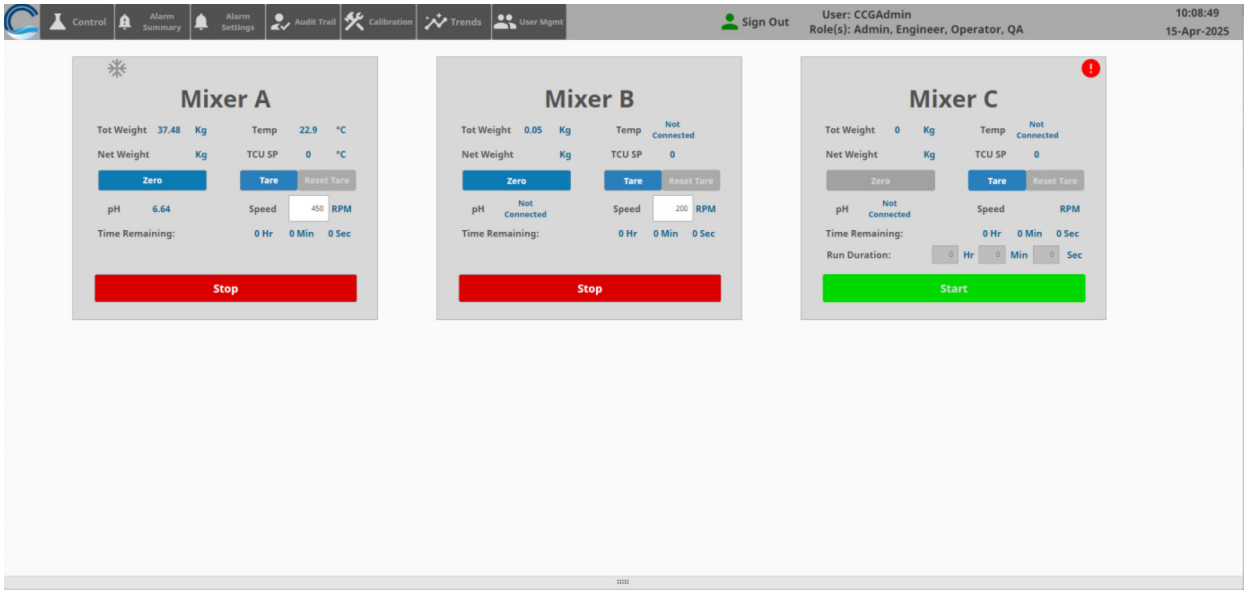


- Set mixing duration and speed.
  - To run continuously, set mixing duration to [HH:MM:SS - 00:00:00].
  - Mixing speed may be set between 0 and 500 RPM.

- Select Start to begin mixing at speed setpoint for desired duration.



- Select Stop to halt mixing
- Select Start All Units to start mixing on all connected Bases.



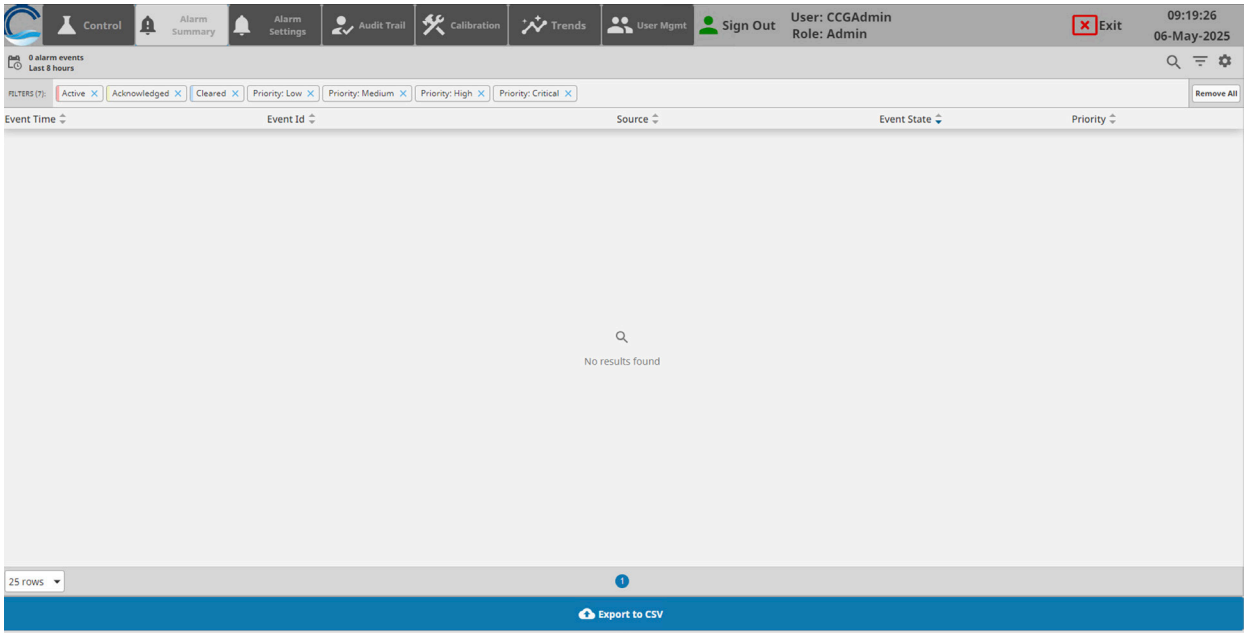
- When Temperature or pH instruments are connected, real-time process variables are displayed for the channel in which they're connected (A/B/C)

Temperature Control Unit (TCU):

- TCU Setpoint is displayed when a TCU is connected. Temperature process variable is sent to TCU for Feedback.
- **Active Alarms:** Displays active alarms. Alarms may be acknowledged

6.5 Alarm Summary

Alarm Summary: Displays active and inactive alarms. Alarms may be acknowledged

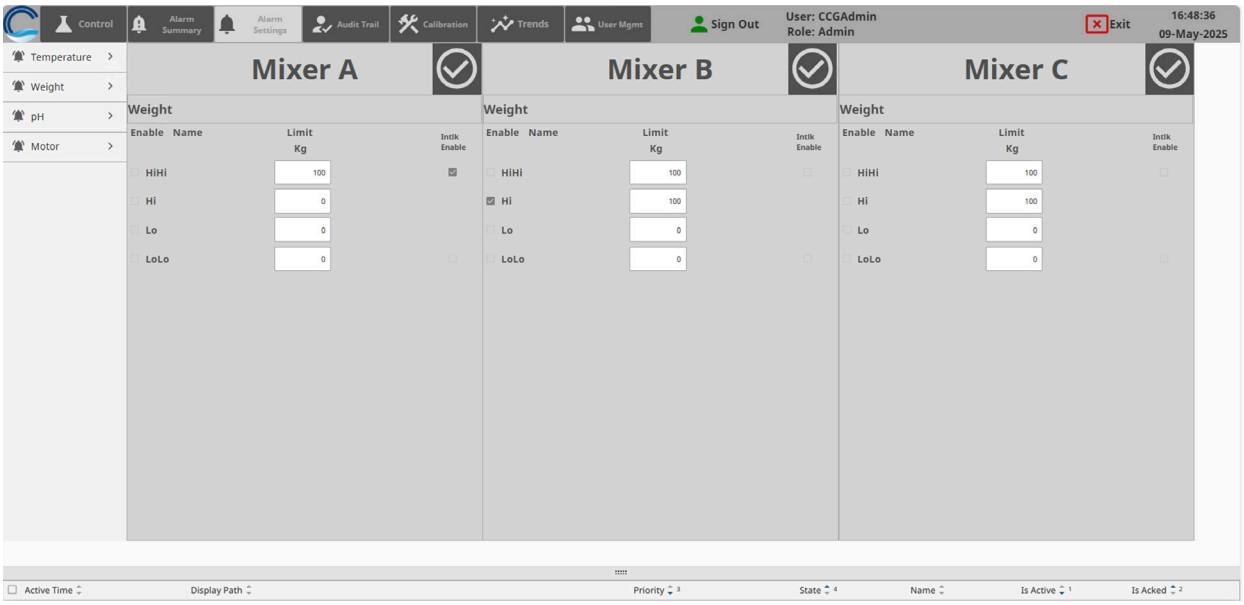


6.6 Alarm Settings

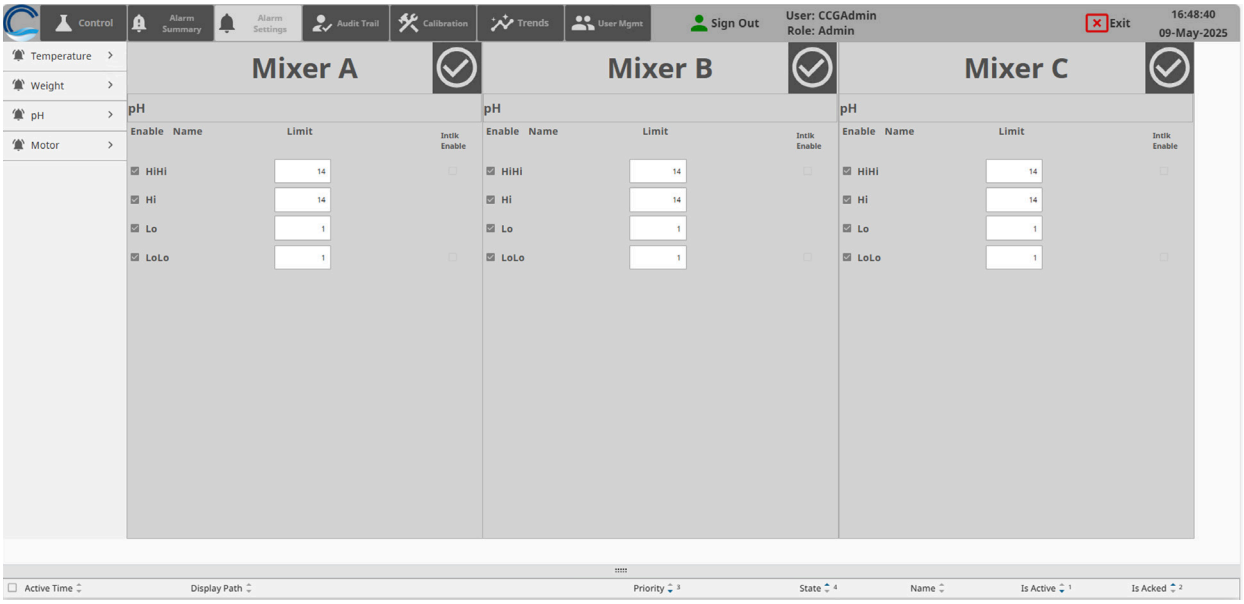
- **Alarm Parameters:** Set high-high (HiHi), high (Hi), low (Lo), low-low (LoLo) limits and PVBad for temperature, weight, pH, and motor (agitator speed).
- **Enable Alarms:** Select the check mark next to each tag to enable/disable.
- **Interlock:** Select interlock (Intkl Enable) to halt mixer function when limits surpass HiHi or LoLo Setpoints.
- **Acknowledge Alarm:** Acknowledge an interlocked alarm by selecting the large encircled checkmark for the affected Channel

Temperature Alarms:

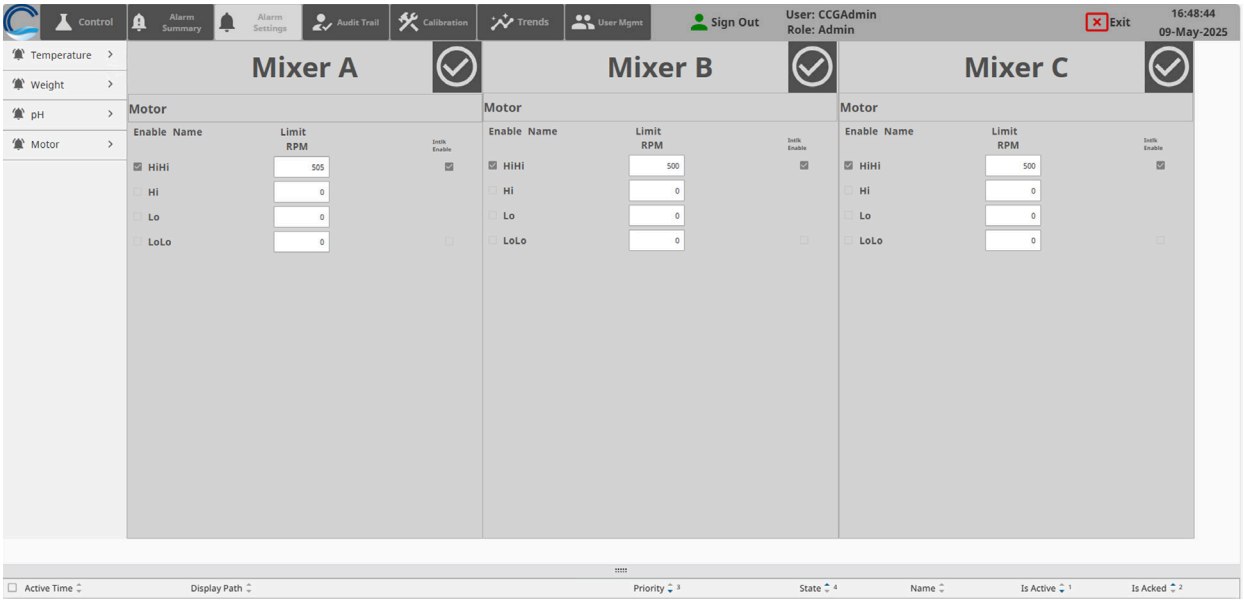
Weight Alarms:



pH Alarms:

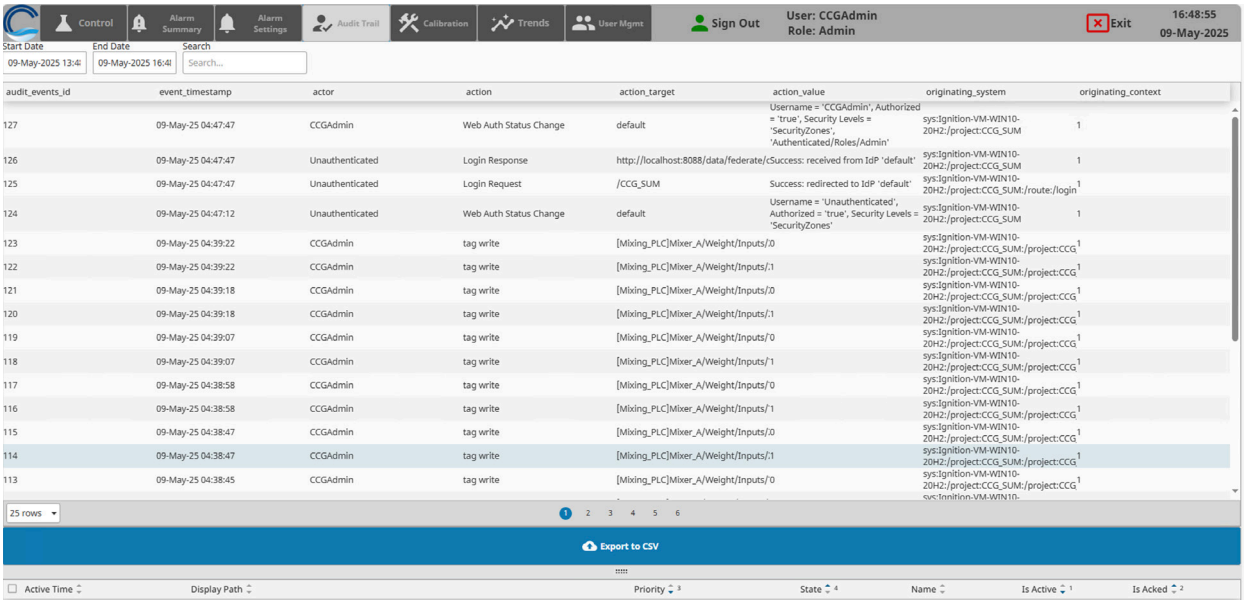


Agitator Speed Alarms:



6.7 Audit Trail

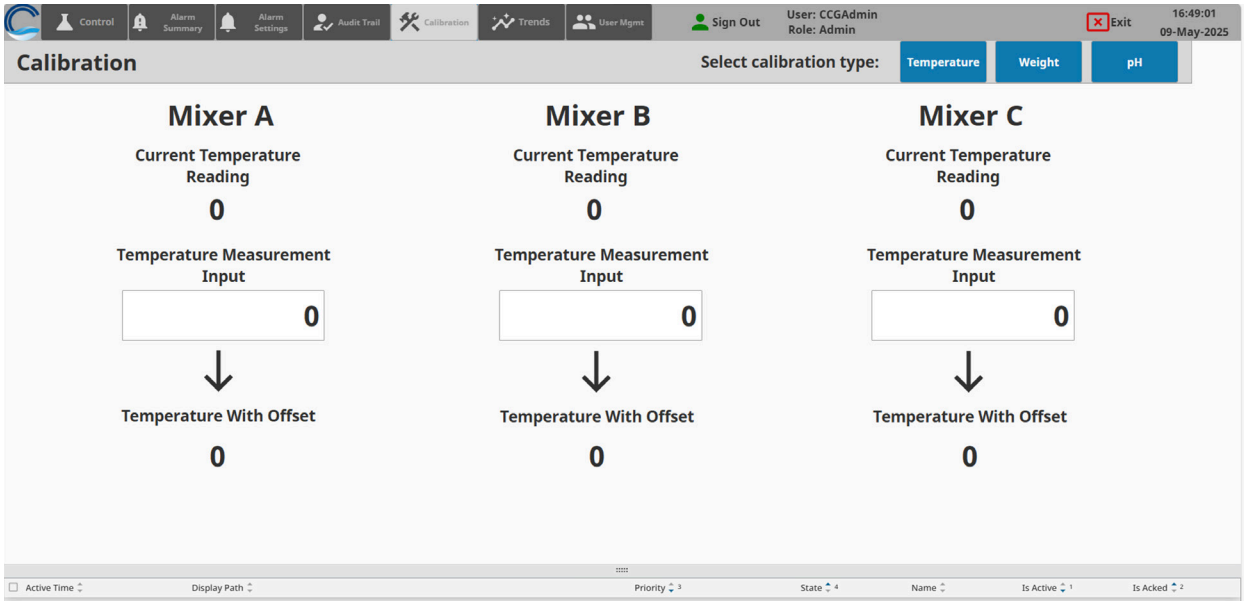
- **Audit Trail: Record** of all events
- **Export:** Records may be Exported by selecting the Export to CSV



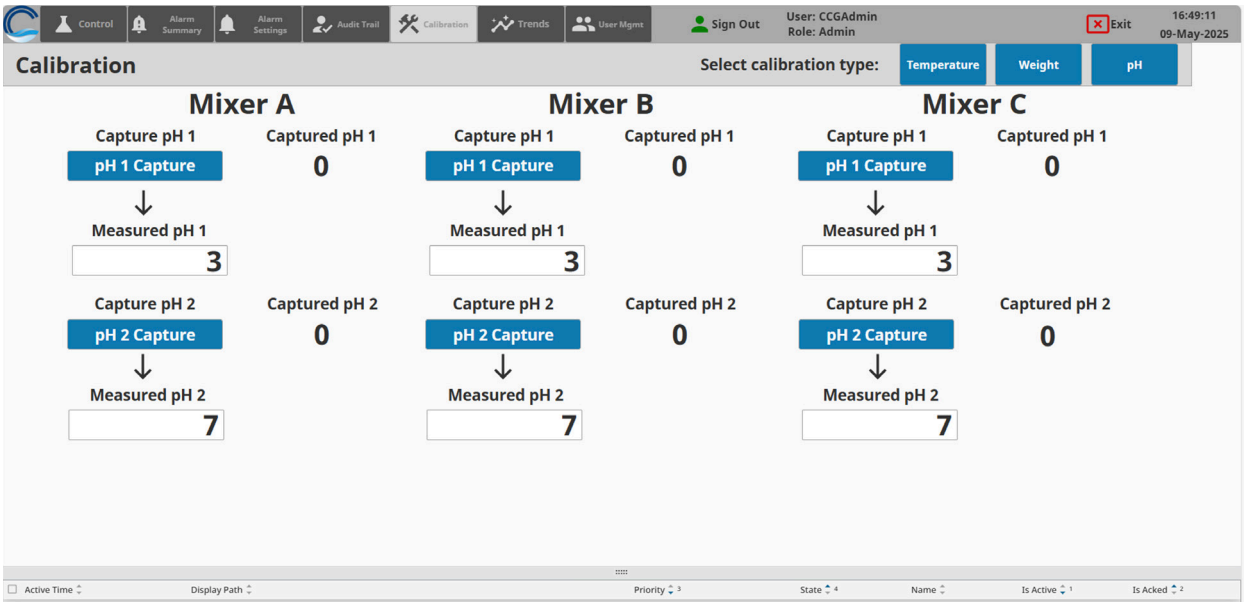
6.8 Calibration

Instrument Calibration: Temperature, Weight and pH calibration may be performed.

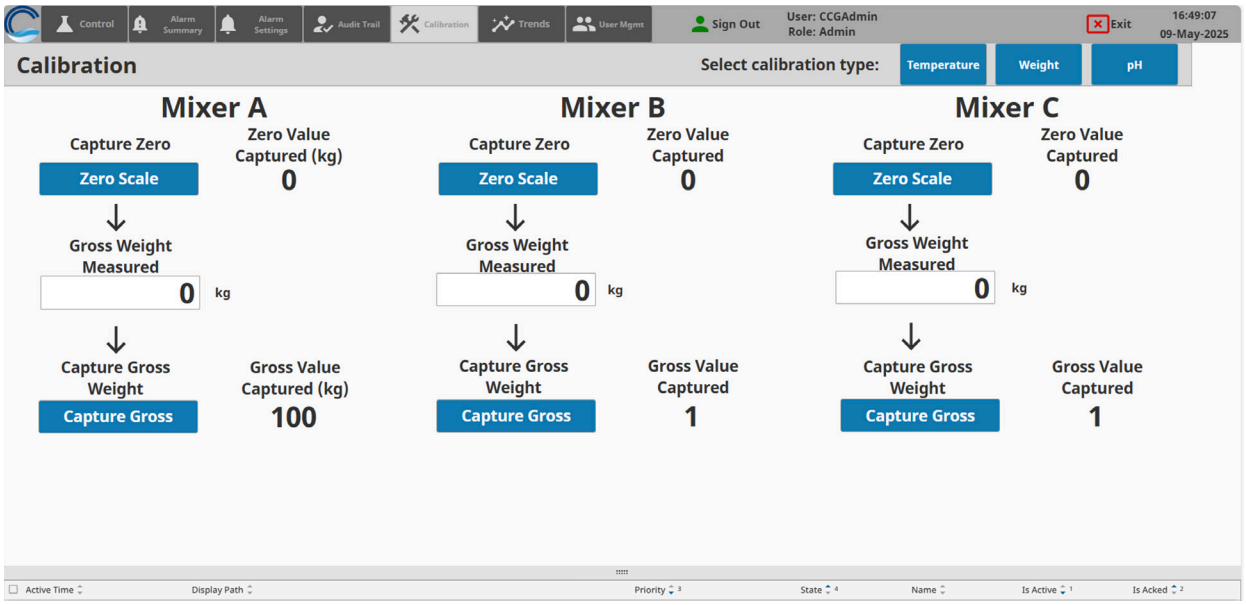
- **Temperature Calibration:** See calibration procedures



- **pH Calibration:** See calibration procedures

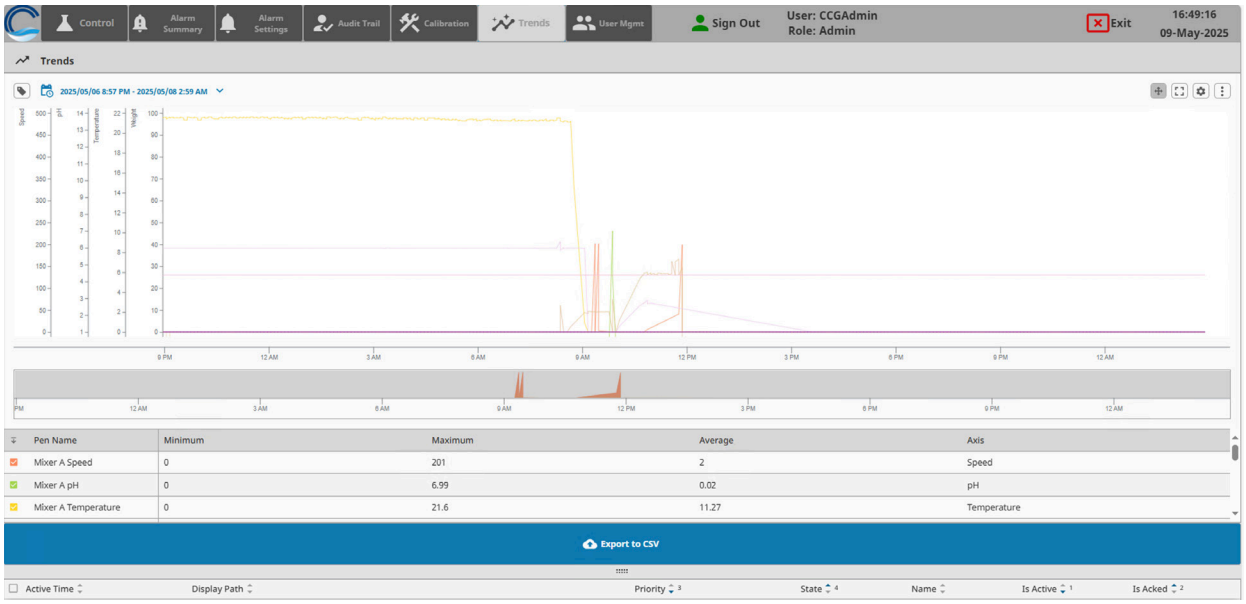


- **Weight Calibration:** See calibration procedures



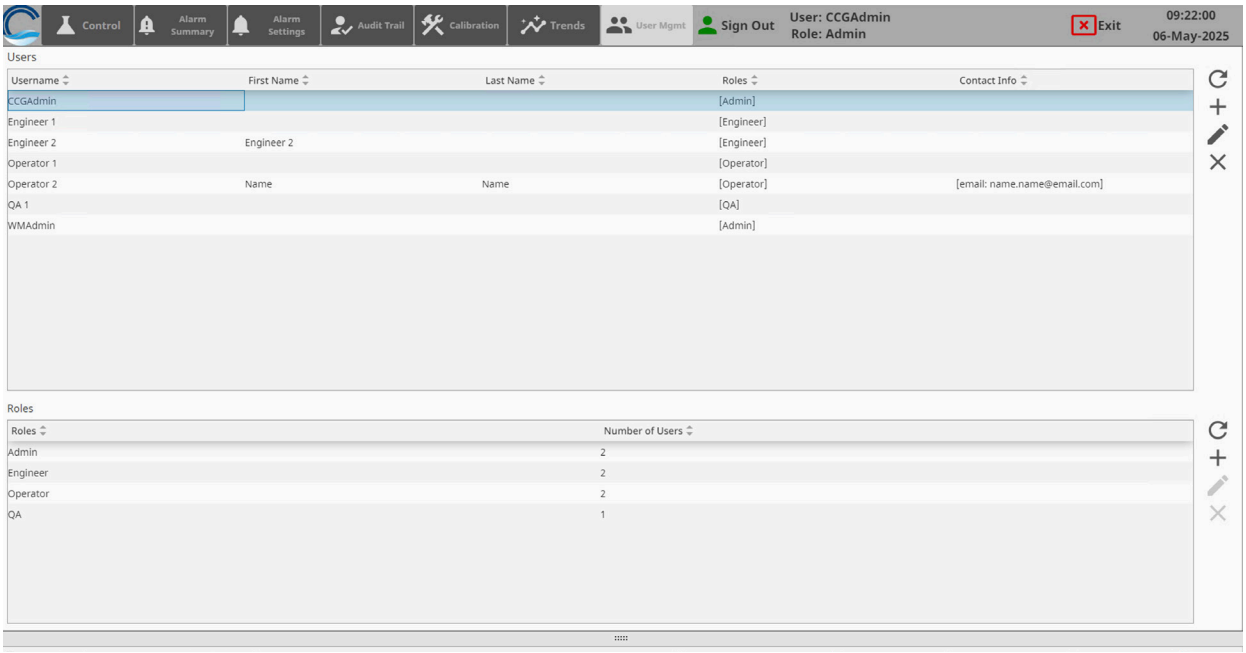
6.9 Trends

- **Trends:** View trended process variables (agitator speed, weight, pH, temperature).



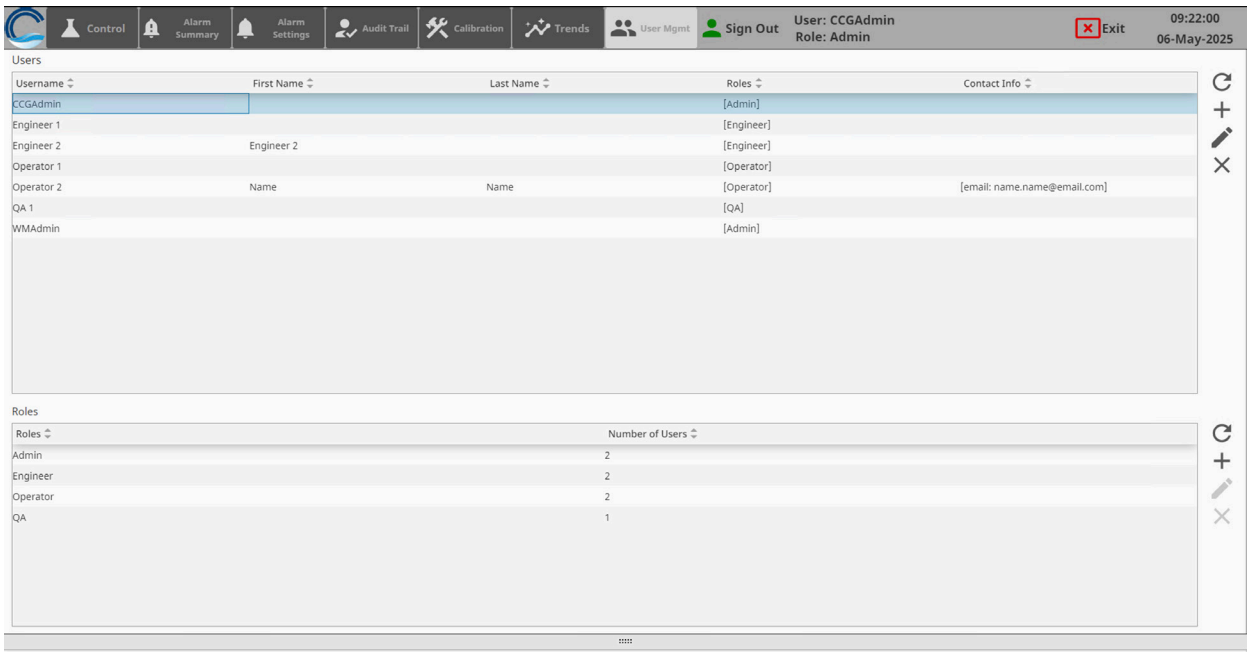
6.10 User Management

- **User Management:** Create / Edit / Delete users and manage User Roles



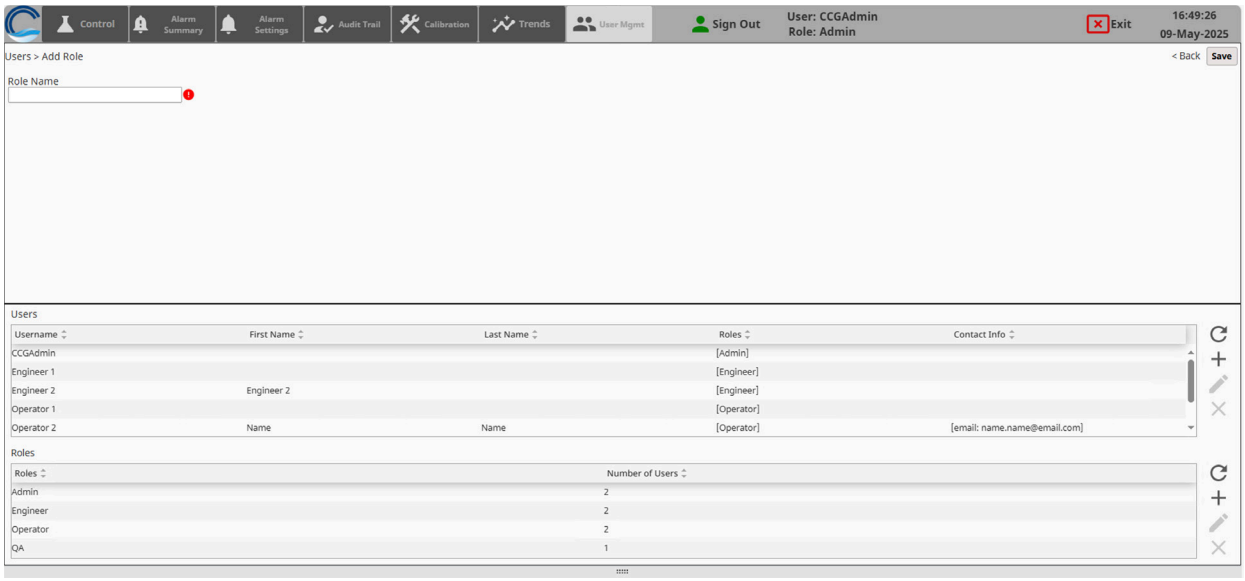
- **Create User:** Click + icon to create a new user. Enter a username and valid password, then click Save.

- **Edit User:** Select user and click pencil icon to modify User details.



- **Delete User:** Click Trash Bin icon to delete a selected user.

- **Roles:** Permissions are set by user roles. A user role may be added by selecting the + icon.



7. CALIBRATION PROCEDURES

7.1 Weighing Calibration

1. Remove all items from Base
2. Zero Scale
3. Place calibration standard weights on Base
4. Enter total weight of calibration standards
5. Click Capture Gross

7.2 pH Calibration

1. Place probe in low-pH buffer solution calibration standard
2. Enter calibration standard pH value in low pH and click Low pH Capture
3. Place probe in high-pH buffer solution calibration standard
4. Enter calibration standard pH value in high pH and click High pH Capture

7.3 Temperature Calibration

1. Place probe in calibration standard.
2. Once equilibrated at steady state, enter an offset value such that temperature matches calibration standard temperature
3. Temperature Offset Displayed

8. SETTINGS

8.1 General Settings

Equipment Number:

- The unique identifier for this unit.

Operating System:

- Windows 10

SCADA:

- Ignition 8.1.45

Database:

- SQL Server Express 2022

9. MAINTENANCE, TRANSPORTATION & SERVICE

9.1 Unpacking

- Remove the equipment from the packaging and place it on a flat, stable surface.
- Verify that all components and documentation are present.
- Inspect for any damage incurred during transportation.
- If returning the equipment for maintenance, use only CCG-approved packaging.

9.2 Cleaning

- Do not submerge any component in liquids
- Do not spray liquids directly onto the controller or base.
- Wipe all exposed surfaces of Mixing Controller and Mixing Base with cleaning fluids compatible with ABS.
- Wipe all exposed surfaces of Non-jacketed Tote with cleaning fluids compatible with Polypropylene
- Wipe all exposed surfaces of Jacketed Tote with cleaning fluids compatible with SS304.

9.3 Preventive Maintenance

- Perform instrument calibration at suggested intervals.
- Inspect system to ensure it meets operational standards.
- Avoid impacts.
- Unauthorized disassembly violates terms & conditions.
- For repairs or servicing, contact Carolina Components Group.

9.4 After-Sales Service & Support

- Email: support@carolinaflow.com
- Web: Service Request Form
- Retain all technical documentation for future reference.

10. ACCESSORIES & SPARE PARTS

Below is an excerpt of available accessories and spare parts (for additional items, please contact CCG):

PART NUMBER	ITEM	QUANTITY
CCGSUM-BTA-C-PCUS, CCGSUM-BTA-C-PCEU, CCGSUM-BTA-C-PCUK	Power Cable Connector	1
CCGSUM-BTA-C-MTPH	pH Sensor Cable	1
CCGSUM-BTA-C-TP	Temperature Sensor Cable	1
CCGSUM-BTA-C-CB	Mixing Base Cable	1

11. CONTACT INFORMATION

Carolina Components Group
1001 Hill Drive, Durham, NC 27703
Tel: (919) 635 – 8438

Email: support@carolinaflow.com
Web: www.carolinaflow.com

Product information is subject to change without notice. Carolina Components Group reserves the right to final interpretation of the manual.