Binks®

OPERATION MANUAL EN

77-3165-2

Binks

IntelliFlow(TM) RF2+

For additional information or copies of your service manual, please visit us online at:

binks.com/en/library

Or use this QR code with your mobile device:

RF2+

Obey local or municipal regulations for product recycling and disposal.

ABOUT THIS MANUAL

ITS PURPOSE

The purpose of this manual is to help you get the most value from your Binks IntelliFlow(TM) system. It can help you install, operate, maintain, and repair your equipment. It provides information and procedures for routine maintenance and servicing and offers diagnostic and repair procedures to follow when trouble occurs.

ITS CONTENTS

This manual is divided into chapters, each of which is divided into consecutively numbered sections.

Chapters will contain text, images, tables, or a combination of them.

Pages with images will have paragraphs and sentences with callout numbers that refer to their respective images, steps, and parts.

Procedures, once described in the text, are not normally repeated. When it is necessary to refer to another chapter or section, the reference will be given as chapter number, section number, and section title (for example, 07.1. Startup Guide).

Chapters include:

Chapter 02. Table of Contents.

Chapter 03. EU Declaration of Conformity–A mandatory document the manufacturer signs to declare the product complies with the EU requirements.

Chapter 04. Safety–Safety, hazard, and warning rules.

Chapter 05. Getting Started—Overview of the operation devices and HMI touchscreen.

Chapter 06. Configuration—Setup and function configurations to prepare for operation.

Chapter 07. Operation—Operation procedures during a full job run.

Chapter 08. Additional Operations—Additional procedures necessary for added operational functionality.

Chapter 09. Manual Change Summary–The revisions and changes made to this manual.

Chapter 10. Warranty–Your equipment’s warranty.

WHO SHOULD USE THIS GUIDE

This guide is intended for users with different levels of knowledge and experience with this system:

Installers: The person(s) who will locate and install this equipment.

Users: The person(s) who will learn how to operate this equipment.

Servicers: The person(s) who will service and maintain this equipment.

This guide assumes all persons who will install, use, operate, and service this equipment have some knowledge of the product and its operating system.

For information on the installation of this equipment, refer to RF2+ Installation Manual 77-3165-1.

For information on the servicing and repair of this equipment, refer to RF2+ Service Guide 77-3165-3.

For information on accessory kits and spare parts of this equipment, refer to RF2+ Kit Instructions & Spare Parts Manual 77-3165-4.

For programming information of this equipment, refer to RF2+ Programming Manual 77-3165-5.

MANUAL DISCLAIMER

All current and applicable certifications shown in this manual confirm Binks' adherence to the strict standards met to obtain the required regulatory compliances.

This manual was prepared with the most accurate information current at the time of publishing. Binks does not accept responsibility for errors in, or omissions from, the information contained herein.

Please get in touch with your distributor or Binks Customer Service for additional service information and assistance.

RF2+ RELATED MANUALS & PUBLICATIONS	
Part Number	Description
77-3154	Flow Meter Kit
77-3155	Remove Fluid Panel Kit–Barrier and F.O. Transceiver Box
77-3156	Flow Meter Sensor Battery Replacement Kit
77-3157	Flow Sensor Kit
77-3158	240-5203 Remote Color Change Kit for RM2 and RF2 Manual
77-3159	Touchscreen Protector Kit
77-3160	Flush Box Kit
77-3164	Flow Meter Replacement Head Kit
77-3165-1	RF2+ Installation Manual
77-3165-3	RF2+ Service Guide
77-3165-4	RF2+ Kit Instructions and Spare Parts
77-3165-5	RF2+ Programming Manual
LN-9112-00	Weeping MVR Service Guide
LN-9225-00	Weepless Service Guide

02 CONTENTS

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03 DECLARATION OF CONFORMITY

Product Description / Object of Declaration:	**IntelliFlow RF2+**
This Product is designed for use with:	**Solvent & Waterbased Materials**
Suitable for use in hazardous area:	
Protection Level:	**Not Applicable**
Notified Body and/or Nationally Recognized Testing Laboratory details and role:	**TUV SUD America Inc, 141 14th St NW, New Brighton, MN 55112 USA. Nos NC721005768.1, NC721003844.1, Cert No. U8 113140 0001 IEC Cert No. DE 3 - 32523**
	Low Voltage and EMC Assessment
This Declaration of Conformity / Incorporation is issued under the sole responsibility of the manufacturer:	**Binks US LLC. 3760 Victoria St N Shoreview, MN 55126. USA**
Representative authorised to compile the technical file	**President @. Binks France SAS 5 Place Pierre Semard, 94130 Nogent sur Marne , Paris, Franc**

EU Declaration of Conformity

CE

This Declaration of Conformity / Incorporation is issued under the sole responsibility of the manufacturer:

Machinery Directive 2006/42/EC
EMC Directive 2014/30/EU
Low Voltage Directive 2014/35/EU
RoHS Directive 2011/65/EU
by complying with the following statutory documents and harmonised standards:
EN 60204-1:2018 Safety of Machinery. Electrical equipment of machines
BS EN 61000-3-2:2014 Electromagnetic compatibility (EMC) - Limits - Limits for harmonic current emissions
BS EN 61000-3-3:2013 Electromagnetic compatibility (EMC) - Limits - Limitation for voltage changes, voltage fluctuations, and flicker in public low-voltage supply systems
EN 61000-6-2:2005/AC:2005 Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity for industrial environments
EN 61000-6-4:2007/A1:2011 Electromagnetic compatibility (EMC) - Part 6-4: Generic standards - Emission standard for industrial environments.
UL 61010-1:2012 Ed.3+R:2019/CSA C22.2#61010-1-12:2012 Ed.3+U1;U2;A1 Electrical Equipment for Measurement, Control, and Laboratory Use; Part 1: General Requirements
KS C 9610-6-2:2019 EMC Immunity Testing of Industrial Environments
KS C 9610-6-4:2017 EMC Emission Testing of Industrial Environments
EN 63000: 2018 Technical documentation for the assessment according to REACH
IEC 61010-1:2010+AMD1:2016 Safety requirements for electrical equipment for measurement, control, and laboratory use. General requirements.
IEC 61010-2-051:2018 Safety requirements for electrical equipment for measurement, control and laboratory use. Particular requirements for laboratory equipment for mixing and stirring
FCC 47 CFR Part 15-Radio Frequency Devices, Subpart B – Unintentional Radiators
ICES-001, Issue 5:2020 Class A Industrial, Scientific, and Medical (ISM) Equipment

Providing all conditions of safe use / installation stated within the product manuals have been complied with and also installed in accordance with any applicable local codes of practice.

Signed for and on behalf of Binks US LLC:	F. A. Sutter	Executive President: Engineering and Operations, Shoreview, MN, 55126. USA
Document Part No. EN	15-4-25	

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04 SAFETY

04.1 SAFETY PRECAUTIONS

Before the operation, maintenance, or servicing of this Binks system; fully read and understand all technical and safety literature for your product. This manual contains information that is important for you to know and understand.

This information relates to USER SAFETY and the PREVENTION OF EQUIPMENT PROBLEMS.

To help you understand this information, we use recognizable ANSI Z535 and ISO warning boxes and symbols throughout this manual. Please obey these safety sections.

⚠ DANGER

DANGER!: Indicates a hazardous situation that, if not avoided, will result in death or severe injury.

⚠ WARNING

WARNING!: Indicates a hazardous situation that, if not avoided, could result in death or severe injury.

⚠ CAUTION

Caution!: Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury, or equipment damage.

NOTICE

Notice: Indicates information considered important but not hazard related.

SAFETY

Safety: Indicates a type of safety instruction, or a separate panel on a safety placard, where specific safety-related instructions or procedures are described.

Careful study and continued use of this manual will provide a better understanding of the equipment functions and procedures.

This understanding will result in improved operation, efficiency, and longer, trouble-free service with faster and easier troubleshooting. If you need the necessary safety literature for your specific system, contact your local Binks representative or Binks directly.

NOTICE

This manual lists standard specifications and service procedures. Differences can occur between this literature and your equipment.

Differences in local or municipal codes, manufacturer or plant requirements, material delivery requirements, and more can make variations unpreventable. To find these differences, compare this manual to your system installation drawings and other applicable Binks equipment manuals.

⚠ WARNING

The user MUST read and be familiar with the Safety Section in this manual and the safety literature therein identified.

Only trained personnel can operate this equipment.

All personnel who operate, clean, or maintain this equipment MUST fully read and understand this manual! To operate and service the equipment, follow all WARNINGS and safety requirements.

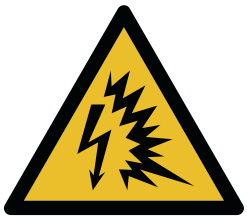
The user must be aware of and adhere to ALL local building and fire codes and ordinances, as well as NFPA 33 AND EN 16985 SAFETY STANDARDS, LATEST EDITION, or applicable country safety standards, before the installation, operation, or servicing of this equipment.

⚠ WARNING

The hazards shown on the pages that follow can occur during the normal use of this Binks equipment, but not all listed hazards will be applicable to your product model or equipment.

Repairs may only be performed by personnel authorized by Binks.

AREAS Indicate possible hazard occurrences.	**HAZARDS** Indicate possible hazards.	**SAFEGUARDS** Prevention of possible hazards.
Spray Areas  	**Fire Hazards** Improper or unsatisfactory operation and maintenance procedures will cause a fire hazard. If the safety interlocks are disabled during operation, protection against accidental arcing is shut off and can cause a fire or explosion. Frequent Power Supply or Controller shutdown identifies a problem in the system. For this occurrence, a correction will be necessary	Fire extinguishing equipment must be present in the spray area. Periodically run a test to make sure the equipment stays usable. Keep spray areas clean to prevent the build-up of combustible residues. Do not smoke in the spray area. The high voltage supplied to the atomizer must be turned off before the equipment is cleaned, flushed or maintained. Spray booth ventilation must be kept at the rates as set by NFPA-33, OSHA, country, local, and municipal codes. If flammable or combustible solvents are used to clean the equipment, ventilate the area. Prevent electrostatic arcing. Maintain spark-safe work distance between the parts that get coated and the applicator. A span of one inch for every 10KV of the output voltage is necessary. Do an equipment test only in areas free of combustible material. The test may necessitate the high voltage to be on, but only as instructed. Non-factory replacement parts or unauthorized equipment modifications can cause a fire or injury. The key switch bypass is used only during setup operation. Do no production work with disabled safety interlocks. Set up and operate the paint procedure and equipment under NFPA-33, NEC, OSHA, local, municipal, country, and European Health and Safety Norms.

AREAS Indicate possible hazard occurrences.	**HAZARDS** Indicate possible hazards.	**SAFEGUARDS** Prevention of possible hazards.
Spray Areas  	**Explosion Hazard** Improper or unsatisfactory operation and maintenance procedures will cause a fire or explosion hazard. If the safety interlocks are disabled during operation, protection against accidental arcing is shut off and can cause a fire or explosion. Frequent Power Supply or Controller shutdown identifies a problem in the system. For this occurrence, a correction will be necessary.	Prevent electrostatic arcing. Maintain spark-safe work distance between the parts that get coated and the applicator. A span of one inch for every 10KV of output voltage is necessary. Unless specifically approved for use in hazardous locations, put all electrical equipment outside of Class I or II, Division 1 or 2 hazardous areas in accordance with NFPA-33, or outside of Zone 2 or Zone 22 in accordance with EN standards. If equipped, set the current overload sensitivity as described in the related section of the equipment manual. If incorrectly set, the current overload sensitivity for protection against accidental arcing is turned off and can cause a fire or explosion. Frequent power supply shutdown indicates a problem in the system, which requires correction. Always turn off the control panel power before the system is flushed, cleaned, or servicing the spray system equipment. Make sure no objects are within the spark-safe work distance before the high voltage is turned on. The control panel must interlock with the ventilation system and conveyor in accordance with NFPA-33, EN 50176. Fire extinguishing equipment must be present in the spray area. Periodically run a test to make sure the equipment stays usable. Do an equipment test only in areas free of combustible material.
General Use and Maintenance 	Improper or unsatisfactory operation and maintenance procedures will cause a fire hazard. Personnel must be correctly trained in the operation and maintenance of this equipment.	Train all personnel in accordance with the requirements of NFPA-33, EN 60079-0. Before equipment operation, personnel must read and understand these instructions and safety precautions. Obey appropriate local, municipal, state, and national codes governing ventilation, fire protection, operation maintenance, and housekeeping. Reference OSHA, NFPA-33, EN Norms, and your insurance company requirements.

AREAS Indicate possible hazard occurrences.	HAZARDS Indicate possible hazards.	SAFEGUARDS Prevention of possible hazards.
Spray Area High Voltage Equipment    	**Electrical Discharge** This equipment contains a high-voltage device that can cause an electrostatic induction on ungrounded objects. This electrical charge is capable of igniting coating materials. Insufficient ground will cause a spark hazard. A spark can ignite many coating materials and cause a fire or explosion.	Operators in the spray area and the parts to be sprayed must be sufficiently grounded. All conductive objects inside the spray area must be grounded. Hold the parts that get sprayed on conveyors or hangers that are correctly grounded. The resistance between the parts and the earth-ground must not be more than 1 MΩ. Refer to: NFPA-33. Before the equipment is operated, ground all operators. They cannot wear rubber-soled insulated shoes. Wear ground straps on wrists or legs for sufficient ground contact. Operators must not wear or carry ungrounded metal objects. When used, operators must make complete contact with the applicator handle and electrostatic gun. Use conductive gloves or gloves with the palm section cut out. Operators must wear grounded footwear. **NOTE: REFER TO NFPA-33 OR SPECIFIC COUNTRY SAFETY CODES FOR GUIDANCE TO CORRECTLY GROUND THE OPERATOR.** Except for objects needed for the high-voltage process, all electrically conductive objects in the spray area are to be grounded. Supply a grounded conductive floor in the spray area. Always turn off the applicator voltage before the system is flushed, cleaned, or when servicing the spray system equipment. Unless specifically approved for use in hazardous locations, put all electrical equipment outside of Class I or II, Division 1 or 2 hazardous areas in accordance with NFPA-33, or outside of Zone 2 or Zone 22 in accordance with EN standards. Do not install an applicator into a fluid system if the solvent supply is ungrounded. Do not touch an energized applicator electrode.

AREAS Indicate possible hazard occurrences.	**HAZARDS** Indicate possible hazards.	**SAFEGUARDS** Prevention of possible hazards.
Spray Areas 	**Toxic Fluid or Fumes** Toxic fluids or fumes can cause severe injury or death if splashed in the eyes or on the skin, or if inhaled or swallowed.	Read the Safety Data Sheet (SDS) for instructions to know and understand how to handle the specific hazards of the fluids used, and the effects of long-term exposure. During the spray, clean, or servicing of equipment, or when in the work area, keep the work area fully ventilated. Always wear personal protective equipment (PPE) when in the work area or during equipment operation. Refer to the Personal Protective Equipment warnings in this manual. Store hazardous fluid in approved containers and refer to local, municipal, state, and national codes governing the disposal of hazardous fluids.
Spray Area and Equipment Use 	High-pressure fluid sprayed from the gun, hose fittings, or ruptured/damaged components can pierce the skin. While this injury can appear as cut skin, this is a severe injury that can result in the amputation of the affected area.	Do not point or operate the spray gun at the body part of a person. Do not put your hand or fingers over the gun fluid nozzle or fittings in the hose or Proportioner. Do not try to stop or deflect leaks with your hand, glove, body, or shop rag. Do not “blowback” fluid, as the equipment is not an air spray system. Relieve pressure in the supply hoses, Proportioner, and QuickHeat™ hose before the equipment is inspected, cleaned, or serviced. Use the lowest possible pressure to recirculate, purge, or troubleshoot the equipment. Examine the hoses, couplings, and fittings every day. Service or immediately replace parts that leak, are worn, or are damaged. Replace high-pressure hose sections. They cannot be recoupled or serviced.

AREAS Indicate possible hazard occurrences.	**HAZARDS** Indicate possible hazards.	**SAFEGUARDS** Prevention of possible hazards.
Equipment and Fluids 	**Skin and Clothing Burns** Equipment surfaces and fluids can become very hot during operation.	Do not touch hot fluid or equipment during operation. Do not let clothing touch the equipment during operation or immediately after the equipment is stopped. Let the equipment fully cool before the examination or servicing of the component.
Pressurized Aluminum Parts    	The use of certain solvents and chemicals can cause equipment damage and severe personal injury.	Do not use 1,1,1-trichloroethane, methylene chloride or other halogenated hydrocarbon solvents or fluids that contain such solvents. These solvents can cause a severe chemical reaction and equipment rupture that results in equipment and property damage, serious bodily injury, or death.

AREAS Indicate possible hazard occurrences.	**HAZARDS** Indicate possible hazards.	**SAFEGUARDS** Prevention of possible hazards.
Spray Areas 	**Do Not Touch** The effect of paint flow rates and formulations on the quality of atomization can cause the turbines to rotate at high speeds.	Do not use a rag or gloved hand against the bell edge to stop or slow down a bell during rotation. Do not try to clean the bell edge during rotation.

⚠ CAUTION

Only operate the equipment after you have read this section.

04.2 ADDITIONAL SAFETY INFORMATION

The IntelliFlow has an emergency stop (E-Stop) pushbutton on the main operator panel. During an emergency, all operations for the IntelliFlow will halt when the E-Stop is engaged. The operator must disengage the E-Stop and reset the system to recover from this state.

Observe all local or municipal safety measures and wear approved protective equipment when servicing this equipment. Clean all spilled chemicals and materials and do all work in a clean and organized environment to prevent personal injury and equipment damage.

⚠ DANGER

To prevent injury or electrocution while the system is under power, do not contact, disconnect, or manipulate electrical connections or devices. The main disconnect on the right side of the controller can be locked out. Follow the proper Lockout–Tagout (LOTO) procedures for internal controller electrical work.

Only qualified electrical personnel can perform the work if diagnosis and troubleshooting are not possible during working conditions.

⚠ WARNING

To prevent possible chemical spillage when personnel are not on site, air and fluid supplies for the equipment must be disabled when the equipment idles for an extended period, such as an end-of-day shutdown.

NOTICE

During the initial commission of the equipment and at periodic times throughout equipment life, visually examine all fluid fittings for leaks.

Periodically, it is necessary to visually examine all pieces of this equipment for signs of noticeable degradation due to chemicals or other conditions in the equipment’s environment.

SAFETY

Obey local or municipal regulations that require installed fire suppression for equipment operation.

If the operation of this equipment, sensors, switches, or other ancillary equipment occurs in the presence of flammable gases and vapors, connect this equipment through intrinsic-safe or Zener barriers. Classify them as a "simple apparatus" or approve them for use in these areas.

05 GETTING STARTED

05.1 OVERVIEW OF OPERATING DEVICES

The controller enclosure at the top of the machine contains the primary devices that the operator will use during operation.

⚠ WARNING

The machine uses high voltage. Servicing must be done only by qualified personnel to prevent accidental electrocution injury or equipment component damage.

05.2 HMI TOUCHSCREEN

The human machine interface (HMI) touchscreen (1) is used as an operator control panel for the machine.

The software-based touchscreen replaces manual controls with software parameters so that operators can easily adapt and adjust the functions.

The touchscreen buttons are graphical representations of the physical devices that control the machine's processes. They let operators adjust and interact with control processes without the use of external tools, including starting and stopping the machine and adjusting set points and output states (which valves are activated and fluid components).

The touchscreen runs on modern operating systems and can perform functions and control tasks across distributed and potentially complex processes from a centralized location.

Most of the IntelliFlow system operation information found in the manuals is available directly through the touchscreen.

05.3 EMERGENCY STOP (E-STOP) BUTTON

The IntelliFlow panel incorporates an emergency stop (E-Stop) button (1) on the front panel, along with an additional unused set of normally open and normally closed contacts, for customer use to interlock other system functions.

When the E-Stop button is pressed, all current machine operations immediately stop. Pressing the E-Stop button does not completely power off the machine but ceases the current operation. All analog and control outputs to the fluid system are removed, and the fluid flow will immediately stop for all channels.

After correcting the issue that caused the work stoppage, reset the safety relay by pressing the reset button on the HMI. This resumes machine operation.

05.4 STACK LIGHT

The stack light (2) visually communicates the status or operation errors of the machine to the operator or personnel on the operating floor.

The stack light illuminates in different colors that tell the operator the general status of the machine at any given time during operation. Refer to the table below to understand what the illuminated colors represent.

LIGHT	FUNCTION
Green—Solid	Machine is in "RUN" state, and no trigger signal is present on any stations.
Green—Flashing	Machine is in "RUN" state, and trigger signal is present on one or more stations.
Red—Solid	Machine fault is present.
Yellow—Solid	Warning indication. No fault is currently present.
White—Solid	Machine stopped and in idle state. No system warnings or faults.

05.5 MAIN DISCONNECT SWITCH

The main disconnect switch (1) controls machine power. Turning the switch off disconnects the main control panel and power source. The switch energizes for operation and de-energizes for shut-down or during maintenance. The disconnect switch features a padlock loop for Lockout-Tagout (LOTO) procedures.

When operators initially power-on the IntelliFlow system, the system will automatically start the boot process. This can take up to one minute to complete. When the system is ready to operate, the stack light will turn white.

05.6 TOUCHSCREEN SPLASH SCREEN

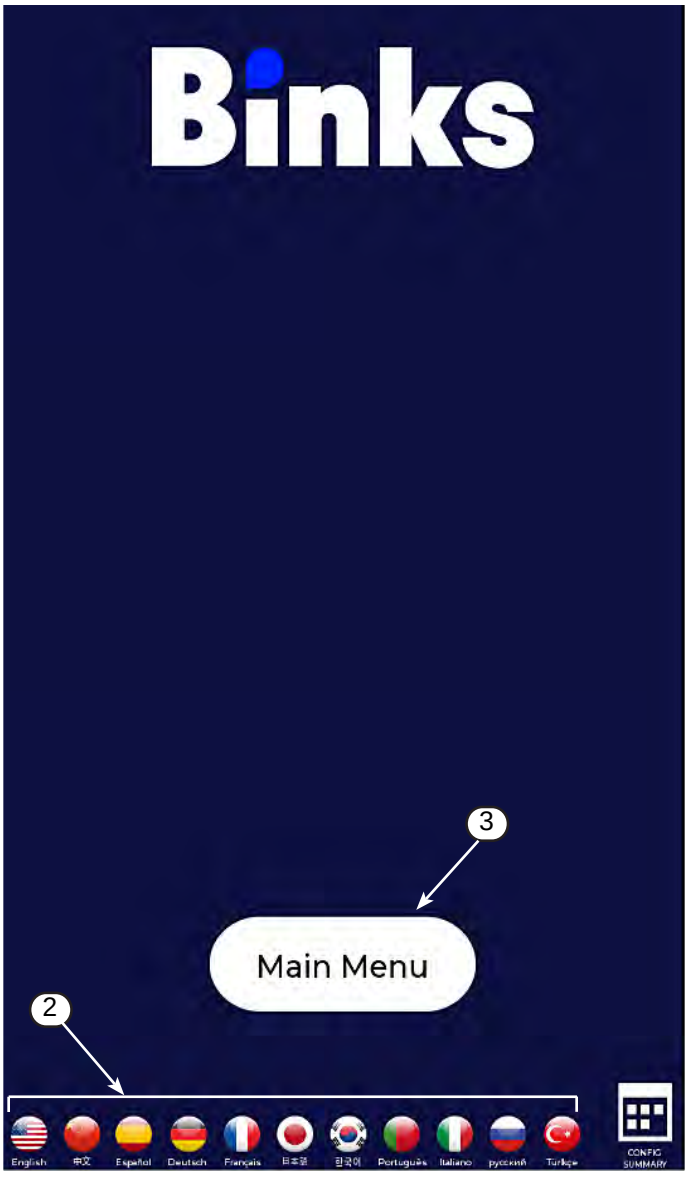
The touchscreen splash screen is the first screen the system loads and appears every time the machine is powered on. It is only visible while the machine loads for operation.

The machine ships to all customers with the default language set to English. To change languages, click on the country icon (2) at the bottom of the splash screen that represents the operator's language.

The machine boots up with the language last used before shutdown, so operators will not need to select their preferred language each time they turn on the machine.

Operators can also select languages in the application interface at any time during machine operation.

Select **Main Menu** (3) to navigate to the main screen.



05.7 NAVIGATION

The main run screen is the primary screen for all machine operations. From this screen, the operator can start and stop operations, load materials, and flush the system.

The screen also allows access to all system settings and configurations. At the start of a job, the machine can be configured for the operator. Refer to 06. Configuration for configuration options.

MENU (1) opens a drop-down menu that allows access to system functions unavailable in the main screen.

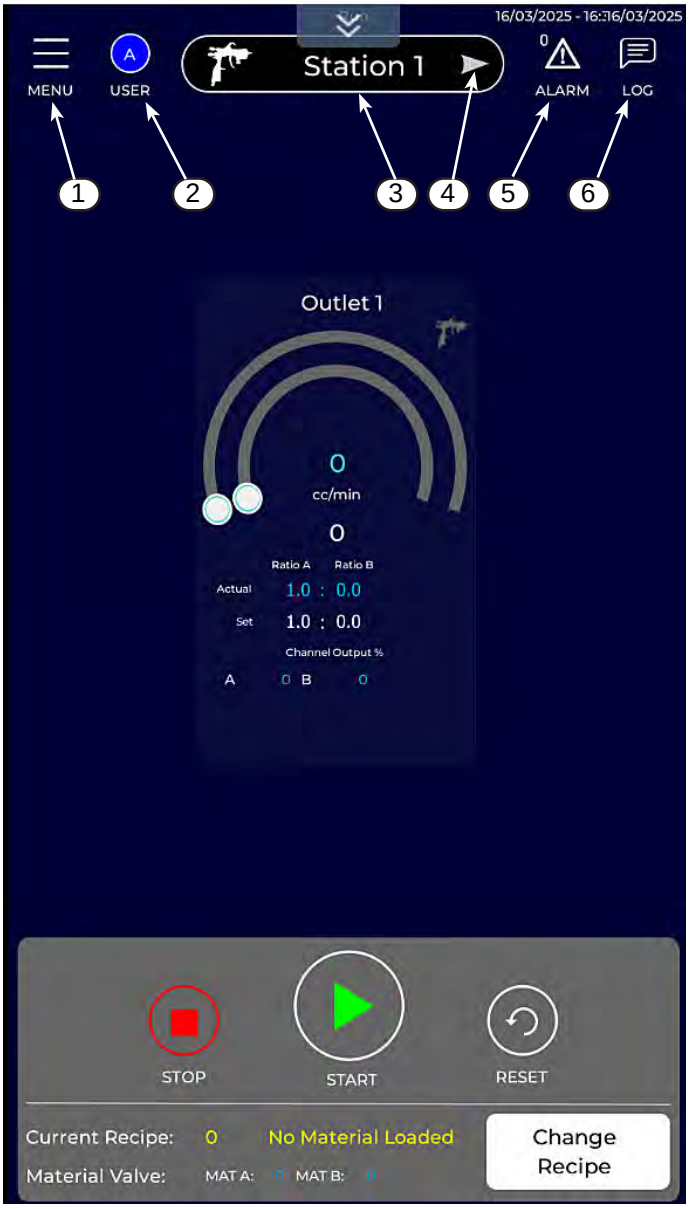
USER (2) opens a screen for the operator to log in and log out.

The station indicator button (3) shows which station is currently displayed on the main screen. If more than one station is configured, navigation arrows (4) will appear next to the station indicator button. Select an arrow to display the desired station on the main screen.

On screens with no station selection, this field will have a gray background and a fixed description.

ALARM (5) opens the alarm status and history screen. When alarms are present, the alarm icon turns red. The number of active alarms is displayed in the upper left of the icon.

LOG (6) opens the event log screen.

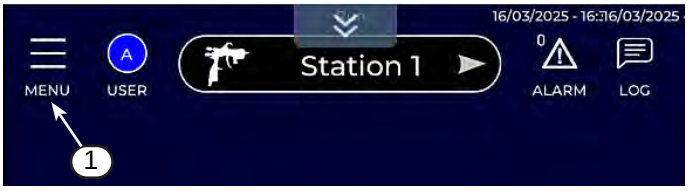


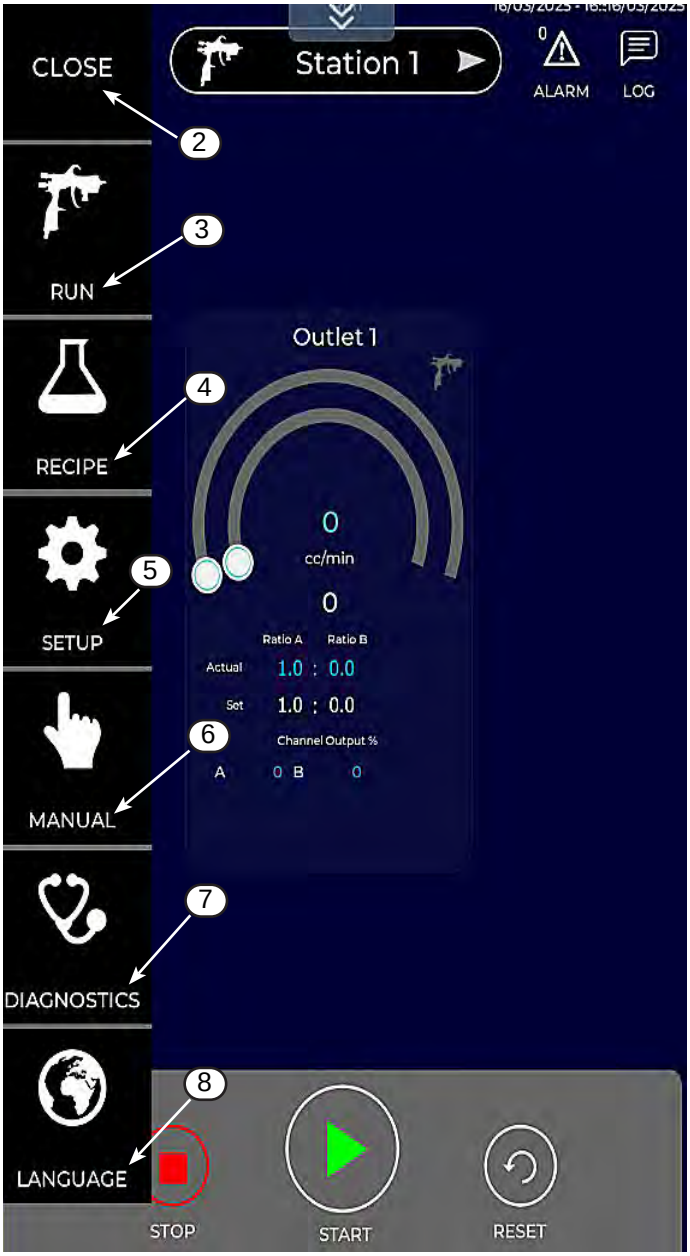
05.8 DROP-DOWN MENU

Use the drop-down and fly-out menus on the touchscreen to navigate to different functions, settings, and adjustments. Administrators can limit access to specific functions to designated users.

To access the main drop-down menu, select **MENU** (1) at the top of the touchscreen. The drop-down menu includes the following functions:

- **CLOSE** (2) closes the drop-down menu.
- **RUN** (3) opens the main run screen.
- **RECIPE** (4) opens the recipe edit screen.
- **SETUP** (5) opens the main setup screen that gives access to all global configurations.
- **MANUAL** (6) opens the manual/local control screen.
- **DIAGNOSTICS** (7) opens the diagnostic screen.
- **LANGUAGE** (8) opens the language menu. Use this menu to select the operator's language.





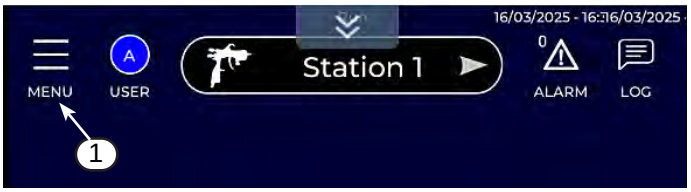
05.9 LANGUAGES

The touchscreen displays a defined number of available languages so users can operate the system in their native language.

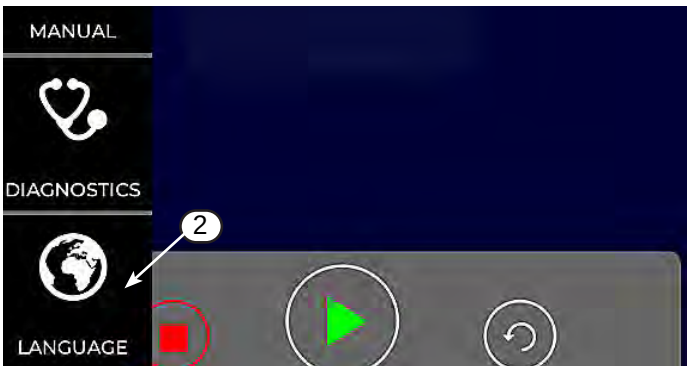
NOTICE

Regardless of the operator-selected language, not all objects can be translated during run time. Some of these include the user-defined fields of station, gun, channel, output names, and some of the internal screens.

1. To select a language, click on **MENU** (1) at the top of the screen. This opens the main drop-down menu.



2. Press **LANGUAGE** (2) on the main drop-down menu. This button is illustrated with a globe icon.



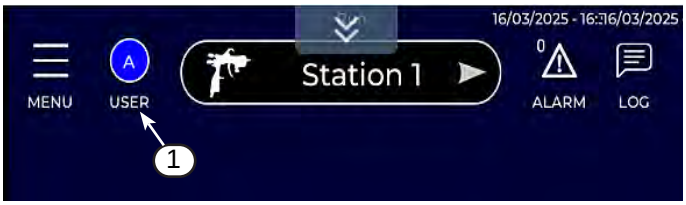
3. A language selection menu (3) will open with representative language icons.
4. Press the desired language icon to change the language on the interface screens. Languages include:
   - English
   - Chinese
   - Spanish
   - German
   - French
   - Japanese
   - Korean
   - Portuguese
   - Italian
   - Russian
   - Turkish

05.10 LOG IN

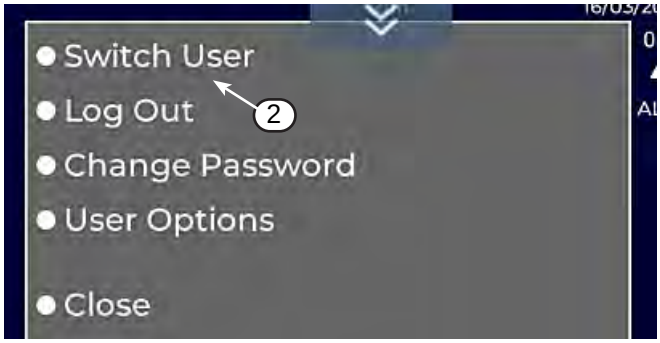
At boot, the system will be logged in as the guest user. Members of the "admin" group can access functions unavailable to the guest user and modify user access via the log in screen. For more information on user options, refer to 06.6. User Management.

To log in:

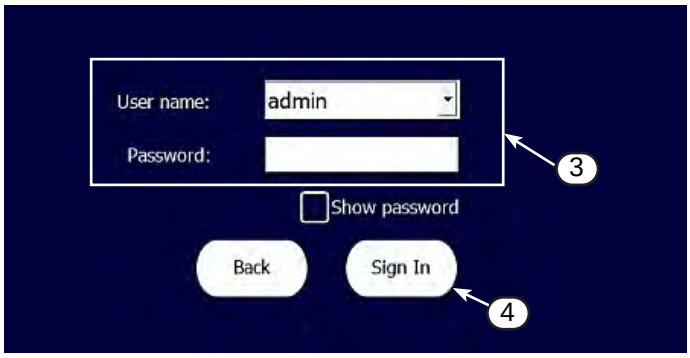
1. Select **USER** (1) from the navigation bar.



2. Select **Switch User** (2) from the drop-down menu.



3. Enter the user information into the login input fields (3), including:
   - User name
   - Password
   - Show or hide the password
4. After filling the user input fields, press **Sign In** (4).



NOTICE

The RF2+ is programmed at the factory with a default user and password setting. Enter these in all lower case only. The user name and password are both **admin**.

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06 CONFIGURATION

06.1 SYSTEM SETUP

The RF2+ supports multiple configurations of the physical hardware. The flow control processes can also vary greatly depending on the application.

The system must be configured to match the machine's physical hardware and the user process before operation.

To configure the system:

1. Log in as an administrator. For more information on logging in as an administrator, including the user name and password, refer to 05.10 Log In.

NOTICE

Configuration screens are only accessible by a user with administrator credentials.

2. Select **MENU** (1) to open the main drop-down menu.

3. Select **SETUP** (2) from the main drop-down menu.

06.1.1 SETUP MAIN SCREEN

Selecting **EXOR Internal Menu** (1) opens a pop-up screen to the internal settings. Use this screen to modify the Exor operator interface.

Selecting **System Configuration** (2) opens the system configuration screen, where the operator can adjust the system's operation.

Use the buttons under **Fluid System Configuration** (3) to set the fluid system outputs, functions, and overall sequence definitions and parameters.

Select **Config Summary** (4) to open a screen with an overview of the system configuration.

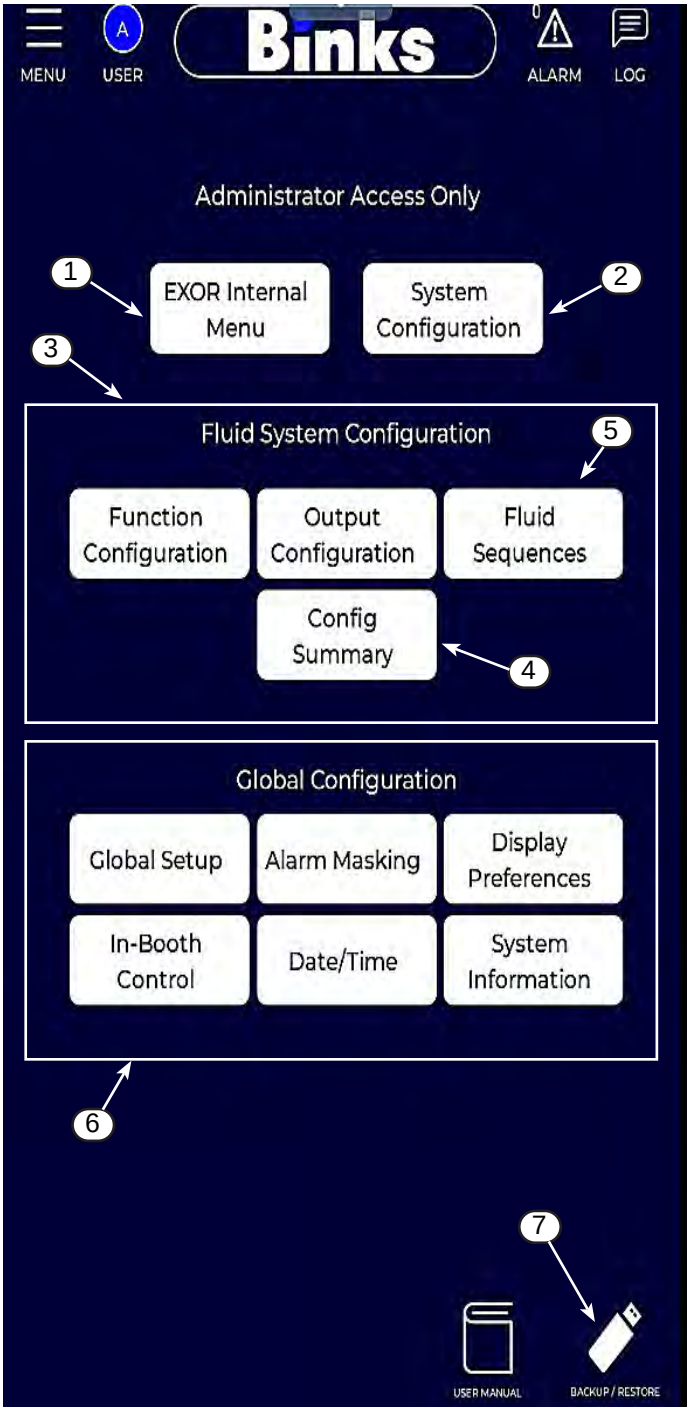
Select **Fluid Sequences** (5) to modify individual fluid sequences, including step timing and order of operations.

Use the buttons under **Global Configuration** (6) to modify several parameters that dictate the system's behavior.

NOTICE

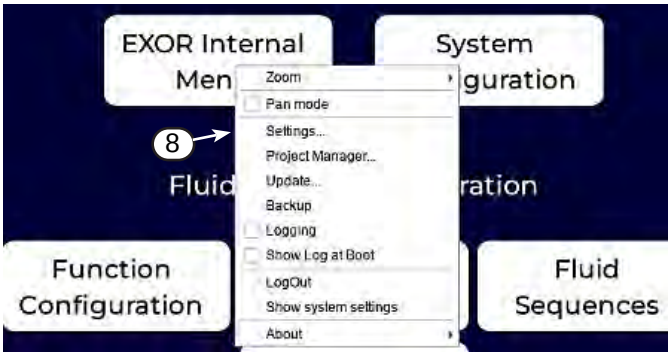
Configuration screens are only accessible by a user with administrator credentials.

Select the backup/restore icon (7) to access the backup and restore screen, where you can save either the entire system configuration or individual parts of it.



06.1.2 EXOR INTERNAL MENU

Select **EXOR Internal Menu** to access the Exor operator interface's internal settings (8). The Exor screen is only required to select the administrative functions covered in later chapters and sections of this manual.



06.2 SYSTEM CONFIGURATION

Use the system configuration screen to define the hardware installed on the RF2+.

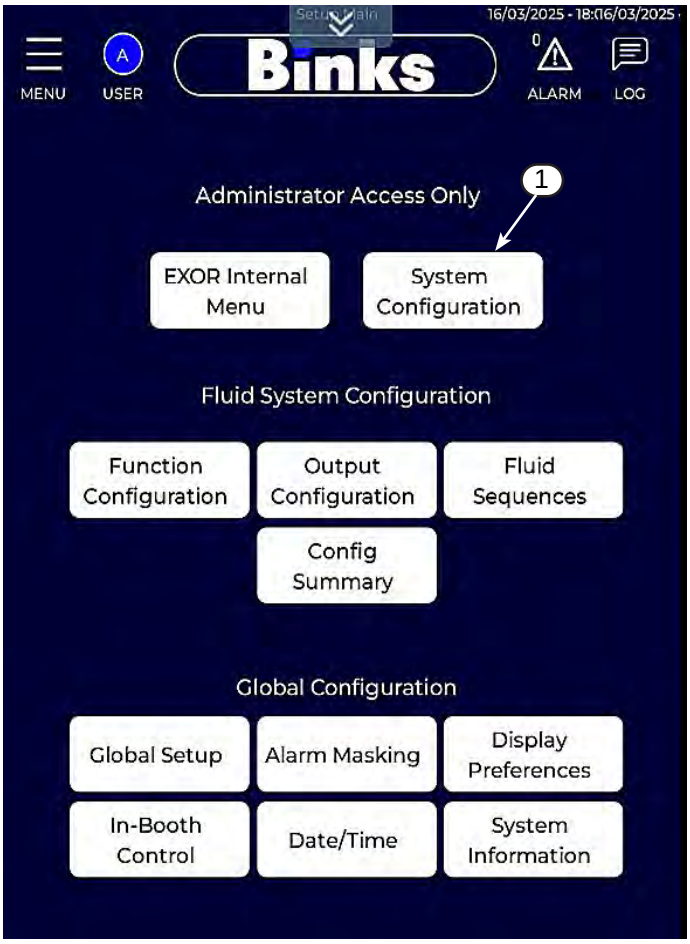
NOTICE

System Configuration will not appear if any station is in run mode. Stop operations to access this option.

To complete system configuration:

1. Select **System Configuration** (1) from the setup main screen.

   Once users start configuring the system, they must complete the process before returning to other parts of the HMI.

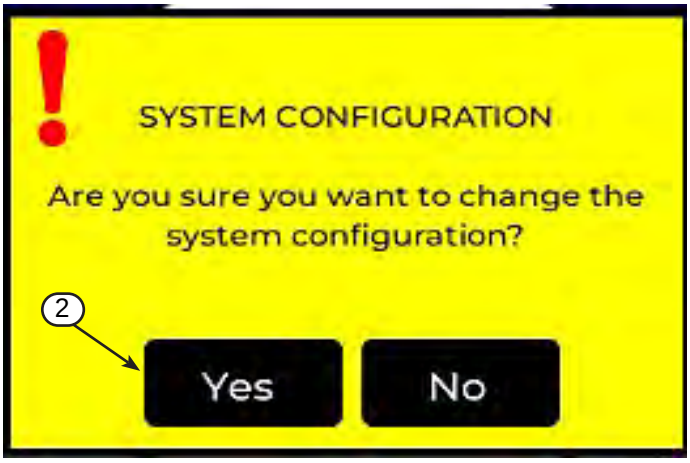


2. A warning screen will appear asking if you want to proceed with system configuration. Select **Yes** (2) to continue.

NOTICE

Once you open **System Configuration**, you must complete the entire process before returning to the setup screen.

3. The system will automatically reboot once all configuration screens have been completed.

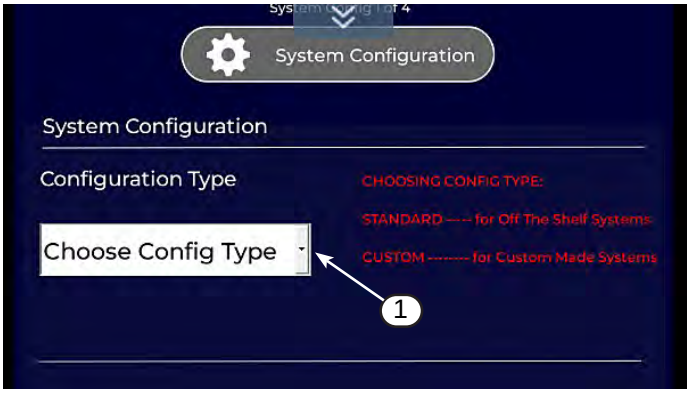


06.2.1 STANDARD CONFIGURATION

Use the first system configuration screen to select the correct RF2+ configuration for your machine. Off-the-shelf systems are considered "standard."

To configure a standard RF2+ machine:

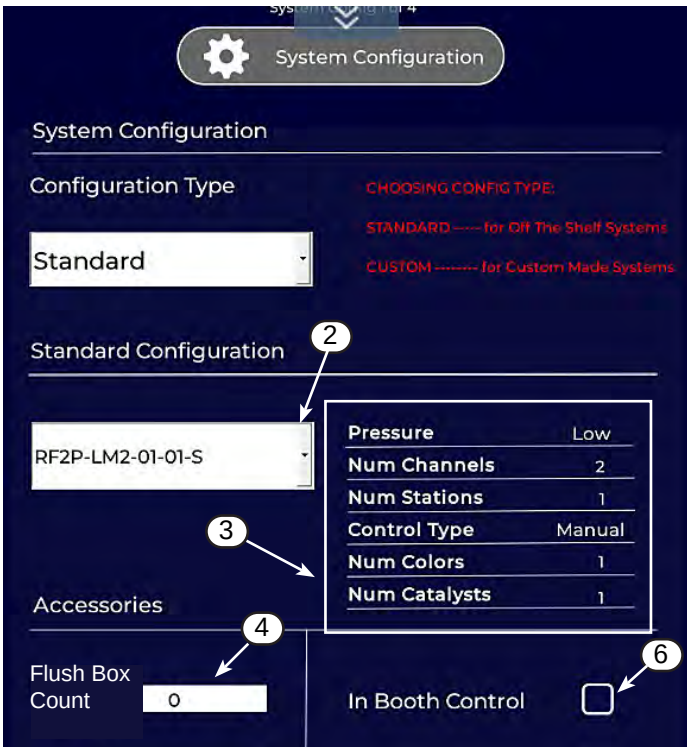
1. Select the arrow next to **Choose Config Type** (1) to open the configuration type drop-down menu.
2. Select **Standard**.

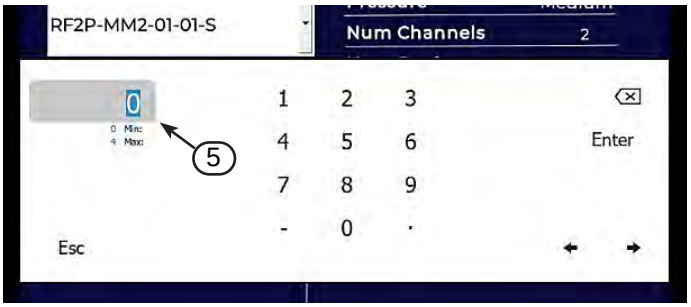


3. Selecting **Standard** reveals a drop-down menu displaying standard configurations (2). The screen will display the following information for each configuration type (3):
   - Pressure
   - Number of channels
   - Number of stations
   - Control type
   - Number of colors
   - Number of catalysts
4. Select the appropriate system. If you have a standard configuration system, the part number will be displayed on the nameplate label. The nameplate label is located on the right side of the enclosure door.
5. Enter accessory information if applicable. Certain standard configurations come with the option for additional flush boxes or in-booth control.
   a. To configure your system for additional flush boxes, select the value box next to **Flush Box Count** (4) and enter a value using the keypad (5)

      The maximum number of flush boxes available on the RF2+ is four.

   b. To configure your system for in-booth control, select the box next to **In Booth Control** (6).
6. Select **Finish** (7) to complete the configuration procedure.



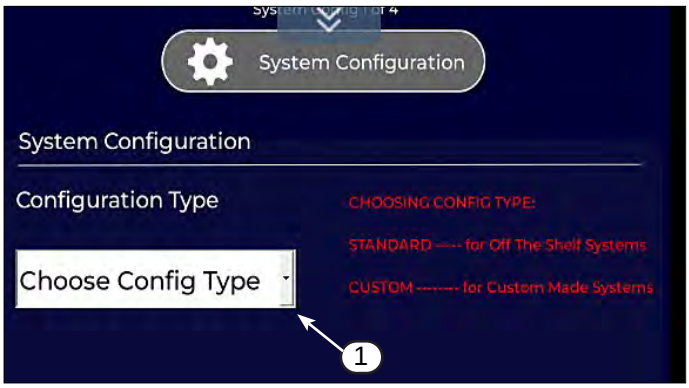


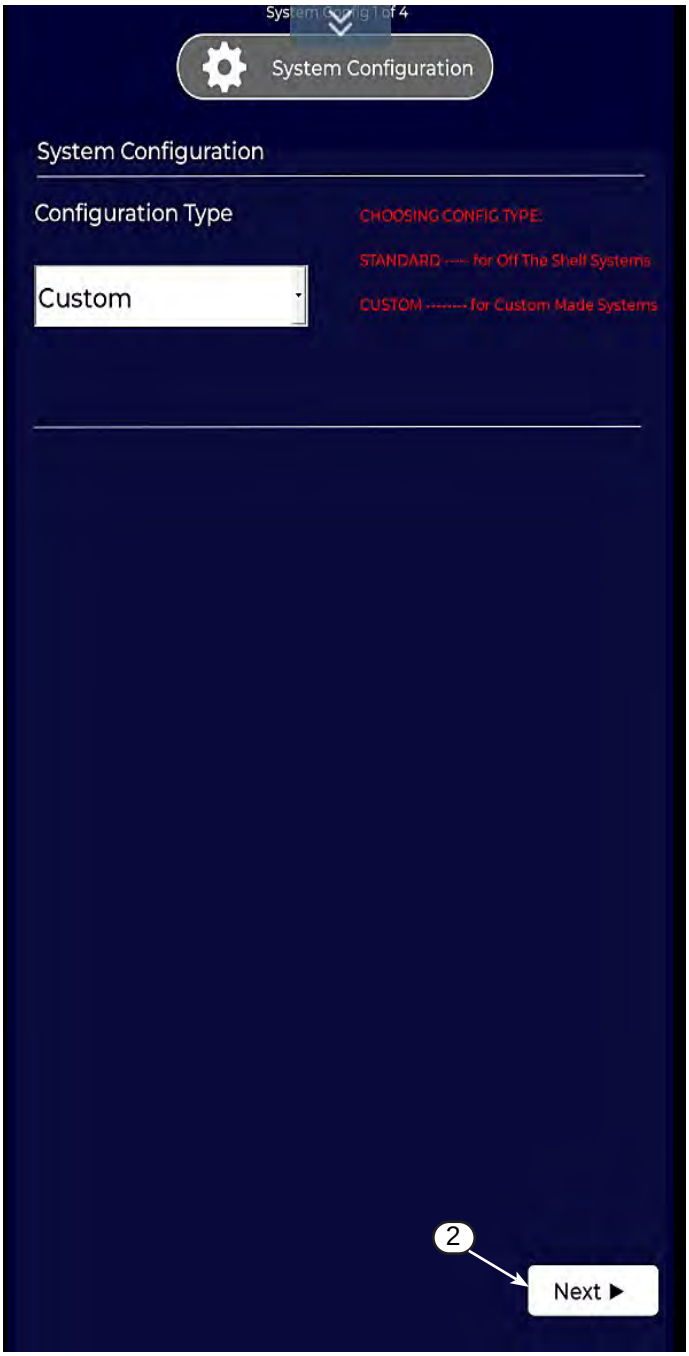
06.2.2 CUSTOM CONFIGURATION

System configuration for a custom-made RF2+ system includes four screens. Users must complete all four screens to finish the process and return to run mode.

Use the first system configuration screen to select the correct RF2+ configuration for your machine.

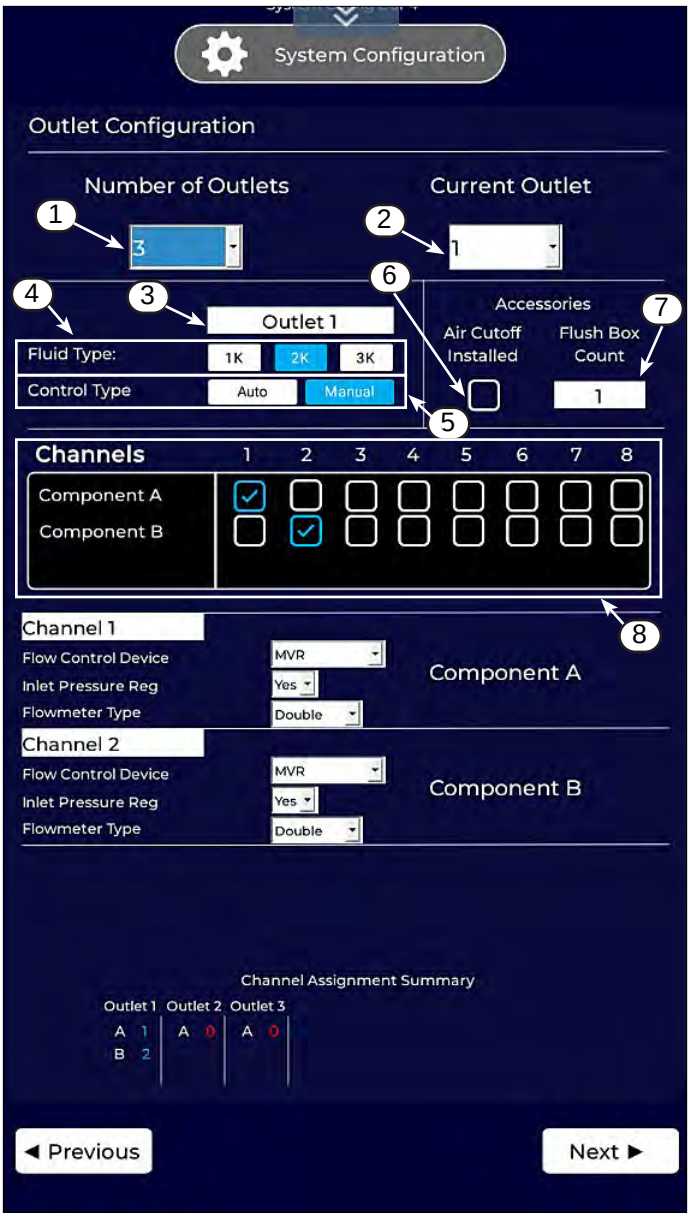
1. Select the arrow next to **Choose Config Type** (1) to open the configuration type drop-down menu.
2. Select **Custom**.





3. Select **Next** (2).

4. The second system configuration screen allows users to configure outlets. Outlets are where mixed material exits the machine. Select the **Number of Outlets** (1) for your system. This determines which outlets are available to configure.



NOTICE

Configure each outlet separately before moving to the next step. The system will not allow you to continue through configuration until each outlet is configured.

5. Configure each outlet.
   a. Select the outlet number in the **Current Outlet** box (2).
   b. Users may choose to rename the outlet (3) to customize the display to their application.
   c. Select the correct **Fluid Type** (4). Choose between 1 component (1K), two component (2K) and three component (3K).
   d. Select the correct **Control Type** (5). The options include either automatic or manual control.
   e. If your system includes air cutoff valves, select the box under **Air Cutoff Installed** (6).
   f. If your system includes spray gun flush box(es), enter the number of boxes in the **Flush Box Count** box (7).

NOTICE

Accessory options are only available for outlets controlled manually and are mutually exclusive. Machines equipped with gun flush boxes will not have air cutoff valves and vice versa.

   g. Select which channels to use for each component (8). The availability of each component depends on fluid type selection. For example, components A, B, and C will be available if the fluid type selection is 3K.

      Channels must be mapped to physical channels 1-8. Users can only select one channel per component. The number of channels available will depend on the hardware installed.

NOTICE

The RF2+ has access to eight channels. A physical channel can only be mapped to one channel of one outlet. When a channel is selected elsewhere, it will automatically deselect in the other location.

h. For each channel, enter the following:

- Each channel can be named (1). This name will be displayed on the main screens as a reference for the channel.
- **Flow Control Device** (2): Select the device that will control the fluid flow rate.

  Choose between **MVR** (material volume regulator), **Pulse** (pulse valve, only available for component B or C), **Feedback Only** (fluid flow is controlled manually, only available for manual systems on component A), and **Dispense Pump** (dispense pump, only available for component B or C).
- **Inlet Pressure Reg** (3): Select if a pressure regulator is used on this channel.

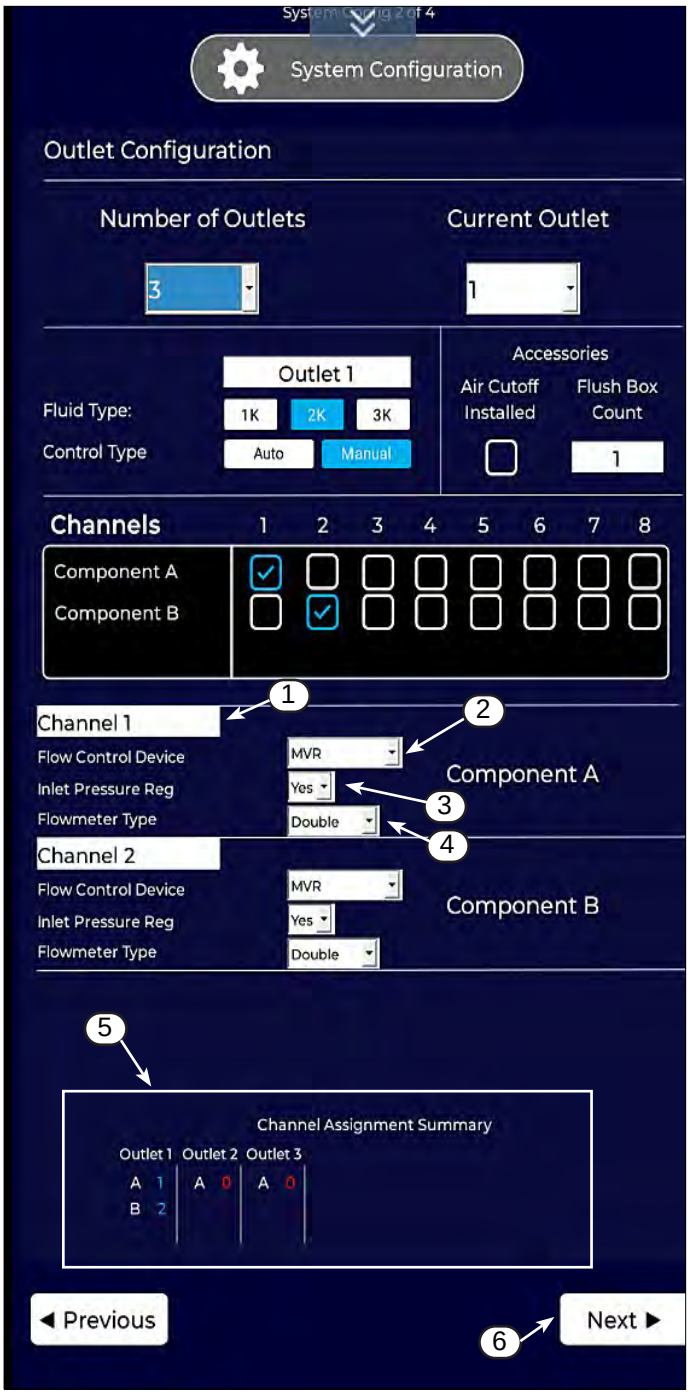
  This field is hidden when the dispense pump option is chosen.
- **Flowmeter Type** (4): Method of feedback for flow control.

  If using a dispense pump, this field is replaced with the option to select either the 300cc or 600cc dispense pump.

6. Review the **Channel Assignment Summary** (5) for channel configurations.

   Items shown in red on the channel assignment summary are incorrect or incomplete. Ensure all items are blue (correct and complete) before continuing.

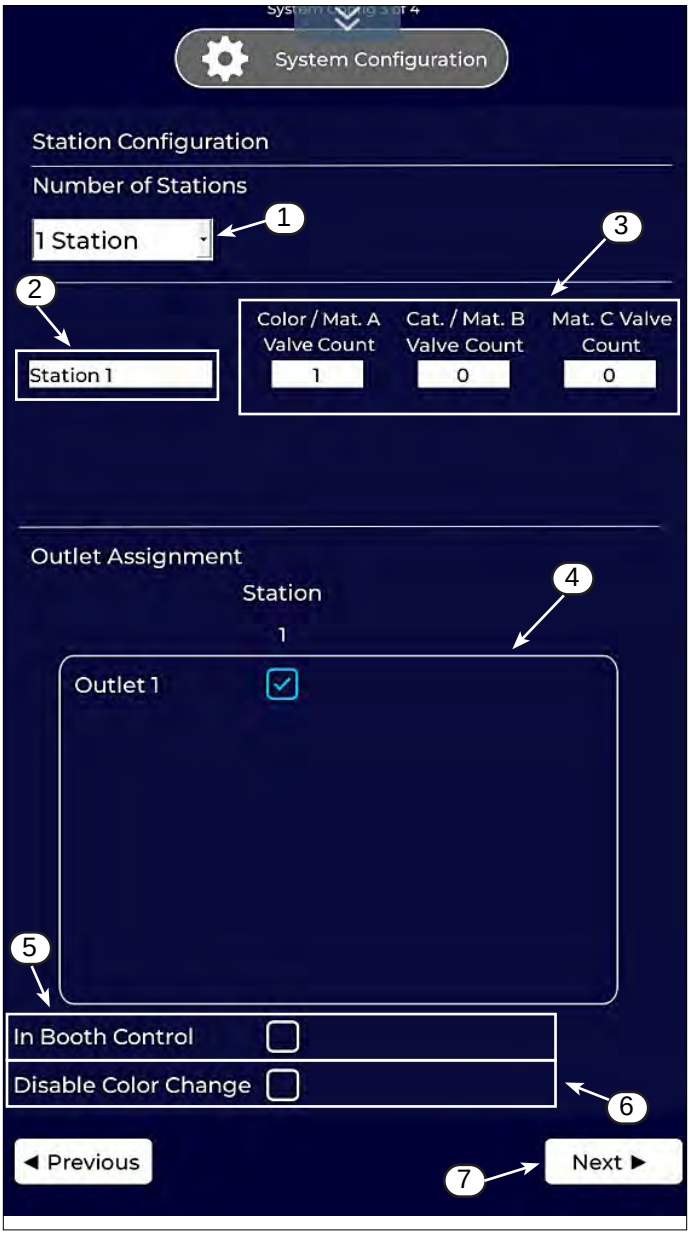
7. Select **Next** (6) to continue to station configuration.



8. The third system configuration screen determines station configuration. To configure the stations:
   a. Select the **Number of Stations** (1) available on your system.
   b. The stations will populate below (2). The station names are what will be used to reference each station throughout the HMI. Users may enter new names in each box if desired.
   c. Enter the number of solenoid valves available for materials in each channel (3).

      The value entered here must match the number of valves that are connected and used. Recipes can then correctly load the materials later.

      If an external system manages color selection, these values should be set to 0 regardless of the number of colors used.



NOTICE

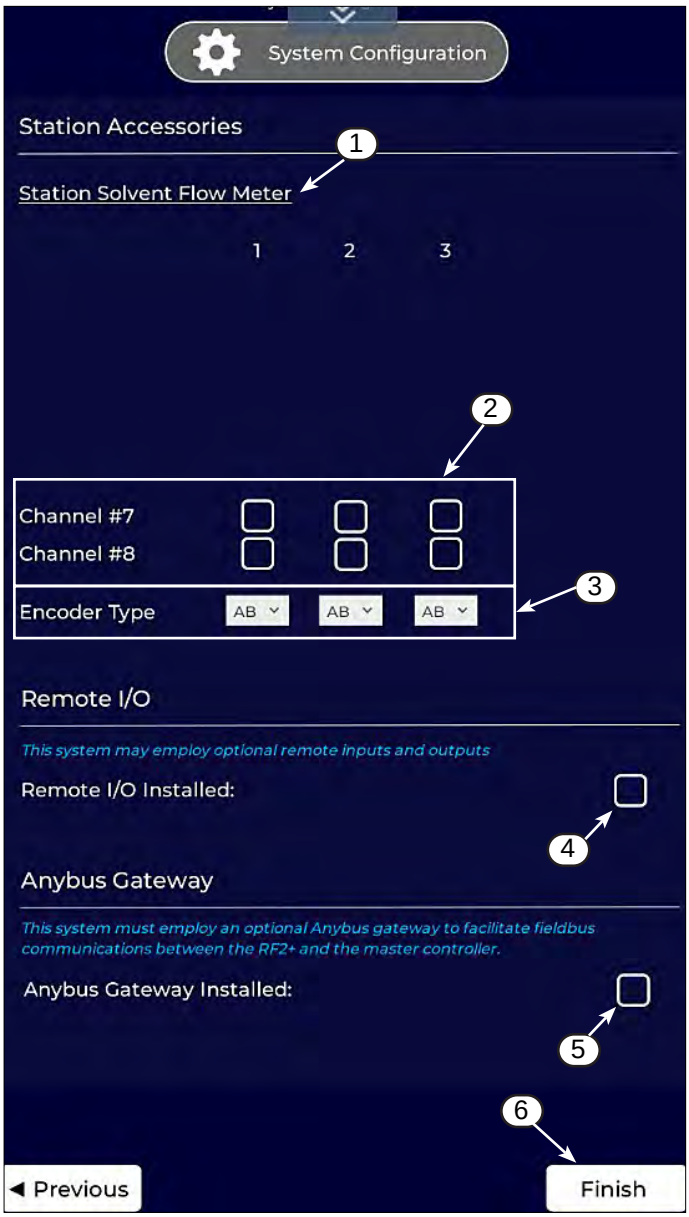
Set the solenoid valves to 0 if an external system manages color selection.

   d. In the **Outlet Assignment** (4) section, select the station for each outlet.
   e. Select **In Booth Control** (5) for each station using in-booth control.
   f. Select **Disable Color Change** (6) for applicable stations. This will deactivate the internal sequences used for loading colors using the recipe function.

      When this option is enabled, the corresponding station will not be able to run sequences or open color change valves. An external system must be used to load colors or flush the system.
   g. Select **Next** (7) to continue to the station accessories configuration screen.

9. The fourth system configuration screen determines station accessories.
   a. **Station Solvent Flow Meters** (1) can be installed to accurately track the amount of solvent used. Any unused channel inputs can be used as a station solvent flow meter.

      Select the desired channels (2) to use as a station solvent flow meter.
   b. Select the **Encoder Type** for each station solvent flow meter (3).
   c. Select the box next to **Remote I/O Installed** (4) if the system is connected to a remote I/O assembly to expand the use of hardwired control signals.
   d. Select the box next to **Anybus Gateway Installed** (5) if the Anybus gateway is used for communications with supervisory processes.
   e. Select **Finish** (6) to complete the system configuration.



NOTICE

The system will reboot and return to the splash screen after **Finish** is pressed.

06.3. FLUID SYSTEM CONFIGURATION

06.3.1 OUTPUT CONFIGURATION

Use the **Output Configuration** (1) screen to define the description, type, and interlocks for each output of the solenoid manifold.

06.3.1.1 DEFAULT CONFIGURATION

The RF2+ can control external air signals, including applicator trigger and dump signals. Every solenoid controlled by the RF2+ is programmable, so the individual port location for any signal depends on the programmed location for that signal.

The standard RF2+ configuration will be programmed from the factory with a list of signals. A list will be provided to show the air connections as programmed. Users can view and modify this list as desired.

NOTICE

The default configuration for custom systems and those purchased as a controller only may not represent your actual hardware.

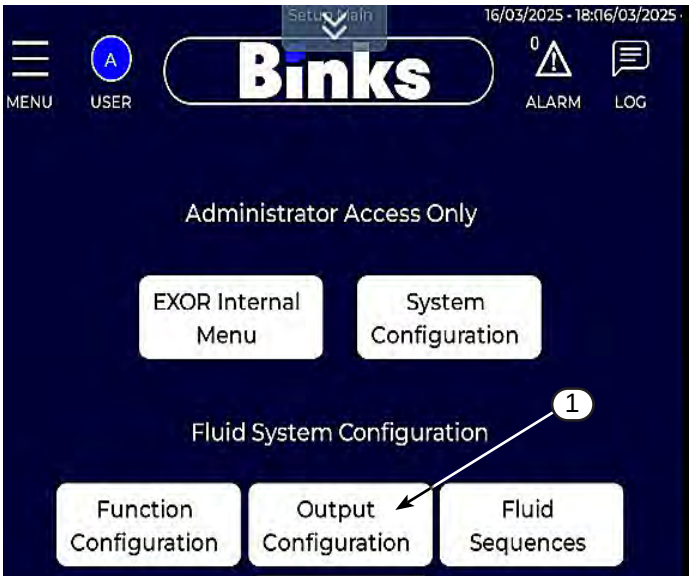
To view the list of connections:

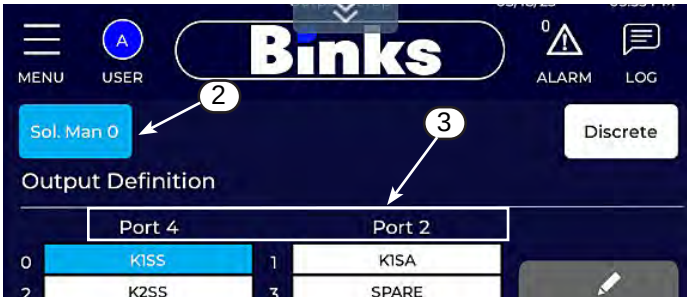
1. Select **Sol. Man 0** (2) on the top of the output configuration screen. Note that the RF2+ can control up to four solenoid manifolds, but in many cases, the system will only be configured for one. Only connected manifolds will be shown.
2. The list of outputs is shown as **Port 4** and **Port 2** (3), with 16 rows representing the possible 16 modules in the selected manifold. Each module has two solenoids. The orientation is the same as the view of the air connections at the base of the solenoid manifold.

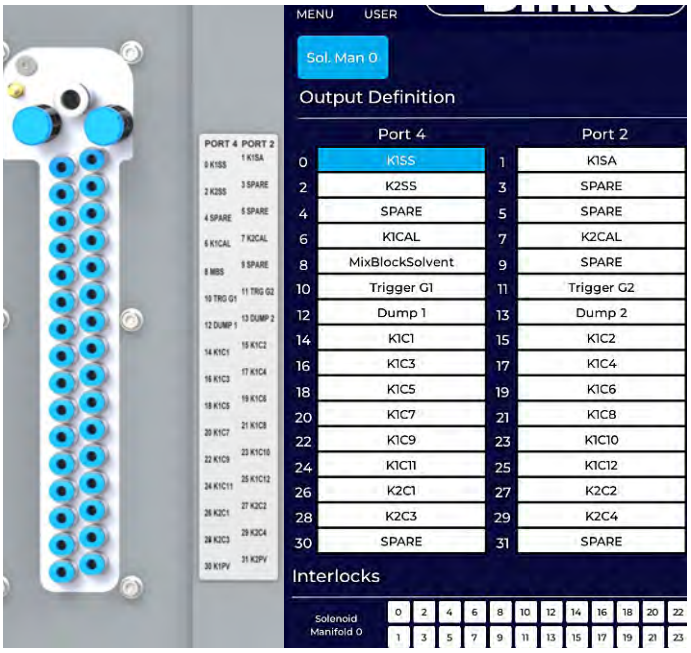
All air signals that control elements that are provided with the RF2+ will be pre-programmed, and their air tubing will be pre-installed. However, their solenoid locations may also be viewed or modified using the same procedure as above.

If a solenoid fails due to wear or other damage, a quick "output swap" process is provided so that any two output configurations and functionality can be swapped.

Normally, the system will be provided with some unused solenoids for this purpose. This function is located in 06.3.1.2 Editing Outputs.







The table below lists examples of output names using color change valve terms.

CCV DEFINITION KEY	EXAMPLES
k = Component	k1cal = Component 1 calibration
# = Channel/component #	k1c3 = Component 1 color 3
ss = Stack solvent	k2c3 = Component 2 color 3
sa = Stack air	k1pv = Component 1 pulse valve
c = Color	
pv = Pulse valve	
cal = Calibration	
mbs = Mix block solvent	

06.3.1.2 EDITING OUTPUTS

The list of solenoids in the manifold (1) updates each time the user selects a new manifold. Each output on the manifold (0-31) can be selected.

Note that the outputs are arranged in two columns (**Port 4** and **Port 2**). Their orientation represents the view of the air connections on the back of the solenoid manifold.

To view individual output details:

1. Select the source of the outputs: either **Sol Man. 0** (1) or **Discrete** (2).

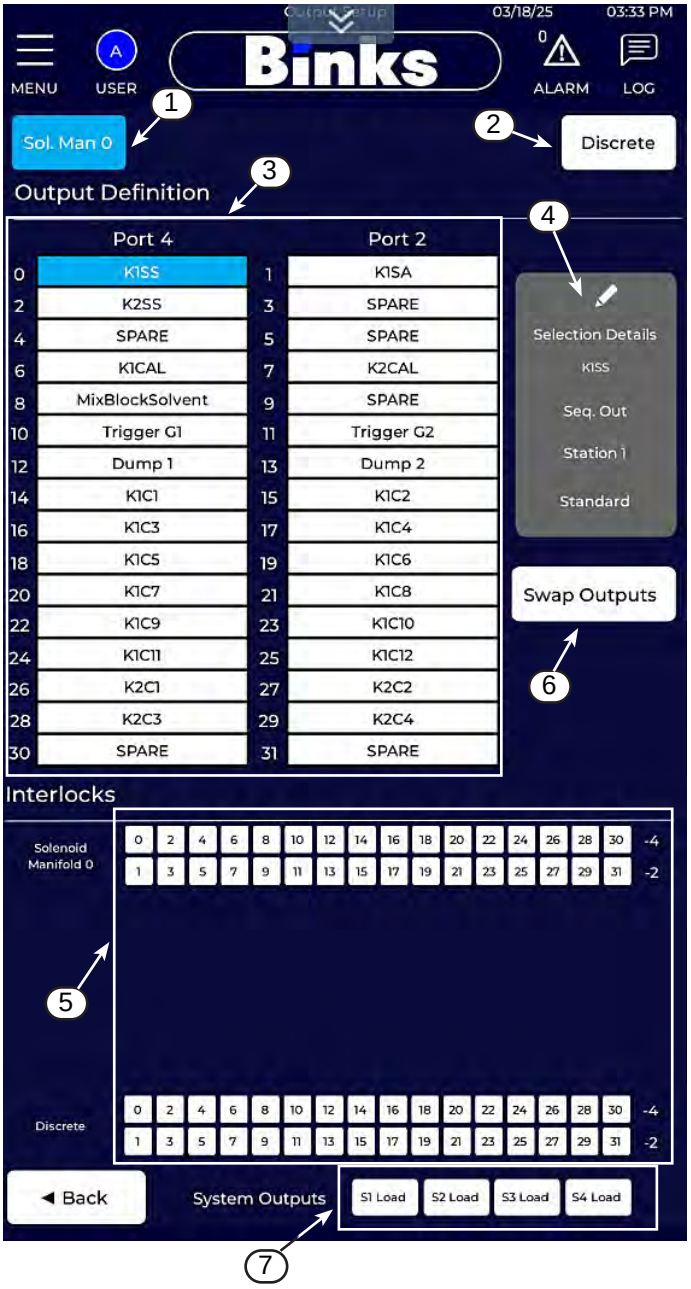
   Discrete refers to outputs hardwired within the RF2+ cabinet enclosure. Only 11 digital outputs (outputs 0–10) are available from this source. Discrete outputs 11–31 can be used to send signals over the fieldbus connection.

   To view the default functions of discrete outputs, refer to the RF2+ 77-3165-1 Installation Manual, section 09. Electrical Schematics.

2. Select the **Output Definition** (3) of the output you wish to edit. The **Selection Details** (4) section updates with each selection.

3. To modify the output details, press **Selection Details**. This opens a pop-up screen. Refer to 06.3.1.3 Configure Outputs for output configuration instructions.

Output **Interlocks** (5) prevent two incompatible outputs from being active at any given time.



NOTICE

Interlocks are scanned from lowest to highest. A solenoid with a lower number will always override a solenoid with a higher number.

To select or deselect an output as an interlock, press the necessary interlocked output button.

Swap Outputs (6) opens the swap outputs configuration screen. Section 06.3.1.4 Swap Outputs details how to swap an output.

S1 Load, **S2 Load**, **S3 Load**, and **S4 Load** (7) allow outputs to be interlocked with system functions Station 1 Load, Station 2 Load, Station 3 Load, and Station 4 Load.

Interlocking these functions can be used to prevent a solvent solenoid from being open at the same time as a color valve while a recipe is loaded. Using an interlocked solvent valve with these signals saves time because there is no need to interlock each CCV with a solvent valve.

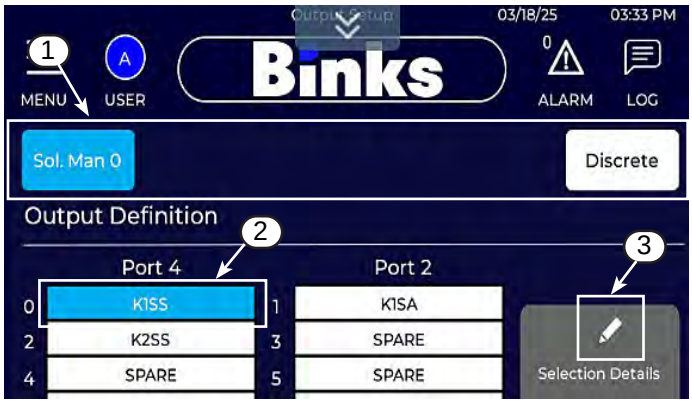
NOTICE

The system can only open a single CCV at any time, so it is not necessary to interlock CCVs with each other.

06.3.1.3 CONFIGURE OUTPUTS

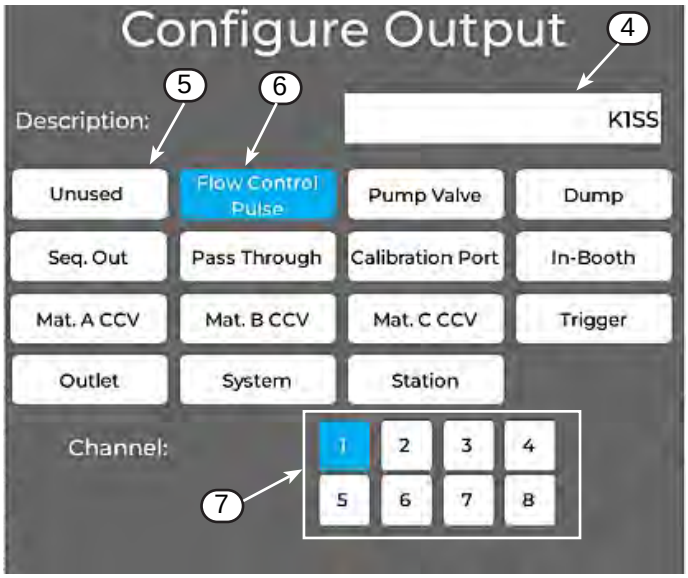
To configure an output:

1. Select the output source (1).
2. Select the output description (2).
3. Select the edit icon (3) in the **Selection Details** box. This opens the pop-up screen with modification options.



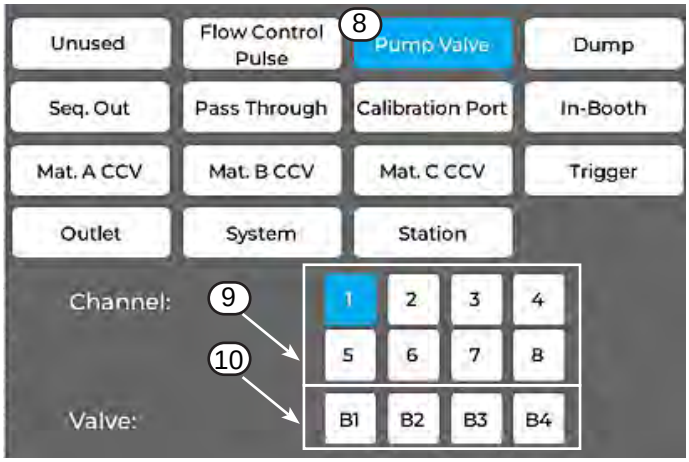
4. On the pop-up screen, enter the description of the output (4).
5. Select the output type. Options include:
   - **Unused** (5): Unused output.
   - **Flow Control Pulse** (6): Use this output as the pulse valve signal for a channel configured as a pulse valve.

     Select a channel number (7) for the output.



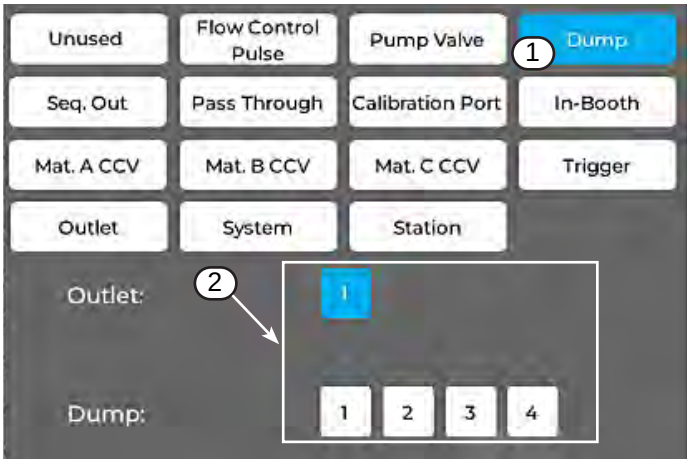
   - **Pump Valve** (8): Use this output as one of the 4 valves of a dispense pump.

     Select a **Channel** (9) and **Valve** (10) for the output.



- **Dump** (1): Dump valves let the user install a fluid valve near automatic spray guns, which can be opened during a flushing/loading sequence. The valve lets the material be dumped into a collection container without material flowing through the applicators.

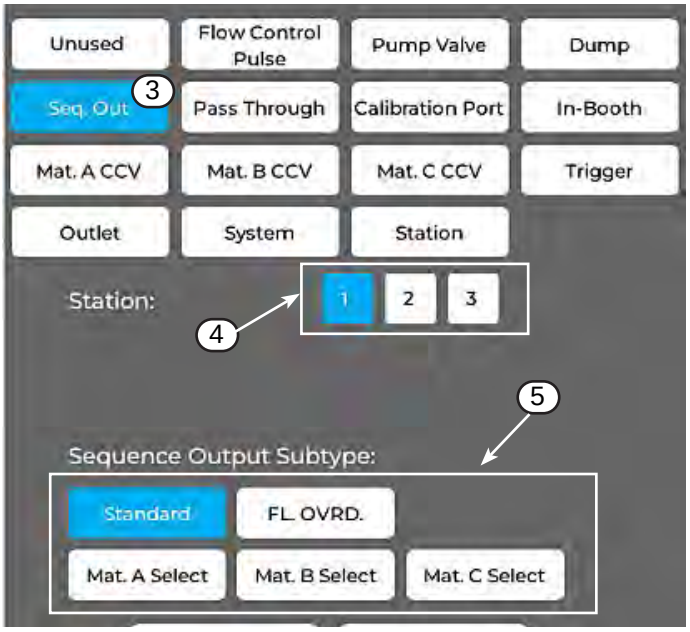
  Select an outlet and then a spray gun (2) for the dump function. The system will match the dump valve with the trigger valve on the spray gun.



NOTICE

Similar to a trigger command, a dump valve automatically triggers flow.

- **Seq. Out** (3): Sequence outputs are output signals only controlled by sequence steps. To configure a sequence output, first select a station (4) and then a **Sequence Output Subtype** (5). Options include:
  - **Standard**: The output used for any purpose during a sequence. It does not automatically trigger flow.
  - **FL OVRD.** (flow override): Triggers all outlets on the selected station to flow at the maximum flow setpoint specified in the current recipe. This subtype is redundant to the sequence function **Stn x Max Flow** (Refer to 06.4 Sequences), but it is kept here for backward compatibility.
  - **Mat. A Select**, **Mat. B Select**, **Mat. C Select**: The A, B, and C output selection indicates to the system that a color is loaded for the selected material. This function is redundant to the sequence function **Stn X Load** (Refer to 06.4. Sequences), but it is kept here for backward compatibility

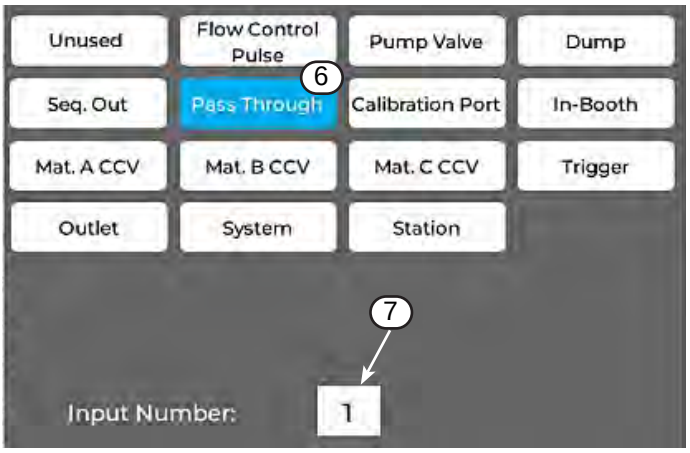


- **Pass Through** (6): This method lets the user set the solenoid manifold outputs for their own purposes by mapping the outputs to a hardwired input or a signal from the fieldbus.

  Hardwired inputs 1 – 16 are labeled on the electrical schematics as "User input x." If an input is not used for its primary function, it can be used here as a pass through. Inputs 16 – 64 are fieldbus signals only.

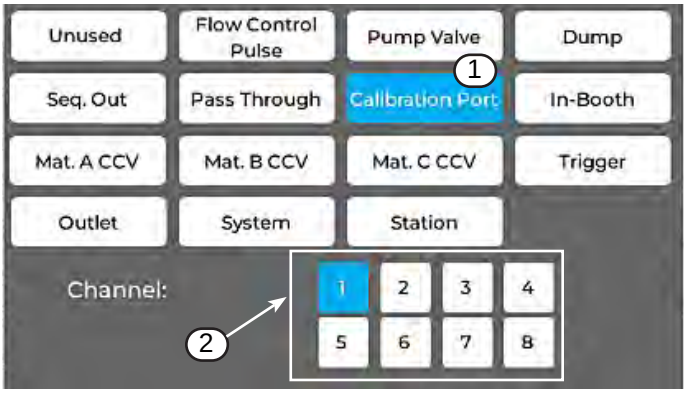
  The **Input Number** (7) is the input ID that will affect the output.

  For information, refer to the 77-3165-5 RF2+ Programming Manual.



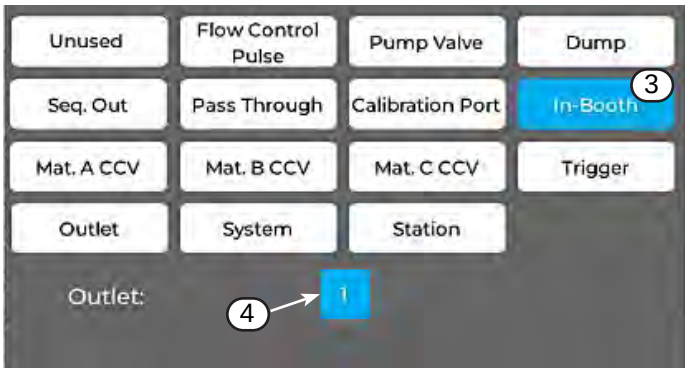
- **Calibration Port** (1): This output will automatically open during a flow meter calibration to let material flow into a measuring container.

  Select the channel (2) for the calibration port.



- **In-Booth** (3): This output is set up for an in-booth application. Users can control an in-booth color change box indicator through a standard manifold output. This eliminates the need to install the auxiliary indicator solenoid included in the kit.

  Select an outlet number (4) for the output.

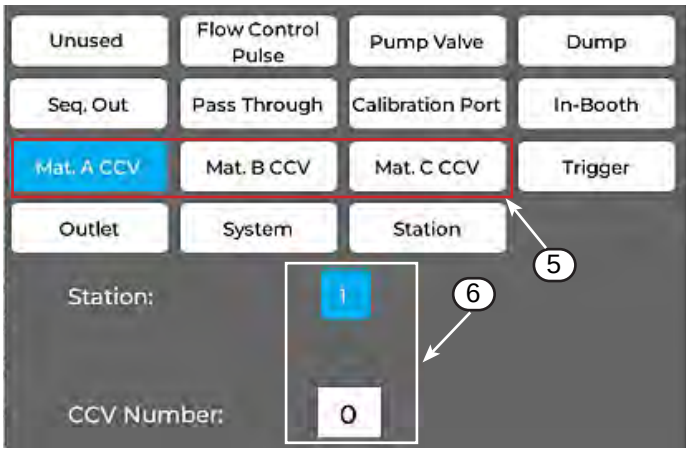


NOTICE

If the in-booth indicator output type is used, it will not work during an e-stop because the power will be removed from this solenoid.

- **Mat. A CCV**, **Mat. B CCV**, **Mat. C CCV** (5): The material valve (A, B, and C) in a color stack that lets recipe-selected material flow into the system.

  Select a station and then assign a CCV number (6) using the pop-up keypad screen.



NOTICE

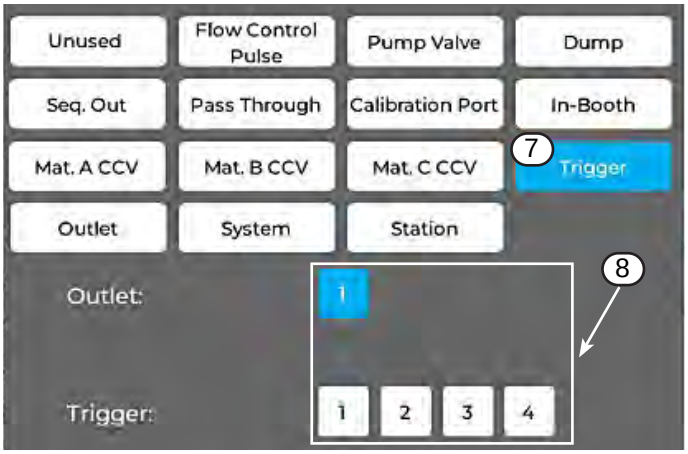
A station can have up to ninety-nine (99) CCVs for materials. Avoid duplicate valve numbers. When a duplicate valve number is configured, only the valve with the highest number will be opened.

- **Trigger** (7): An output configured as a trigger opens the trigger solenoid valve of an automatic applicator.

  Select an outlet and then a trigger number (8) for the output.

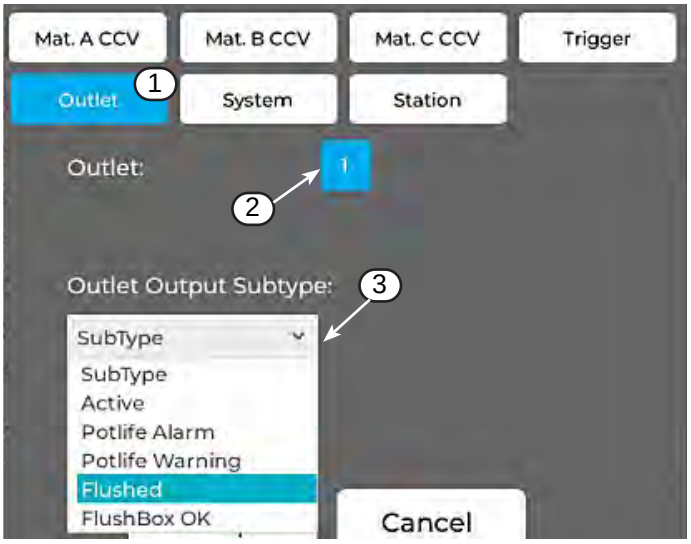
  This output type has no function with manual applicators unless a spray gun flush box is connected or an air cutoff is installed. When a flush box is connected, this output will be the flush box's trigger signal to open the spray gun during a flush procedure.

  When an air cutoff is installed, this trigger will open and close the air cutoff when the associated station starts and stops, respectively. The air cutoff also automatically closes when a sequence starts on an associated station.



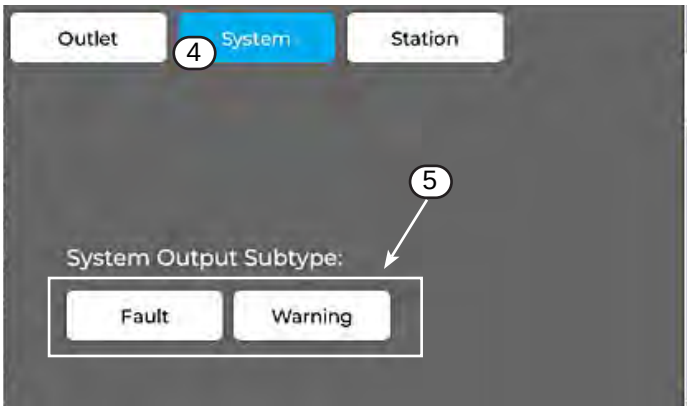
- **Outlet** (1): Configure outlet status signals to an output.

  Select an outlet (2) and then a subtype (3). Options include **Active**, **Potlife Alarm**, **Potlife Warning**, **Flushed**, and **FlushBox OK**.

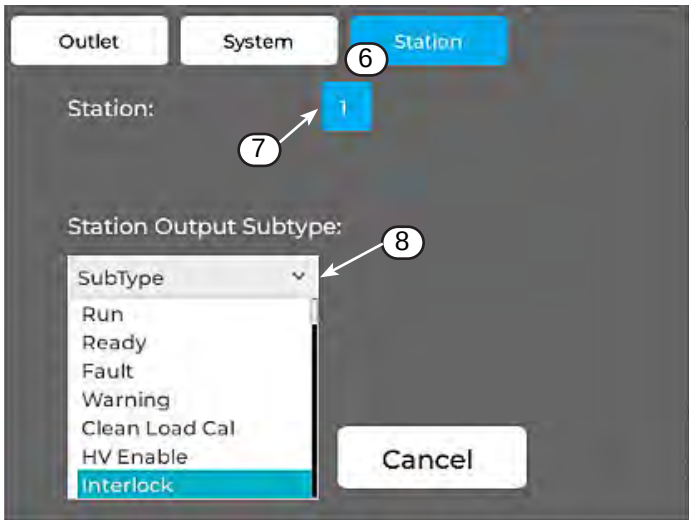


- **System** (4): Configure system status signals to an output.

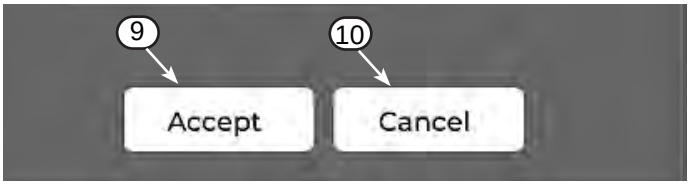
  Choose between **Fault** and **Warning** (5). Selecting **Fault** allows the output to stop material flow if a system fault occurs.



- **Station** (6): Configure station status signals to an output. Select a station (7) and then station output subtype (8).



6. Select **Accept** (9) to set the configured parameters.
7. Select **Cancel** (10) to stop the output configuration procedure.
8. Repeat configuration steps for each output.

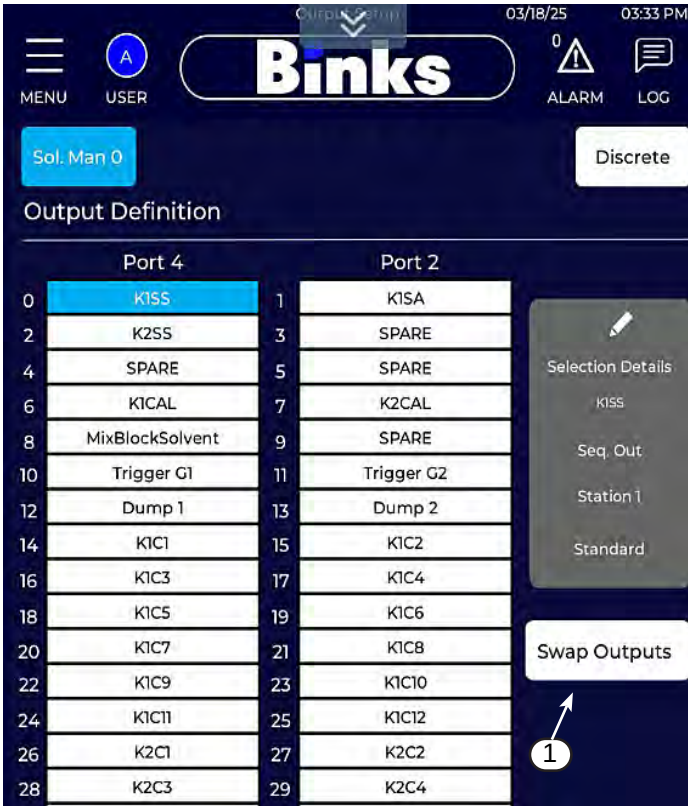


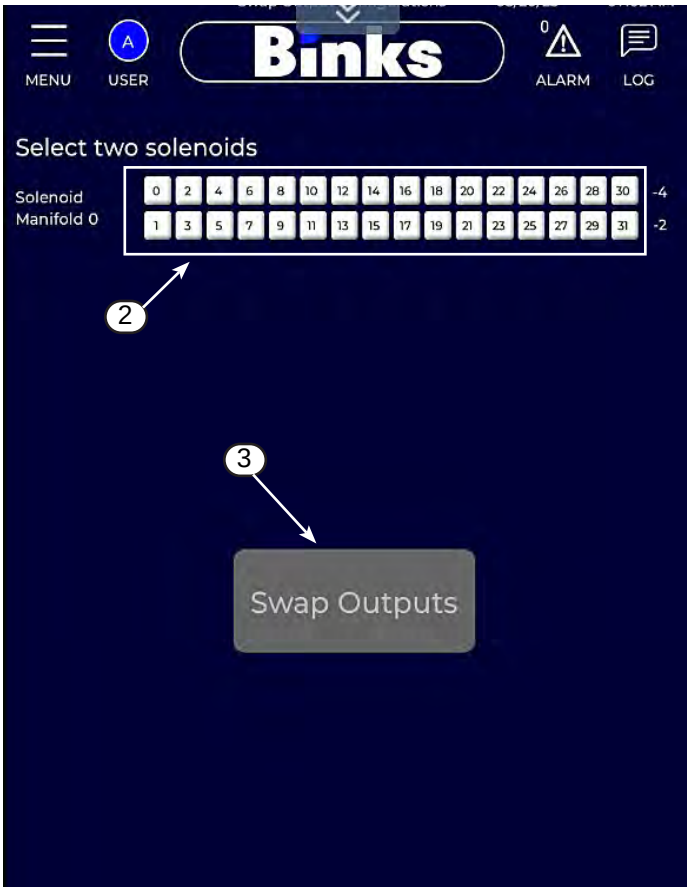
06.3.1.4 SWAP OUTPUTS

1. Select **Swap Outputs** (1) from the main output screen. This opens a pop-up screen.
2. Select any two outputs (2) to swap their configuration assignments.
3. Select **Swap Outputs** (3) to complete the output swap procedure.

NOTICE

When two outputs are swapped, their respective interlocks are also swapped. If they are part of a sequence function, the function definition is also automatically updated.





06.3.2 FLUID SEQUENCES

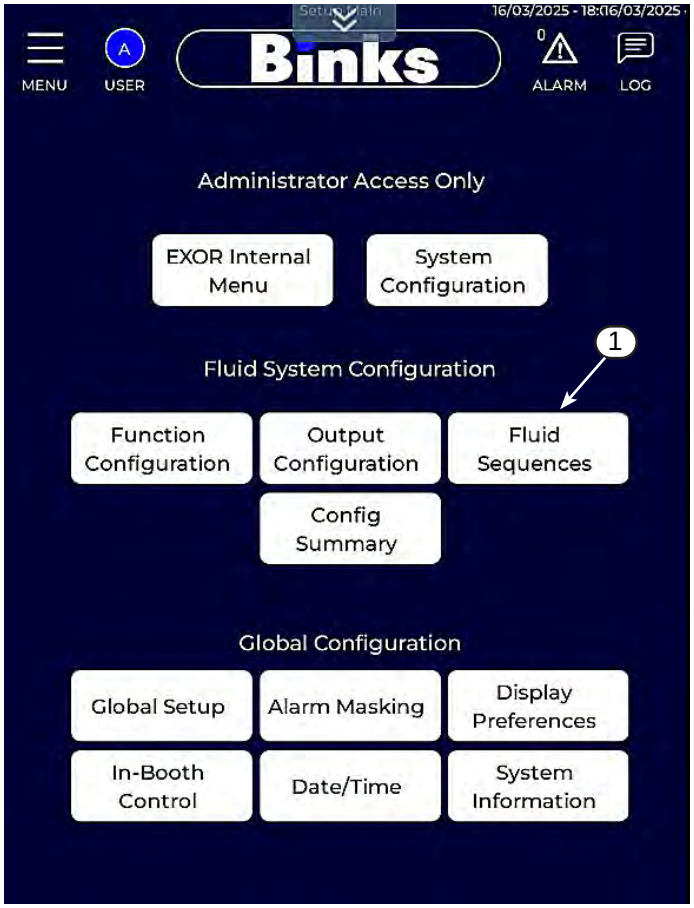
Sequences are user-programmable routines used when the system is loaded and flushed.

Sequences are initiated automatically when a recipe is loaded or changed, or they can be initiated manually for flushing.

The RF2+ supports up to 16 sequences per station. The sequences consist of 12 timed steps with user-selectable step times. Each step can contain up to 50 actions, which are called functions.

Functions enable valves or override system functions and allow material to be routed as necessary to load and flush materials in any number of piping topologies.

To access this screen, select **Fluid Sequences** (1) in the setup main screen.



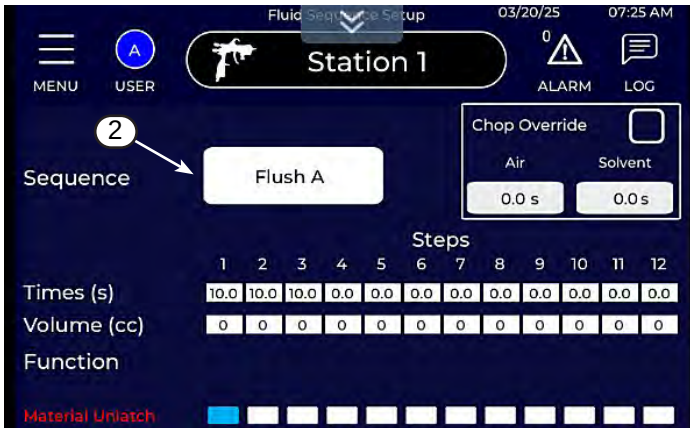
06.3.2.1 CHANGING FLUID SEQUENCES

Sequences define timing and which functions are active during each step of a fluid sequence.

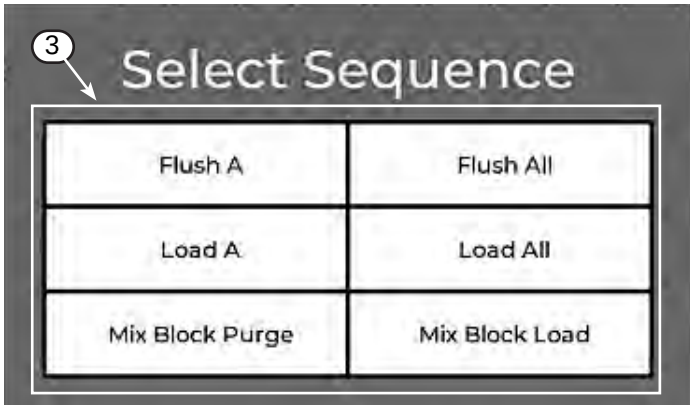
To change a sequence:

1. Select **Fluid Sequences** (1) on the main setup screen.

2. Select the box next to **Sequence** (2). In the example, it is **Flush A**.



3. This opens the sequence selection screen. Select a sequence option (3) to load the sequence details in the previous screen. Revisit this screen to modify each sequence.



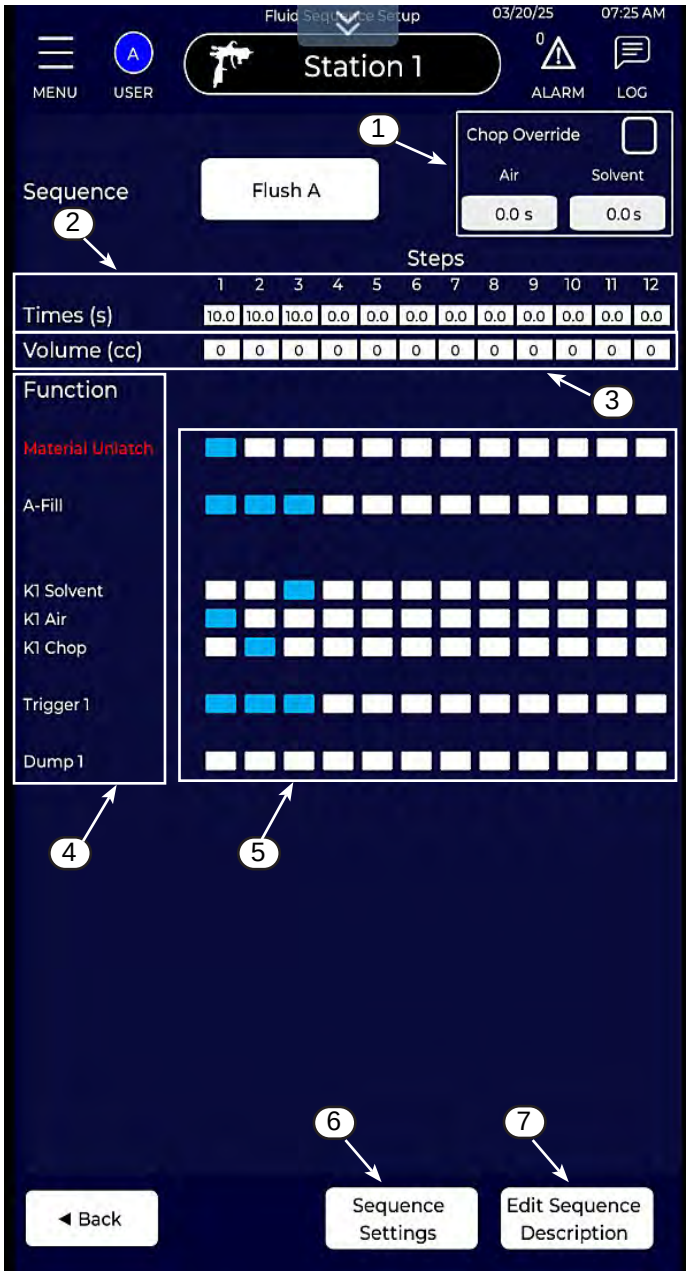
4. Users may select **Chop Override** (1) if not using global timing values for chop air and solvent. Enabling this feature allows users to enter air and solvent chop times in the fields below.
5. Set step times (2) for 12 steps. Times are listed in seconds. If a step is not required, enter 0.
6. Enter step volumes (3) for each step. Step volumes are the minimum volume that must flow during each step before the next step can begin.

   The step volume is measured as the total sum of all outlets configured for the current station. Configure the sequence to ensure the calculated volume follows the desired flow path.

NOTICE

For the sequence to progress to the next step, both the step time and the step volume values must be met. The system will wait until enough volume has flowed through the system or until the step time has passed, whichever takes longer.

7. The **Function** area (4) displays possible functions for each step of the sequence.
8. Each function represents a sequence row (5). Select the buttons in each column to enable or disable the function in the given step. Buttons are highlighted blue when enabled and white when disabled.
9. The system saves updates automatically.
10. To change **Sequence Settings** (6), refer to 06.3.2.2 Sequence Settings.
11. To **Edit Sequence Descriptions** (7), refer to 06.3.2.3 Edit Sequence Descriptions.



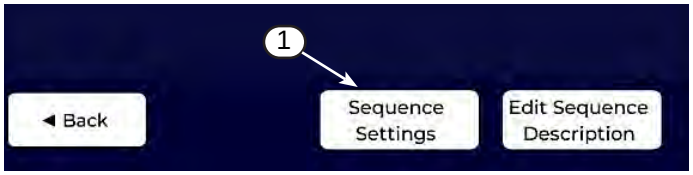
06.3.2.2 SEQUENCE SETTINGS

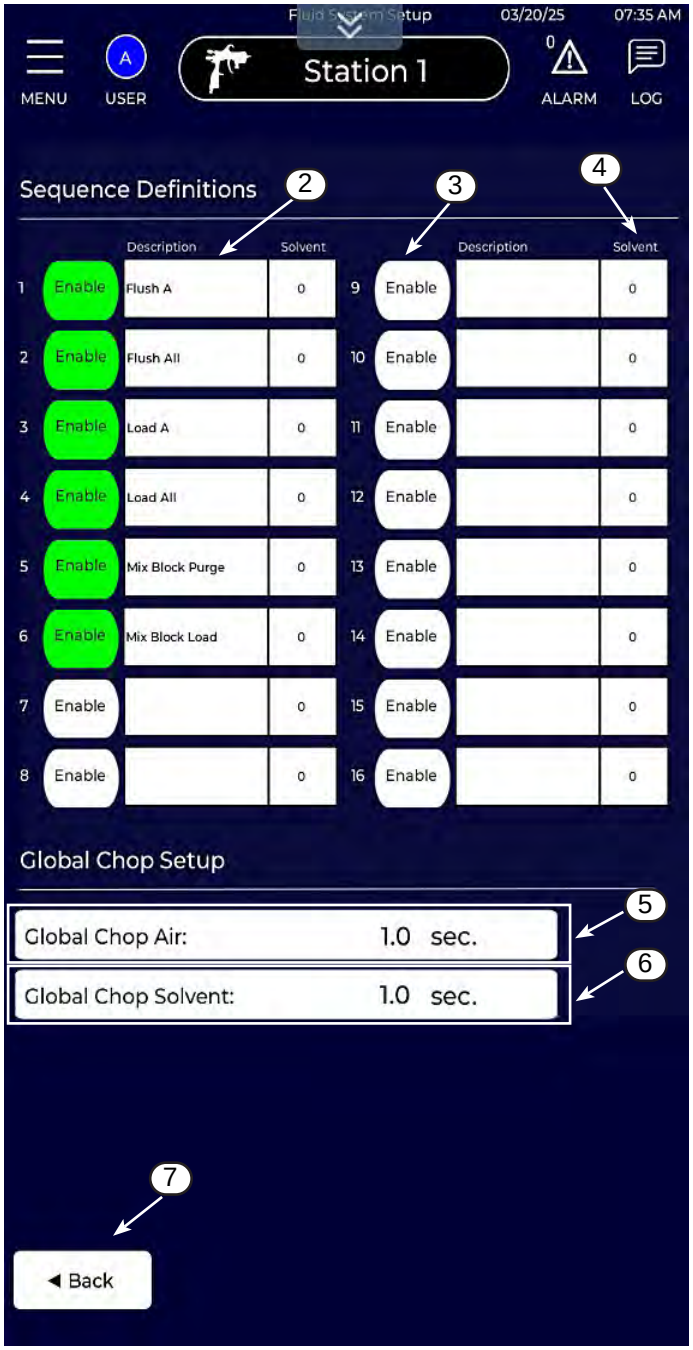
The RF2+ includes up to sixteen programmable sequences. To change sequence settings:

1. Select **Sequence Settings** (1) on the fluid sequences main screen.
2. If desired, rename a sequence in the **Description** box (2).
3. Select **Enable** (3) to enable or disable a sequence. If the button is green, the sequence is enabled.

   If a sequence is disabled, it will not appear on the main run screen, sequence editor, or in the recipe editor.
4. If a solvent flow meter is used for the station, enter a solvent-check value in the **Solvent** box (4). At the end of a sequence, the value gathered by the solvent meter flow during the sequence is compared to this value.

   If the total solvent flow during the sequence is less than the solvent-check, an alarm will be generated to alert the user that the lines were not properly flushed.
5. Enter system-wide values for chop timing in **Global Chop Air** (5) and **Global Chop Solvent** (6). If desired, each sequence can also be programmed with different chop timing values.
6. Select **Back** (7) to return to the fluid sequence main screen.





06.3.2.3 EDIT SEQUENCE DESCRIPTIONS

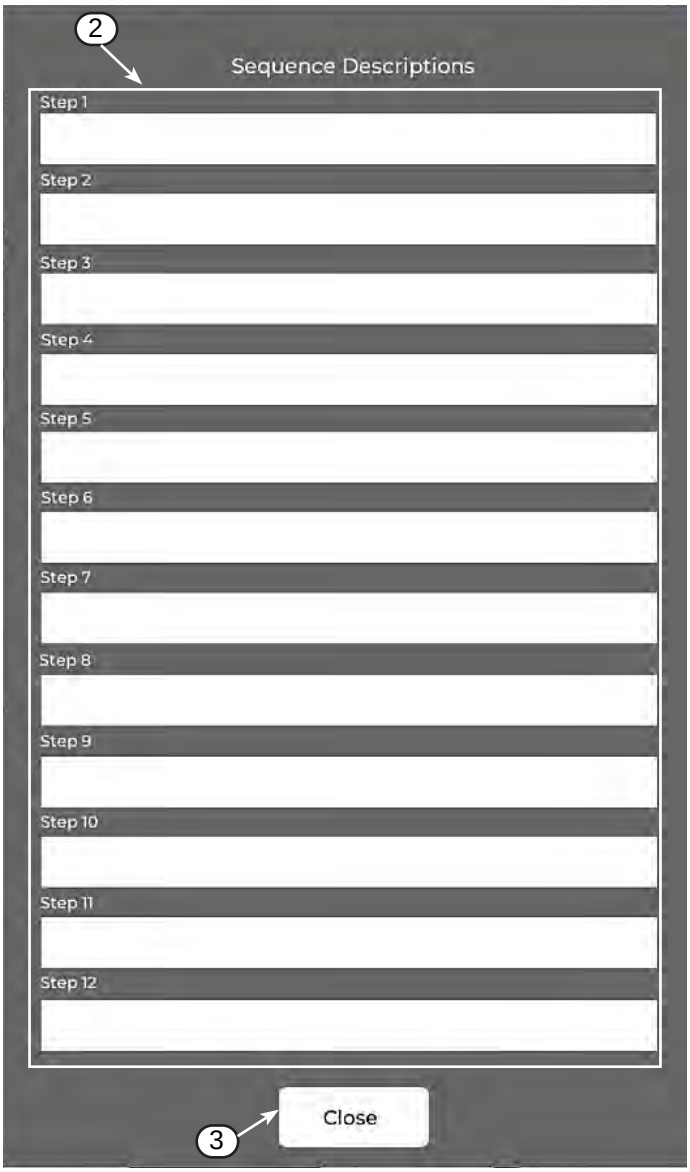
Use the sequence description editor screen to enter the text displayed for each step of a sequence. Each sequence has a maximum twelve sequence steps.

The text fields on the editor screen for the sequence description are the same as those on the sequence run screen. Any text entered on this page will also appear on the sequence run screen.

The length of the user text fields is unlimited, but the touchscreen will limit how much of the description can be seen.

To edit fluid sequence descriptions:

1. Select **Edit Sequence Description** (1) on the main fluid sequences screen.
2. Use the sequence description boxes (2) to rename or modify the descriptions of each step.
3. Select **Close** (3) when finished.



> ***NOTICE***
>
> Text entered on this screen will not be translated when the system language is changed.

06.3.2.4 SEQUENCE OPTIMIZATION TIPS

To optimize a sequence, consider:

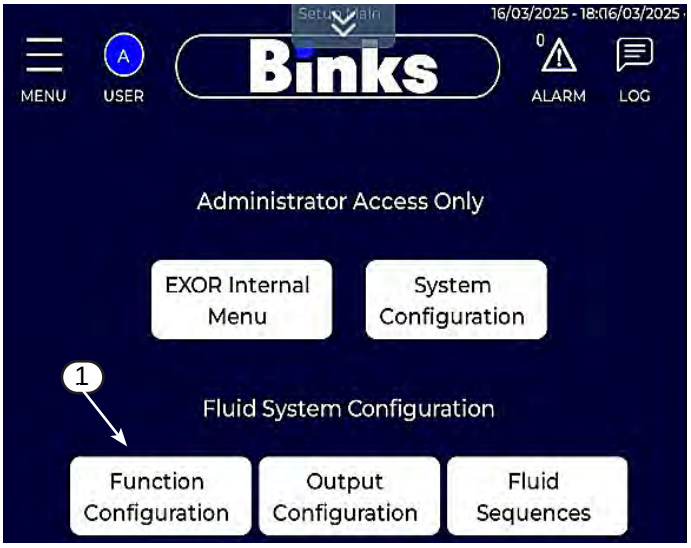
- Worst-case flushing: Always set up the flush parameters using the most viscous/worst-case material.
- Flushing air and solvent pressure: Higher pressures may reduce the time needed to flush the system but can create significant applicator spit during the procedure.
- Material viscosity: Viscous materials move slowly through the system and can require additional purge time.
- Hose volume/length: Longer fluid lines contain a larger material volume and may need a longer flush time. Pressure drop through a longer hose or smaller diameter hose will affect the required time to purge material and clean the system.
- Spray applicator tip size: Small tips can restrict flow during a flush.

The suggestion below can help to optimize the system and minimize solvent use during color changes and flushes:

- Use air instead of solvent for the first flush.
- Let the chop process do most of the cleaning.
- Do not use more solvent than necessary for the last solvent flush.

06.3.3 FUNCTION CONFIGURATION

Select **Function Configuration** (1) from the main setup screen to access the function configuration screen



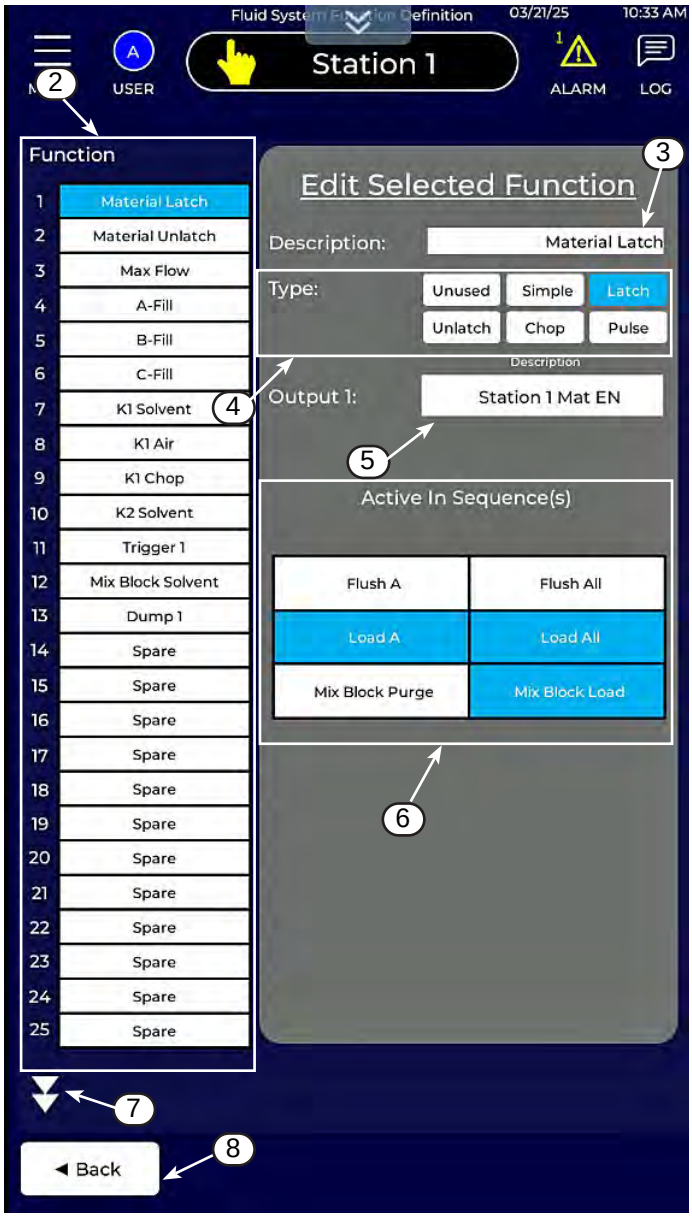
06.3.3.1 EDIT SELECTED FUNCTION

The functions can be selected along the left side of the screen (2). There are fifty functions available per station.

When a function is selected, its configuration information is shown on the right-hand side of the screen. These parameters can be modified by changing the parameters.

Users can modify the following parameters:

- **Description** (3): Description of the function selected. Often, this mirrors the output it works on.
- Function **Type** (4):
  - **Unused**: Function is not in use.
  - **Simple**: Turns an output on when enabled in a sequence step. Turns an output off when not enabled in a step.
  - **Latch**: Turns on an output. The output remains on until an unlatch signal turns the output off. Outputs will remain on even when the system is stopped.
  - **Unlatch**: Turns a latched output off.
  - **Chop**: When turned on in a sequence step, two outputs are turned on/off in an alternating time period determined by the sequence. Selecting this option opens up a second output box.
  - **Pulse**: Turns on an output for a timed pulse typically used to send a signal to a remote system over fieldbus. Selecting this option displays a box for inputing the pulse time in milliseconds.
- **Output 1** (5): Select an option for output 1 from the box to the right of the button. 06.3.3.2 Select Standard Outputs covers output options.
  - Output 1 is used for simple, latch, unlatch, and pulse function types.
  - For chop functions, Output 1 is the first output turned on and corresponds with the air field in the chop time settings. Output 2 is the second output turned on by this function and corresponds with the solvent field in the chop time settings. Output 2 appears when the **Chop** function is enabled.
- **Active In Sequence(s)** (6): Select all sequences used for the selected function.
- Down arrows (7): Press the down arrows to access functions 26–50.
- Select **Back** (8) to return to the main setup screen.



06.3.3.2 SELECT STANDARD OUTPUTS

Any solenoid can be turned on during a sequence. To turn on a solenoid, assign it to a sequence function.

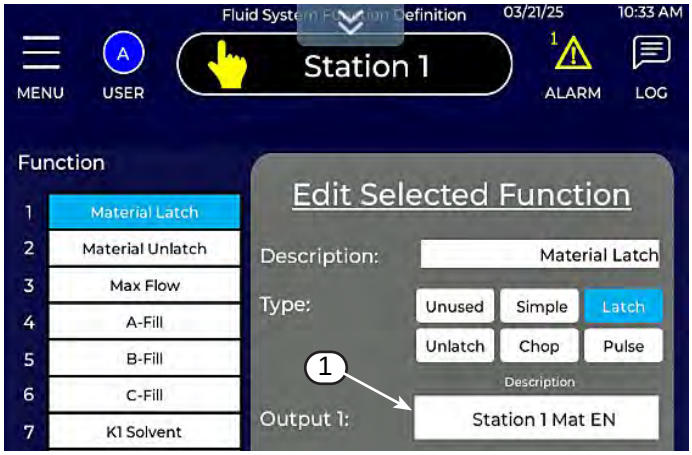
The select output menu is used to select an output to assign to a function.

To select an output:

1. Select the box next to **Output 1** (1). Output 2 will also be available if creating a chop function.
2. Select an output from the **Sol. Man 0** list (2).
3. Select **Close** (3) to return to the main function configuration screen.

If an output is not set up as a sequence output, it can still be activated when used as part of a sequence. It lets a trigger output be activated during a flush without the need for the customer's equipment to activate the applicator triggers.

In the case of spray gun flush boxes, this is how the flush box trigger will be activated.



06.3.3.3 SELECT FUNCTION OUTPUTS

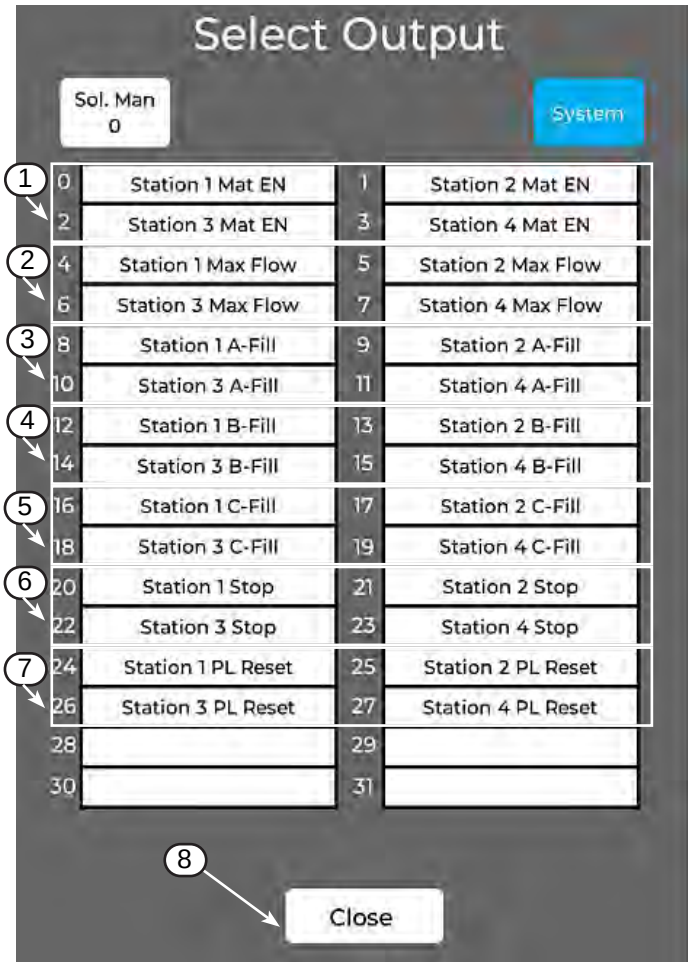
System outputs are predefined outputs used internally to the system to activate certain features. Like configured outputs, these are called by function. Options include:

- **Station "X" Mat EN** (1): Tells the system when the material is being loaded or when the system is being flushed.

  When active, the material valves for the selected station recipe will be active. When deactivated, the system will assume the flow of solvent or air.

  This command is used with a latch function set at the start of any load sequence. It is cleared with an unlatch at the start of any flush sequence.
- **Station "X" Max Flow** (2): Use this function during a load sequence. When active, the flow command for the outlet will be the recipe called "Sequence High Flow Rate." Materials will mix on ratio at this rate instead of the "Default Flow Rate."
- **Station "X" A-Fill** (3): When active, the station's A channel will be forced to be fully open. Use this function to purge operations or load material quickly to the flow meter.
- **Station "X" B-Fill** (4): When active, the station's B channel will be forced to be fully open. Use this function to purge operations or load material quickly to the flow meter.
- **Station "X" C-Fill** (5): When active, the station's C channel will be forced to be fully open. Use this function to purge operations or load material quickly to the flow meter.
- **Station "X" Stop** (6): When a sequence is run and contains this function, the station will automatically stop at the end of the sequence. This function is typically used for an end-of-day flush, when the system is set to automatically shut off after a system flush.
- **Station "X" PL Reset** (7): Manually resets the pot life timers on the station. This function can be used together with a mix block flush, where solvent does not pass through the flow meter to reset the pot life normally. Take care to avoid using this option when the lines may not be flushed, as no pot life alarms will occur.

After selecting an option, select **Close** (8) to return to the main function configuration screen.



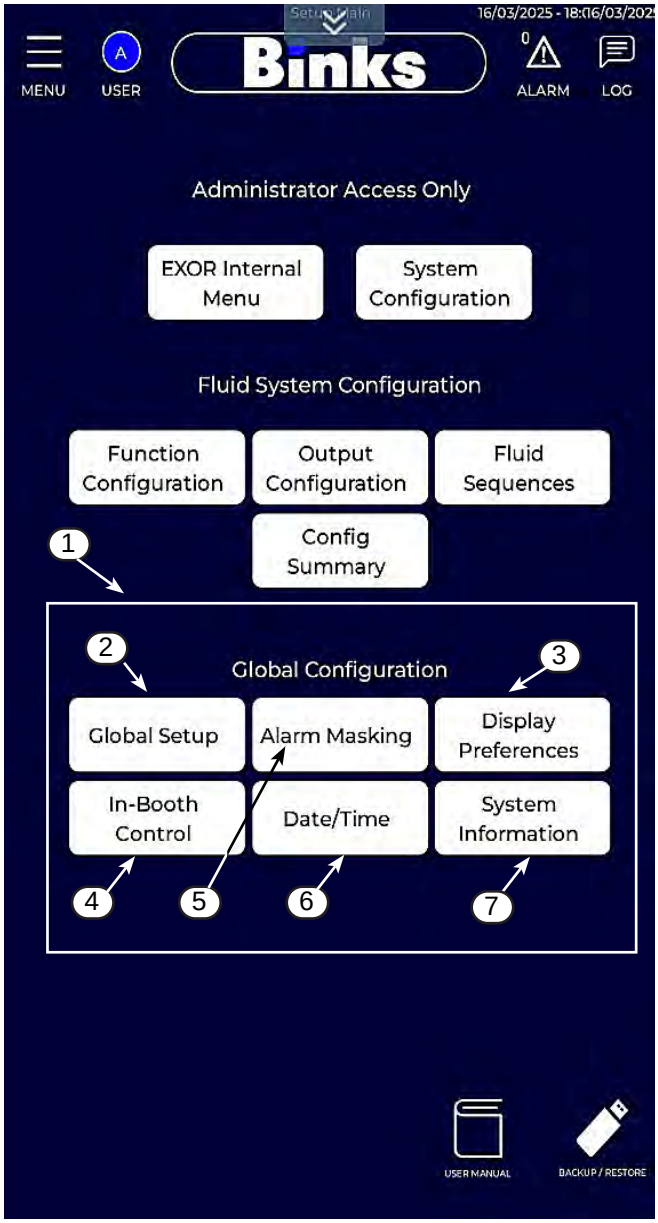
06.4 GLOBAL CONFIGURATION

Global Configuration settings (1) affect system behavior regardless of the recipe that is loaded.

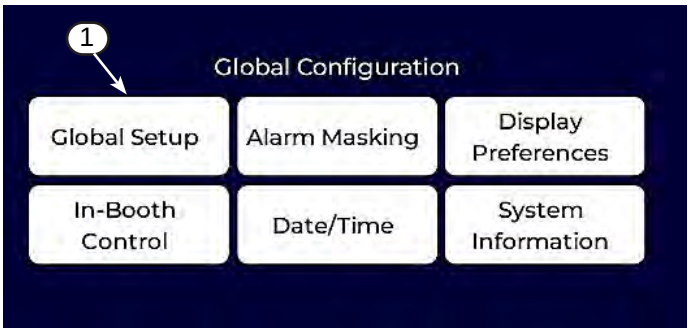
Global configuration settings include:

- **Global Setup** (2)
- **Display Preferences** (3)
- **In-Booth Control** (4)
- **Alarm Masking** (5). Refer to 07.7.2. Alarm Masking for more information on this function.
- **Date/Time** (6)
- **System Information** (7)

Parameters that are irrelevant for the system configuration will not be shown.



06.4.1 GLOBAL SETUP



Global parameters affect system behavior regardless of the recipe that is loaded.

To change global parameters, press **Global Setup** (1) on the main setup screen.

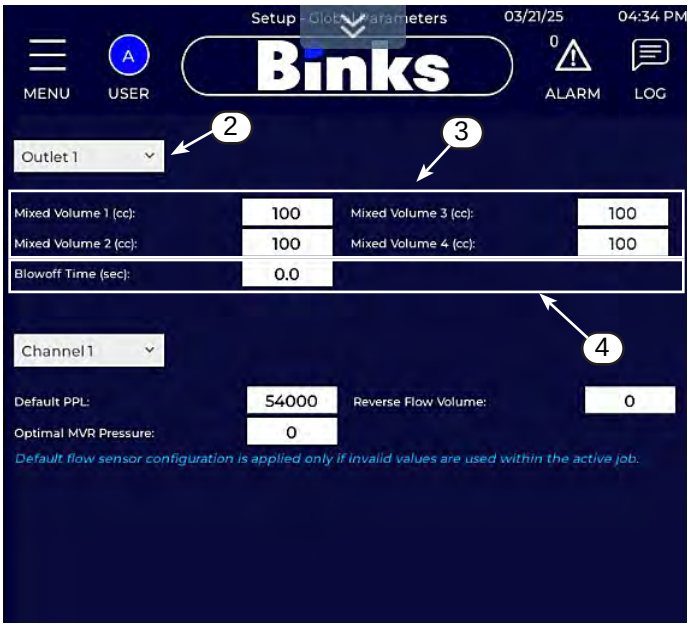
Parameters that are not relevant based on the system configuration will not be shown. Parameters include:

- **Outlet** box (2): Select an outlet to view and modify parameters.
- **Mixed Volume 1–4** (3): Mixed volume is the estimated volume from the mix block outlet to the applicator inlet. It is used to calculate the pot life for each applicator.

  Refer to the calculation table shown below for volume estimates based on material delivery hose length and inside diameter (ID).

  When the system is flushed, the flush volume must be greater than the mixed volume to fully reset an applicator's pot life.

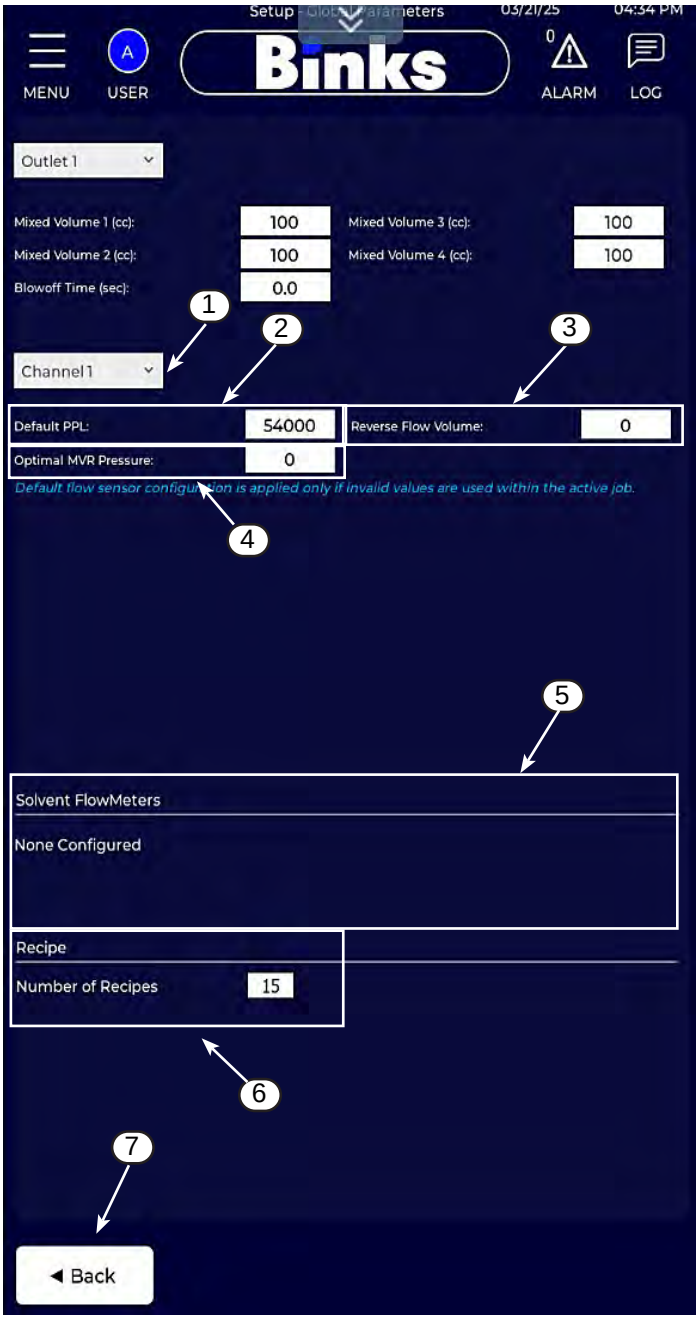
  - **Mixed Volumed 1** is the volume measured when trigger 1 of an outlet is active.
  - **Mixed Volume 2** is the volume measured when trigger 2 of an outlet is active.
  - **Mixed Volume 3** is the volume measured when trigger 3 of an outlet is active.
  - **Mixed Volume 4** is the volume measured when trigger 4 of an outlet is active.
- **Blowoff Time** (4) is used with manual applicators to cause a delay between the turn-on of the trigger air flow switch and when the flow meter first detects flow. It lets the operator use the applicator to blow off the part without triggering a no-flow alarm.



MIXED VOLUME 1-2 CALCULATION TABLE					
Hose size	15 ft	25 ft	50 ft	75 ft	100 ft
1/4" ID est. volume	225 cc	325 cc	600 cc	875 cc	1150 cc
3/8” ID est. volume	400 cc	625 cc	1200 cc	1775 cc	2350 cc

- **Channel** box (1): Select a channel to view and modify parameters.
- **Default PPL** (2): If a recipe is loaded with an invalid PPL value, the system will default to this value.
- **Reverse Flow Volume** (3): If the reverse flow is measured by any flow meter, the reverse flow volume can be set to shut down the system. The reverse flow volume detects a failed check valve in the mix block, which may lead to material contamination if the system is not shut down. To disable this alarm, set the value to 0.
- **Optimal MVR Pressure** (4): When automatic inlet regulation is used, this is the starting pressure for the inlet pressure regulators.
- The following parameters only appear for dispense pump channels:
  - **Inlet Pressure**: The scaling used for the dispense pump upper pressure sensor.
  - **Outlet Pressure**: The scaling used for the dispense pump lower pressure sensor.
  - **Position Sensor**: The scaling used for the dispense pump position sensor.
  - **Enable Flow Switch**: Enables a flow switch for the dispense pump channels. The flow switch will shut down the station if no flow is detected when the pump is moving.
- **Solvent FlowMeters** (5): Sets the PPL value used with station solvent flow meters.
- **Number of Recipes** (6): Displays number of recipes available in the recipes screen and the change recipe function.

  Limiting the recipes available on this screen will not allow operators to access them in other areas of the HMI.
- **Back** (7): Return to main setup screen.



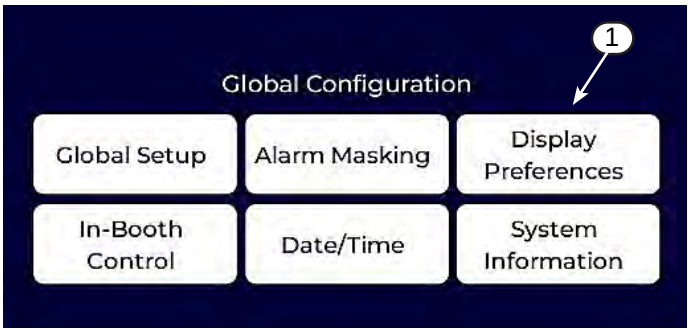
06.4.2 DISPLAY PREFERENCES

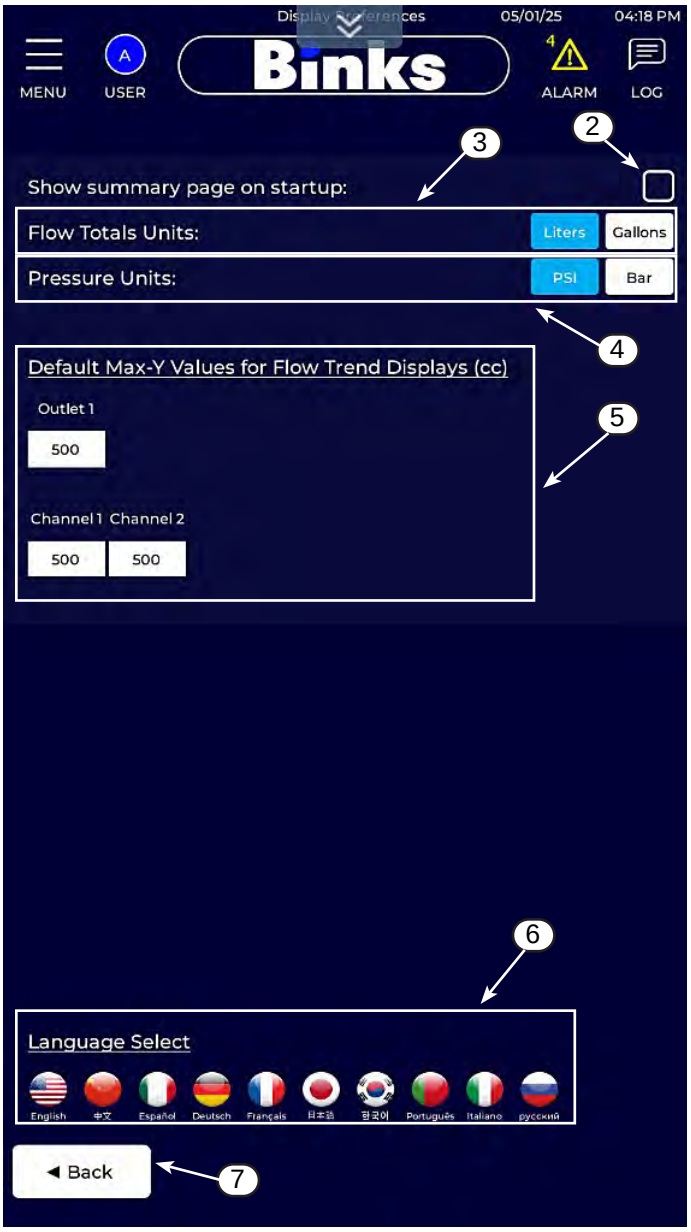
Use the display preferences screen to change items that do not affect system performance but affect the way that data is displayed, such as language and measurement units.

To change display preferences:

1. Select **Display Preferences** (1) on the main setup screen.
2. Select the **Show summary page on startup** checkbox (2) to display the startup configuration summary page screen for the system when it is powered up.
3. Select either **Liters** or **Gallons** (3) to display the user's preferred liquid measurement unit.
4. Select either **PSI** or **Bar** (4) to display the user's preferred pressure measurement unit.
5. Enter the **Default Max-Y Values for Flow Trend Displays (cc)** (5) for the preferred maximum scaling option values. The maximum y-value is 3500.

   The scaling options show trends when the outlet or channel pop-up screen opens. When a trend display is open, it will revert to this value for scaling the flow feedback.
6. If desired, select a new language for the HMI in the **Language Select** area (6).
7. Select **Back** (7) to return to the main setup screen.





06.4.3 IN-BOOTH CONTROL–REMOTE COLOR CHANGE BOX CONFIGURATION

The remote color change box is an optional purchased accessory that is used to remotely control a station from inside of the spray booth. It is available in 7 or 14-color versions.

The color-change controller is connected through an intrinsic barrier (Zener barrier) located outside the hazardous area to the RF2+ device.

Installation instructions for the remote color change box are included with the kit

To configure parameters for the color change box:

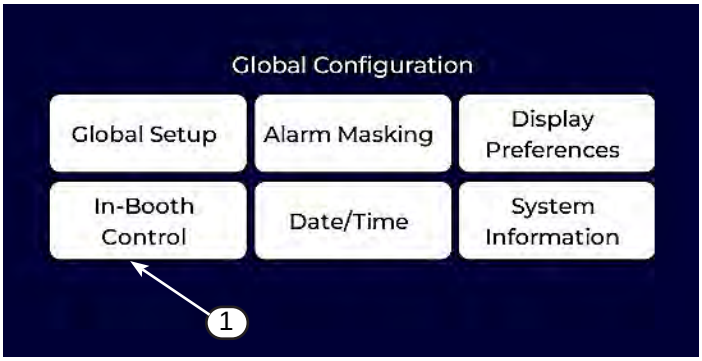
1. Select **In-Booth Control** (1) from the main setup menu. This opens a new page to configure the remote color change box.
2. The remote color change box configuration screen will open with 14 selections (2) shown in the left column.

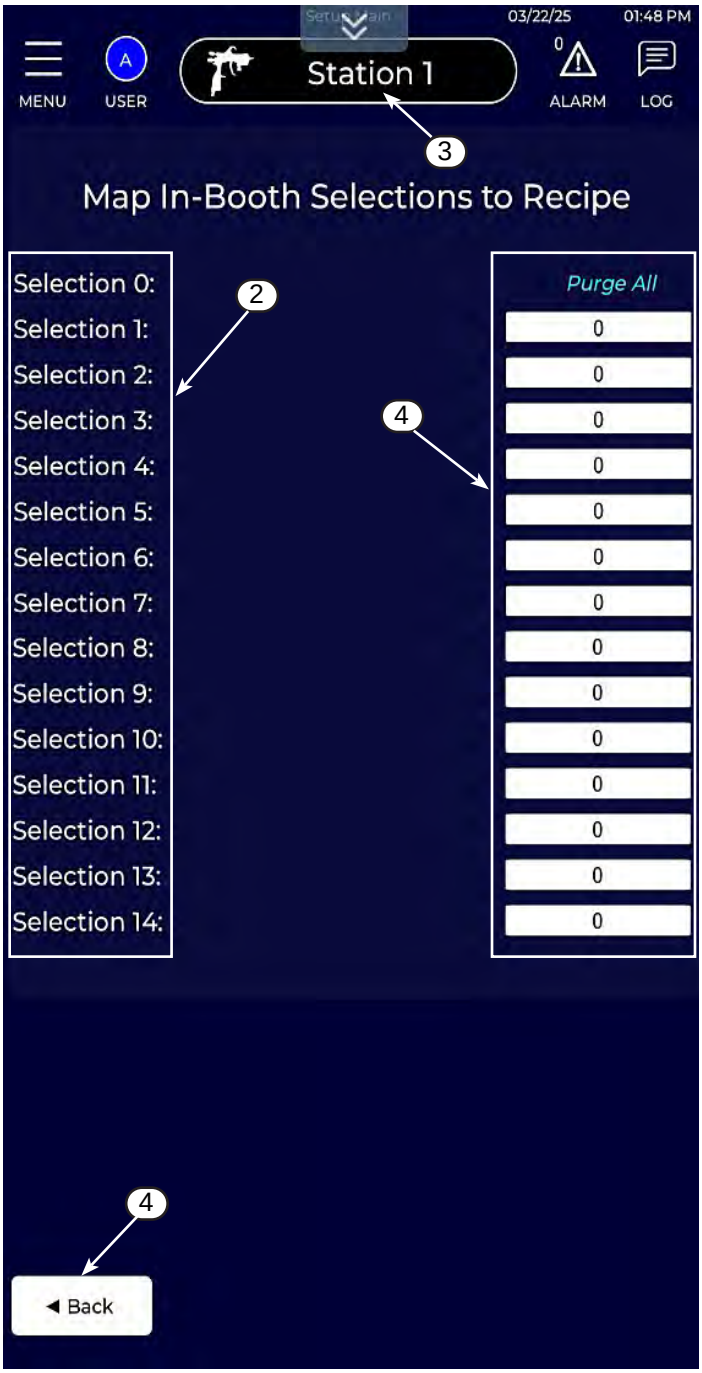
   When multiple stations are configured, each station will require its own in-booth controller. Ensure the correct station is selected at the top of the screen (3) before making changes to this page.

   For users with a 7-color change box, selections 8-14 will not be used.

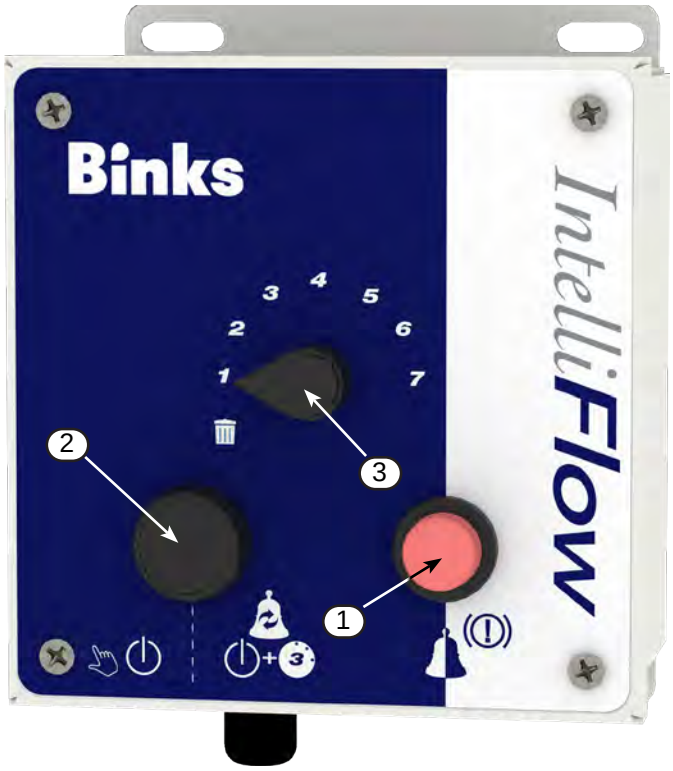
> **NOTICE**
>
> Selection **0** will always use the "purge all" sequence of the active recipe. It is not necessary to manually purge when changing colors, as the system will automatically flush when a new color is selected.

3. If already entered, the recipe selections will load and be shown in the right column (4).
4. To add or change recipes:
   a. Click inside the field adjacent to the selection number. A pop-up screen will appear.
   b. Select the desired recipe number.
   c. Press **Enter** to add the recipe to the selection.
5. Repeat this procedure as needed for additional recipes, up to either 7 or 14.
6. Press **Back** (4) to return to the main setup screen.





7. When an alarm is present, the alarm indicator light on the color change box (1) will illuminate.
8. To clear an alarm and restart the station, press and hold the button (2) for 3 seconds.
9. To change colors on the 7-color change box, select the desired color number with the color selector knob (3), then press the button (2) for 1 second.
10. To change colors on the 14-color change box:
    a. Select the color range with the indicator (4). Select either **1–7** or **8–14**.
    b. Select the desired color with the color selector knob (5).
    c. Press the button (2) for 1 second.



06.5 RECIPES

The RF2+ software is configured through "recipe" parameters, which can be modified per the material in use. A recipe is a set of material-specific parameters used to govern station operations.

Each station has its own set of recipes. Stations can store up to 250 recipes. However, the number of recipes shown on the recipe screen depends on the system settings. Refer to 06.4.1 Global Setup to configure the number of recipes shown at a time.

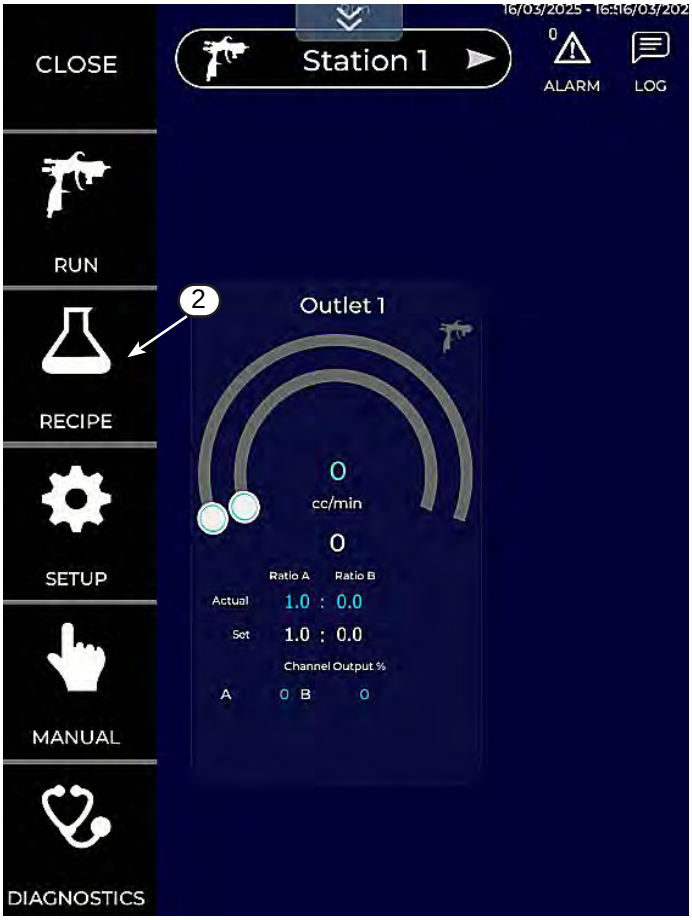
The parameters for each recipe are organized into three groups:

- **Materials**: Applied to the whole station.
- **Outlets**: Applied to the selected station applicator or outlet.
- **Channels**: Applied to the selected outlet's individual fluid channels.

To load a recipe, refer to 07.3.1 Load Recipes.

To access the recipe screen:

1. Select **MENU** (1) to open the drop-down menu.
2. Select **RECIPE** (2).



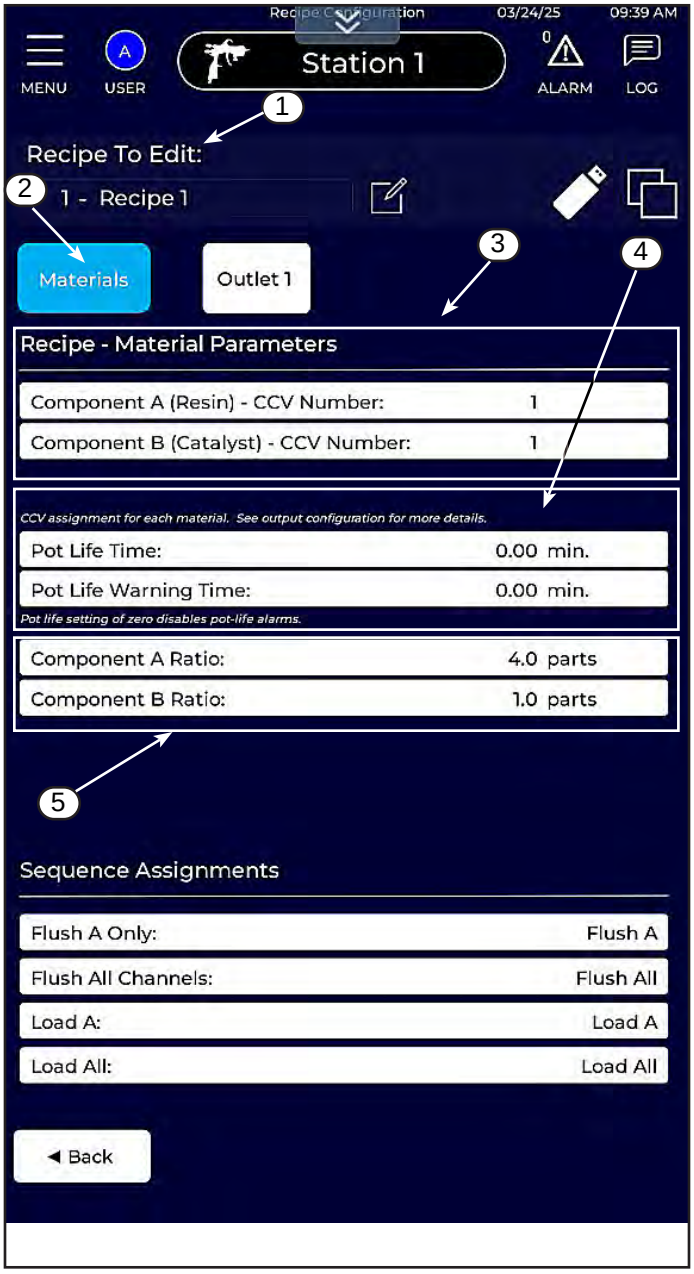
06.5.1 MATERIALS–STATION AS A WHOLE

To access and change these settings:

1. Select **Recipe To Edit** (1). This opens a pop-up screen with a drop-down menu of recipe options. Choose the recipe you wish to modify.
2. The **Materials** selections (2) will open.
3. View component-level recipe data under **Recipe - Material Parameters** (3). Data are available based on the number of channels configured for the selected outlet.
   a. **Component A (Resin) - CCV Number**: The color valve assignment for the resin stack for the selected recipe.
   b. **Channel B (Catalyst) - CCV Number**: The color valve assignment for the catalyst stack for the selected recipe. Available only for 2 or 3 component materials.
   c. **Component C (Reducer) - CCV Number** (not shown in image): The color valve assignment for the reducer stack for the selected recipe. Available only for 3 component materials.
4. **Pot Life Time** (4) indicates the amount of time, in minutes, that a mixed material can remain in the line before it must be flushed from the system. Exceeding this time triggers the pot-life alarm.

   Pot Life Warning Time is the amount of time, in minutes, a warning alarm sounds before the pot life time is reached. Setting a pot-life warning allows users to anticipate the end of the pot life before the time is exceeded.

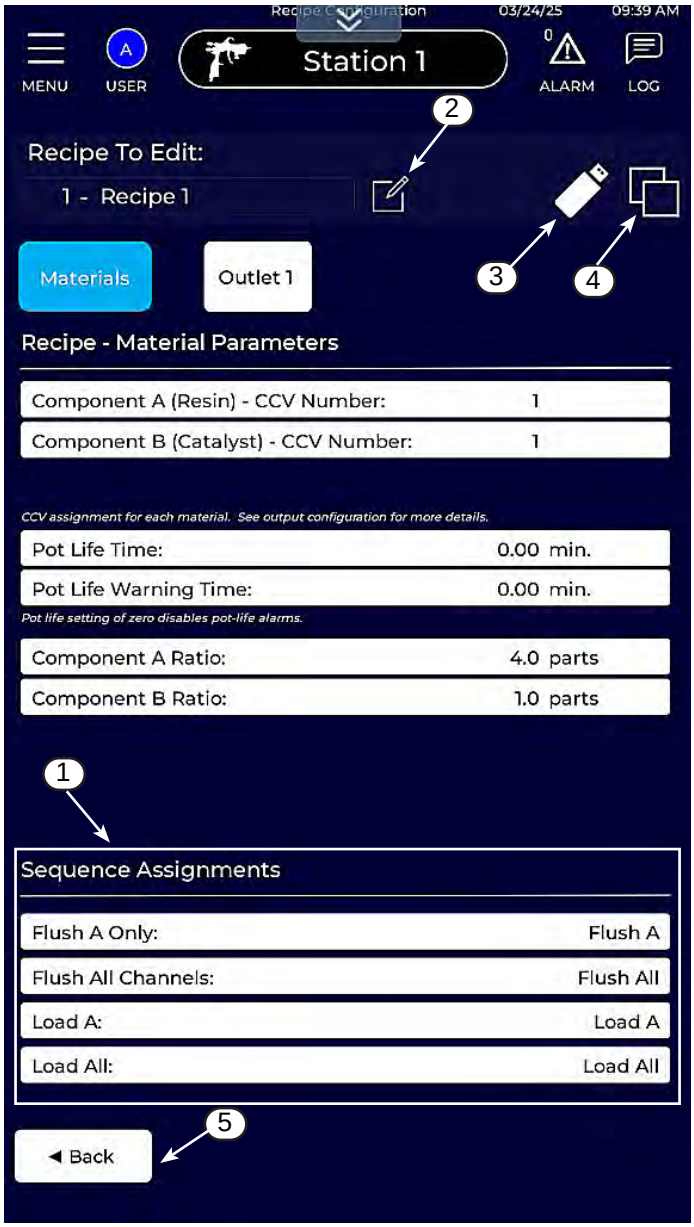
   Set **Pot Life Time** and **Pot Life Warning Time** to zero (0) to disable each feature.
5. **Component A**, **B**, and **C Ratio** (5) displays the ratios for 2 or 3 component outlets. Components A (resin) and B (catalyst) are given in parts. Component C (reducer) is given as the percentage of the total flow.



6. **Sequence Assignments** (1) include:
   a. **Flush A Only**: A programmable sequence number that is run when a "purge A only" command is given. It occurs when a new material loads that uses the same catalyst and reducer.
   b. **Flush All Channels**: A programmable sequence number that is run when a "purge all" command is given. This occurs when a new material is loaded and requires a change in catalyst or reducer.
   c. **Load A**: A programmable sequence number that is run when a "load A" command is given. It occurs when a new material, typically a resin, loads after any necessary purges have been completed.
   d. **Load All**: A programmable sequence number that is run when a "load" command is given. It occurs when new material for the outlet loads after any necessary purges have been completed. "Load All" will be called any time a "Flush All" sequence has been previously called.
7. Select the edit icon (2) next to the current recipe description to change the description of the recipe. Selecting the edit icon opens a pop-up screen where users can enter the new recipe description.
8. Select the backup/restore icon (3) to save either the entire system configuration or individual parts of it. Users may transfer saved configuration settings from one RF2+ to another or restore settings in the event of a system failure resulting in the loss of data.

   Another way to access the backup function is to select the backup/restore icon on the main setup screen (06.1.1 Setup Main Screen).

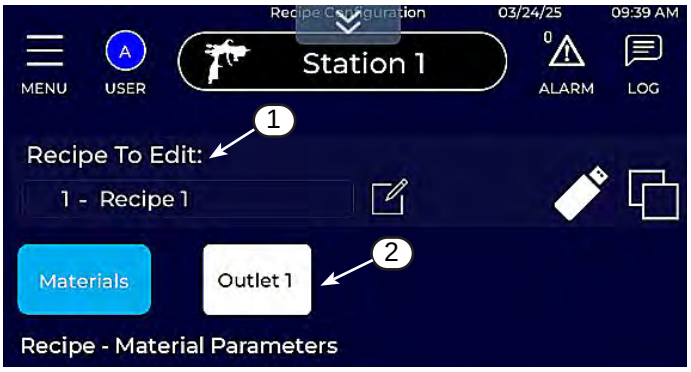
   For complete backup/restore information, refer to 08.4 Backup/Restore.
9. Select the copy recipe icon (4) to copy the recipe.
10. Select **Back** (5) to return to the materials recipe screen.

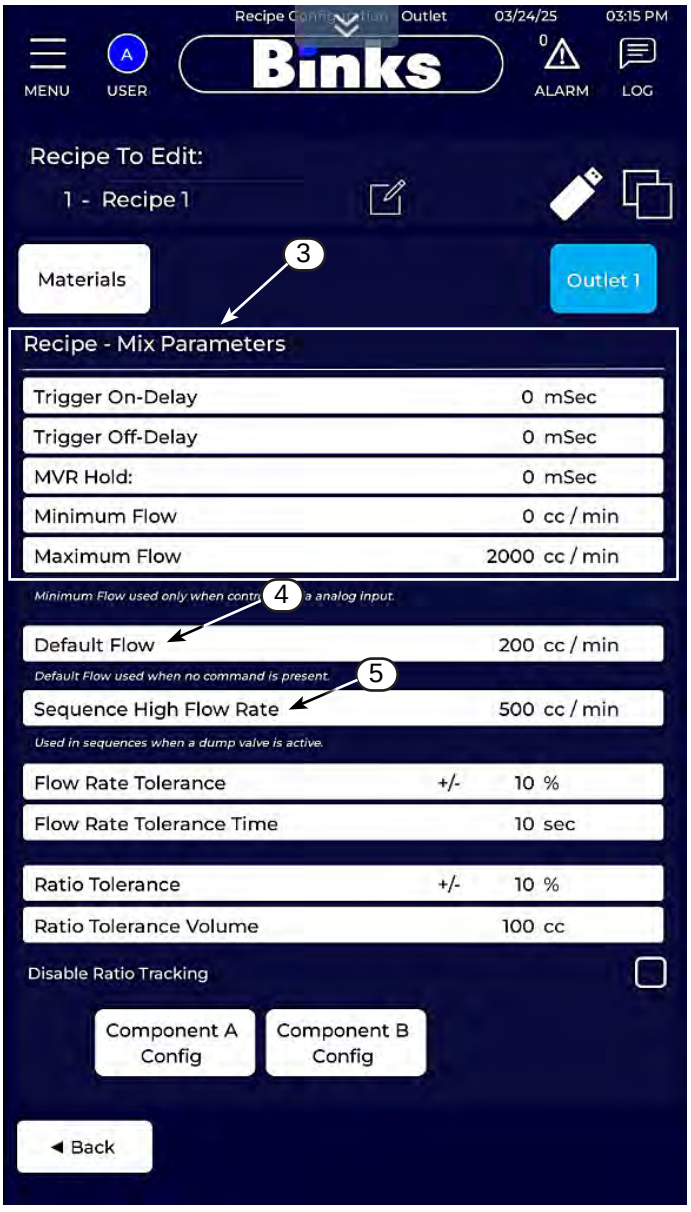


06.5.2 OUTLETS USED BY THE SELECTED STATION

Each outlet in a station has its own set of recipe parameters with adjustable mix settings. To access and change these settings:

1. Select **Recipe To Edit** (1) and choose a recipe from among the options.
2. Select **Outlet 1** (2) to open the outlet recipe screen. Only outlets configured into the system will be available. In this specific system, only one outlet is configured.
3. Under the **Recipe-Mix Parameters** screen (3), enter values for:
   a. **Trigger-On Delay**: Enter an amount of time for the trigger solenoid to delay after a trigger occurs. A trigger delay is necessary because the MVR does not open as quickly as a trigger solenoid. If the trigger solenoid opens before the MVR, the applicator may spray momentarily, then stop and start again once the MVR has opened. The trigger-on delay prevents this occurrence.
   b. **Trigger-Off Delay:** When a trigger stops, the applicator trigger solenoid remains on for a specified amount of time after the flow has shut down.
   c. **MVR Hold**: The MVR will hold at its previous value after a "trigger-off" event for this amount of time before returning to the "minimum control pressure" value. This option is available for channels that use an MVR-type controller.
   d. **Minimum/Maximum Flow**: Enter values to scale an optional analog (0-10V or 4/20mA) flow command. These parameters are used to scale the gauges on the main run screen to show the flow feedback.
4. Use **Default Flow** (4) for outlets that do not rely on a fieldbus signal or analog input to provide flow commands.
5. Users may enter a higher flow rate for when the "Max Flow" system output is active under **Sequence High Flow Rate** (5).

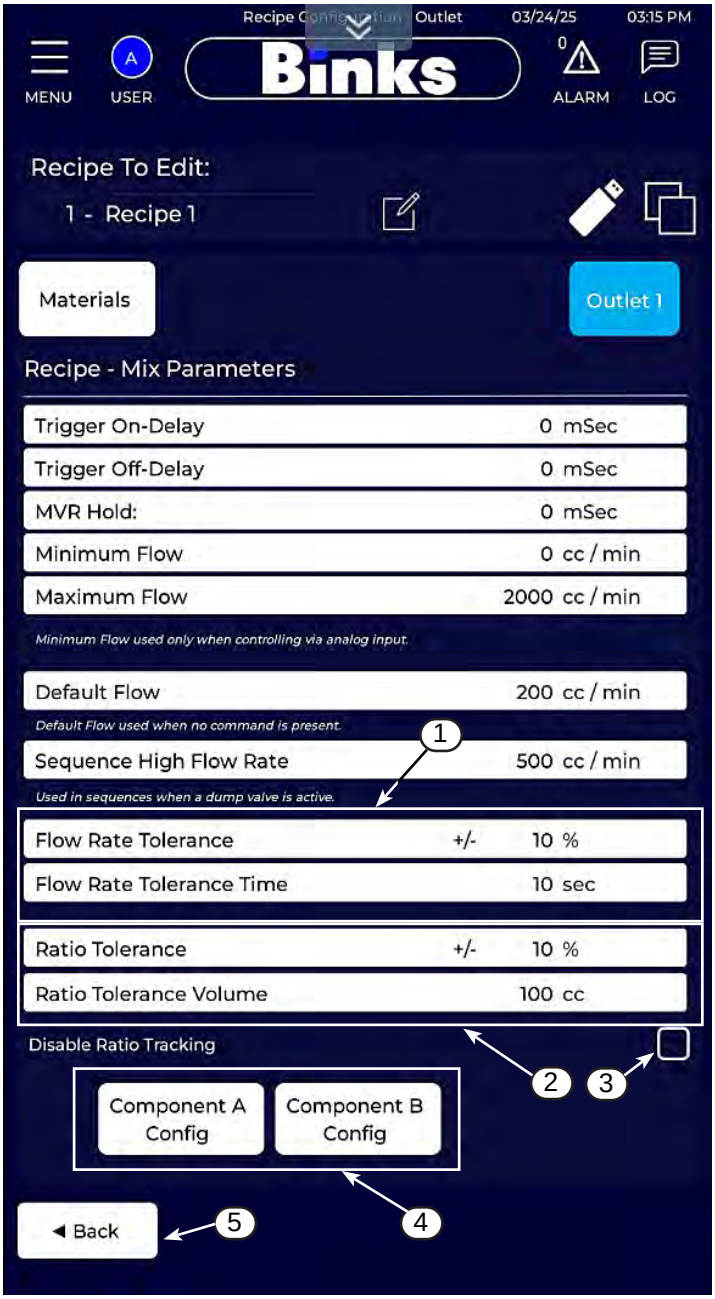




6. Enter flow rate values (1):
   a. **Flow Rate Tolerance**: The allowable percentage error in the flow rate for the outlet or any of its channels.
   b. **Flow Rate Tolerance Time**: The amount of time that the flow rate must be out of tolerance before a flow rate tolerance alarm will occur.
7. Enter ratio values (2):
   a. **Ratio Tolerance**: The allowable percentage error in the mixture ratio.
   b. **Ratio Tolerance Volume**: The volume over which the ratio is measured before a ratio tolerance alarm is activated
8. Select **Disable Ratio Tracking** box (3) to disable ratio tracking. Ratio tracking tries to correct ratio errors in automatic outlets by increasing or decreasing component B or component C flow. In manual outlets, this behavior cannot be disabled.

   Disabling ratio tracking prevents the flow command for components B and C changing from the specified amount. This function is useful in situations where very precise flow rates are needed.
9. Select a channel configuration button (4) to access the channel-recipe data located at the bottom of the outlet recipe screen.

   Review 06.5.3 Channel—Individual Fluid Channels Used By The Selected Outlet for more information on channel configuration.
10. Select **Back** (5) to return to the previous screen.



06.5.3 CHANNEL-INDIVIDUAL FLUID CHANNELS USED BY THE SELECTED OUTLET

Use the channel edit screen to make changes to recipes and their related stations, channels, and flow commands.

To access and modify the channel edit screen:

1. Select an outlet on the main recipe screen.
2. Select a channel option at the bottom of the outlet screen (1).

   The name of the channel currently being edited is displayed on the middle right corner of the screen (2).
3. Select **Recipe to Edit** (3) to change recipes. A pop-up screen opens with recipe options.
4. Enter **Flow Control** values (4). These parameters show the current settings for the hardware channel but can be changed.

   a. **Flow Calibration**: Enter pulses per liter. For quadrature flow meters, there are four pulses per flow-meter cycle. Therefore, if a flow meter is rated for 14000 cycles/liter, the pulses per liter = 56000.

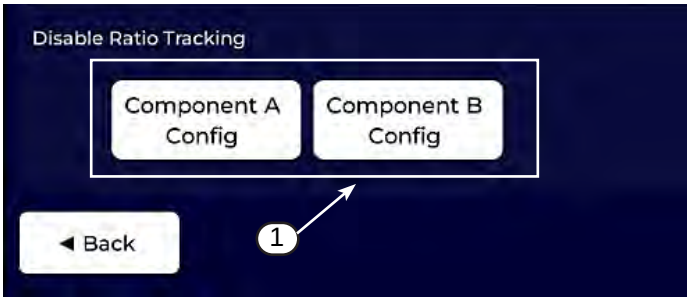
NOTICE

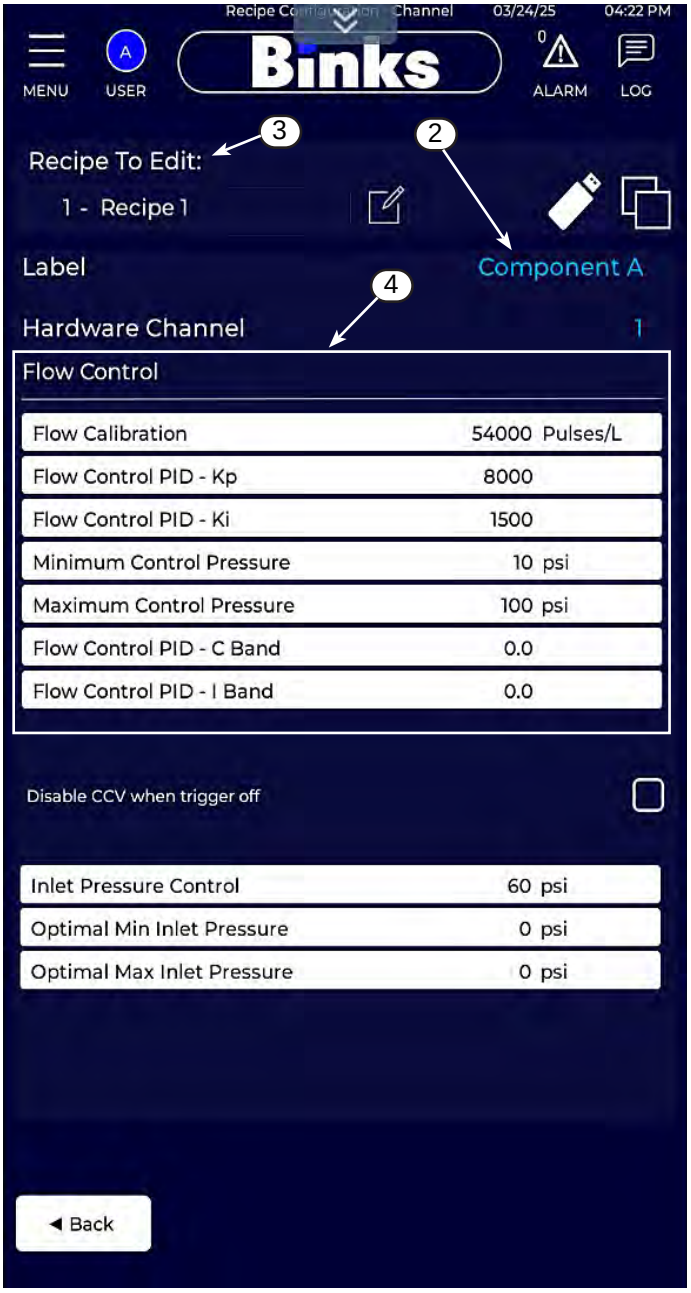
Users may choose to complete flow calibration through an automated process. This process compares a measured output of material with the counts during a calibration cycle to fine-tune the calibration for different materials.

   b. **Flow Control PID - Kp/Ki**: The P and I components of the PID govern flow control These can be adjusted slightly based on different materials and nominal flow rates. Good numbers to start with are 4000 and 600, respectively.

   c. **Minimum Control Pressure**: The lowest pressure at which an MVR pilot valve will operate. Set this value slightly below the "cracking pressure" of the MVR to give a faster response. Typically, weepless MVRs use a value of 10 psi. Weeping MVRs use a value closer to 20 psi.

   d. **Maximum Control Pressure**: The highest pressure at which an MVR pilot valve will operate. This can be used to limit material flow when triggering on.





e. **Flow Control PID - C Band** (1): Given in cc/min. If the flow rate error is greater than this value, the **Flow Control PID - Kp** value will be multiplied to give a faster response.

f. **Flow Control PID - I Band** (1): Given in cc/min. If the flow rate error is greater than this, the **Flow Control PID - Ki value** will be multiplied to give a faster response.

NOTICE

Setting C-band and I-band at 5 or 6 will suffice higher flow rate channels. For lower flow rate channels (typically catalysts), a lower setting may be used. Too low settings, however, may cause oscillations in flow rate and unstable operation. Setting C-band and I-band to zero (0) disables these features.

5. Select the **Disable CCV when trigger off** box (2) to open and close the CCV for this channel with the trigger input. The option prevents material leakage through the MVR.

   If unchecked, the CCV will remain open when the station is in run mode.

6. For systems using inlet pressure regulation, enter the pressure for channel operation in **Inlet Pressure Control** (3).

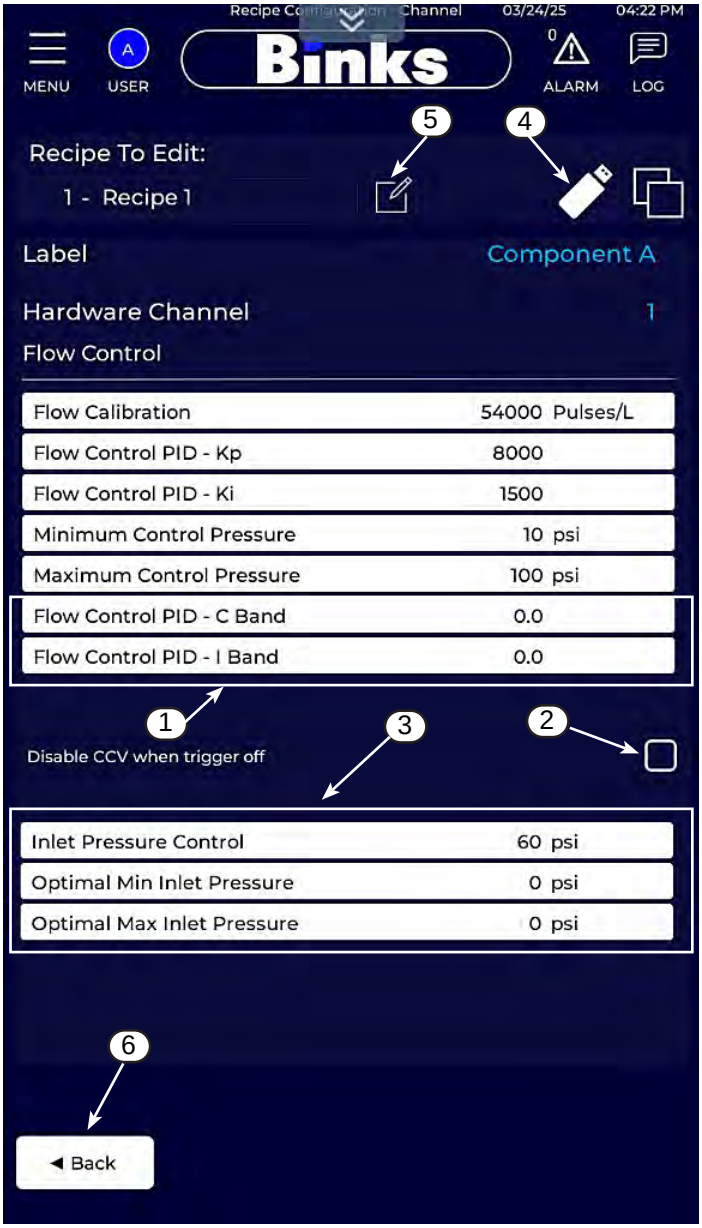
7. Enter values into **Optimal Min Inlet Pressure** and **Optimal Max Inlet Pressure** (3) to ensure inlet pressure does not exceed or fall below the optimal operating range, where the MVR is best able to control the fluid flow.

   If the maximum inlet pressure is set to a value above 0, the inlet pressure regulator will automatically adjust to keep the MVR pressure between 20 and 65 psi.

8. Select the backup/restore icon (4) to save or load the desired outlet configuration. Refer to 08.4 Backup/ Restore for more information.

9. Select the edit icon (5) to change the selected recipe's description.

10. Select **Back** (6) to return to the main outlet screen.

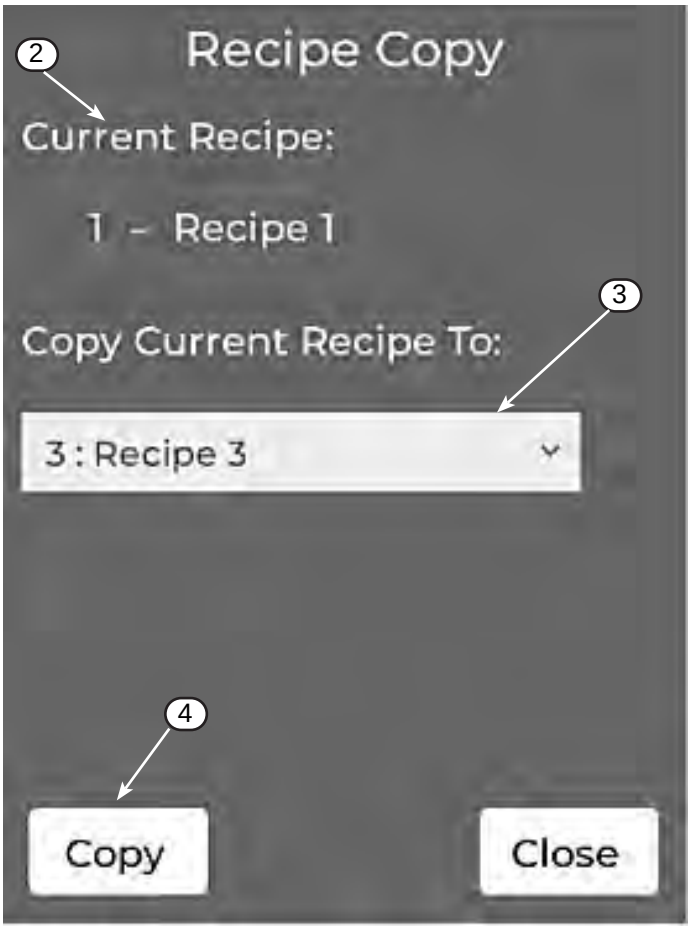


06.5.4 COPY RECIPES

To copy a recipe:

1. Select copy icon (1) to open the recipe copy screen.

2. **Current Recipe** (2) displays the source recipe—the recipe that will be copied. To change this recipe, select a new recipe in the recipe main screen.
3. Select the destination location (3).
4. Select **Copy** (4) to make a copy of all data from the source recipe to the destination.



06.6 USER MANAGEMENT

Members of the "admin" group can access functions unavailable to other users. Admins can also modify access for other users.

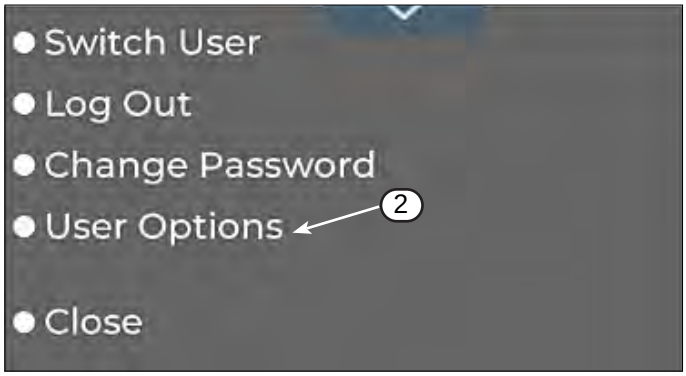
Admins have the following options:

- Edit users
- Add users
- Delete users
- Modify user permissions

06.6.1 USER OPTIONS

To access the user options screen:

1. Log in as an administrator. For more information on logging in as an administrator, including the user name and password, refer to 05.10 Log In.
2. Select **USER** (1) to open the user action menu.
3. Select **User Options** (2).



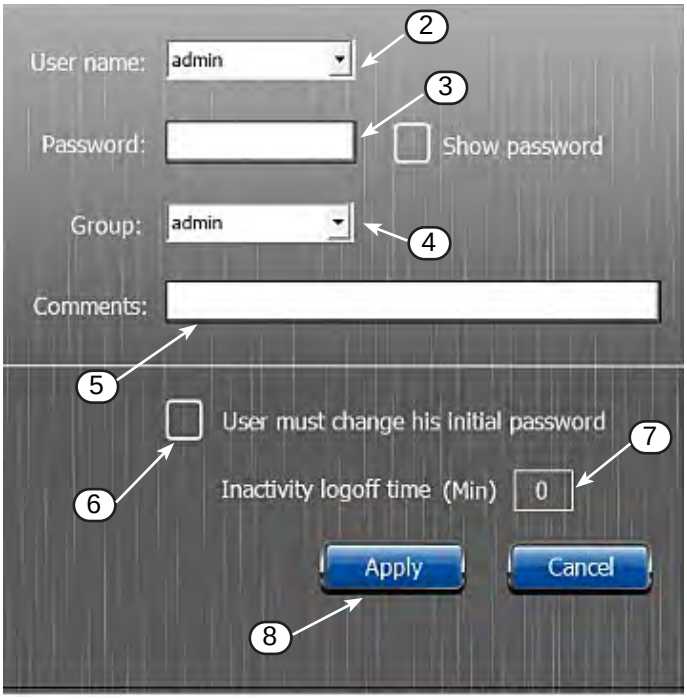
4. The screen displays the following options:
   - **Edit Users** (3)
   - **Add User** (4)
   - **Delete User** (5)

06.6.2 EDIT USER

To edit a user:

1. Select **Edit Users** (1) from the user options screen.

2. Select the user you want to edit from the **User name** drop-down menu (2).
3. Create the user's password (3). They can choose to edit this later.
4. Review the user's group assignment. Select the drop-down menu next to **Group** (4) to assign the user to a new group if necessary.
5. Enter comments in the comment box (5) if applicable.
6. Select the change password box (6) to require the user to change the initial password.
7. Set the inactivity logoff time in minutes (7).
8. Select **Apply** (8).



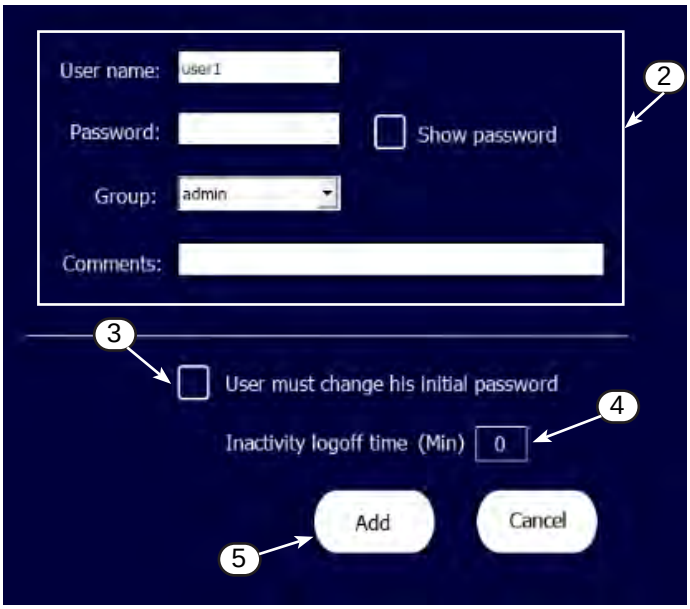
06.6.3 ADD USER

The operator interface supports up to fifty individual users.

To add a user:

1. Select **Add User** (1) from the user options screen.

2. Fill in the user parameters (2), including user name, password, group assignment, and any comments.
3. Select the box below (3) to prompt users to change the initial password.
4. Set the inactivity logoff time (4).
5. Select **Add** (5).



06.6.4 DELETE USER

To delete a user:

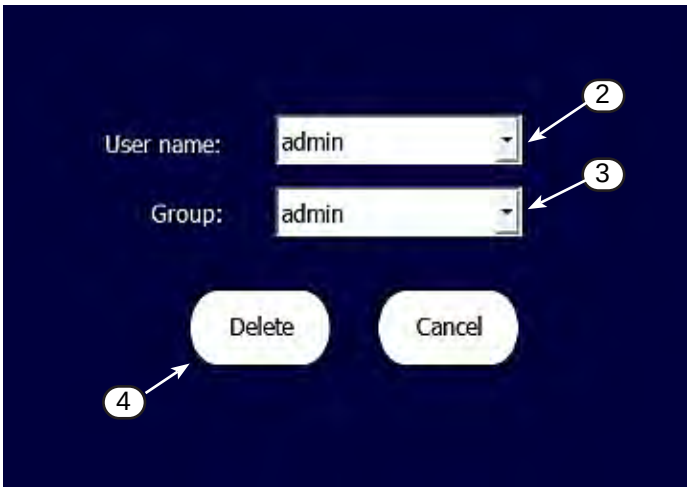
1. Select **Delete User** (1) from the user options screen.

2. Select the user you want to delete from the **User name** drop-down menu (2).
3. Select the group you want to delete the user from using the **Group** drop-down menu (3).

⚠ WARNING

Do not delete the admin user. Deleting the admin user cannot be undone. It will not be possible to log in again.

4. Select **Delete** (4).



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07 OPERATION

07.1 STARTUP GUIDE

Use the following pages as a quick reference to ensure that all electrical, air, and fluid connections to the RF2+ are complete and the machine is ready to operate.

Become familiar with the machine configuration and any options or accessories attached. Refer to 06. Configuration for information on how to set configurations and operation parameters.

07.1.1 STARTUP CHECKLIST

Before system startup, complete the following checks:

- Ensure the main power is correctly installed. For more details, refer to RF2+ Installation Manual 77-3165-1, 07.2 Power Connection.
- Ensure the frame is secured to the ground or wall and that all components are mounted securely to the enclosure, fluid panel, or mast.
- Ensure the enclosure ground stud is firmly connected to the ground.
- Ensure all energy sources are de-energized.
- Ensure all CCV signal lines are properly connected. Refer to 09. Electrical Schematics n the RF2+ Installation Manual 77-3165-1 for more information on CCV signal line connections.
- Inspect for loose wires inside the enclosure. To examine wiring, refer to the RF2+ Installation Manual 77-3165-1.

⚠ CAUTION

Do not attempt to operate the machine with loose wiring.

Once the wire examination is complete, it is safe to turn the system on.

07.1.1.1 AIR CONNECTIONS

Verify all external air connections are complete before use. Refer to 07.3 Pneumatics in the RF2+ Installation Manual 77-3165-1 with questions about air connections. Examine the following connections before use:

1. Regulated air supply to the solenoid manifold.
2. Regulated air supply to all applicators on control enclosure. Atomizing pressure is typically 20–75 psi (1.3–5 bar).
3. Regulated air supply to the color stack flushing air.
4. For systems equipped with applicator flush boxes, check:
   a. Regulated air supply to the applicator flush box(es) air connection(s).
   b. Flush box trigger signals. Trigger signals are connected to each flush box trigger input.
   c. Gun in box signal lines to all applicators for the number of installed flush boxes.
   d. Air cutoff signals from the applicator flush box to the atomizing air cutoff pilot signals.

07.1.1.2 FLUID CONNECTIONS

Ensure all fluid connections are complete before use. Refer to 07.4 Paint Materials in the RF2+ Installation Manual 77-3165-1.

5. Ensure all hardeners are plumbed to the hardener CCV stack valves.
6. Examine the connection between the solvent supply line and the color stack solvent inlet.
7. Examine the connection between the resin material supply and the color stack ports.
8. Examine the connection between the static mix tube and the outlet of the mix manifold.
9. Examine the connection between the applicator fluid line(s) and the static mix tube.
10. Energize all fluid lines. Examine fluid lines for leaks. If any leaks are present, remove pressure and repair the leak before continuing the startup procedure.
11. Where applicable, fill oil reservoirs with pump-packing lubricant. Lubricant is supplied by Binks.
12. Verify the inlet and outlet hardener pressures are correct for the application. The inlet pressure should be 2–5% higher than the outlet pressure.

NOTICE

Repair any fluid connection leaks before starting operations.

07.2 RF2+ OPERATION

07.2.1 STARTUP

To start up:

1. Locate the main disconnect switch on the right-hand side of the control enclosure (1).
2. Turn the main disconnect switch clockwise.

   This initiates the system's boot-up sequence. When the system is ready, **Main Menu** (2) will appear on the user interface display.
3. The display's default language is English. To change the display language, press the flag icon of the appropriate country or language (3).
4. Select **CONFIG SUMMARY** (4) at the bottom right-hand side of the startup screen to open the configuration summary screen.

5. The configuration summary screen (1) summarizes the hardware system configuration.

NOTICE

If the system is not configured, refer to 06. Configuration of this manual to proceed.

07.2.2 MANUAL OPERATION

Most users put the RF2+ into a process that receives automatic commands, such as trigger, flow rates, and load recipes and materials. However, the RF2+ can also be operated from the operator interface.

To operate the RF2+ from the main panel after the material has been loaded:

1. Select **MENU** (1) on the navigation bar to open the drop-down menu.
2. Select **RUN** (2) on the drop-down menu.

NOTICE

The run screen can be accessed from anywhere in the software. Select **MENU** in the navigation bar to open the drop-down menu and then select **RUN**.

07.2.2.1 STATION SELECTION

If the RF2+ is configured as a multi-station controller, the station overview screen will show the available stations whenever the run screen is first opened.

To open the station overview screen:

1. Select **RUN** from the drop-down menu (1).
2. Select anywhere on the image of the station you wish to run (2) to open the run screen for that station.

If only a single station is configured for your RF2+, the main run screen will be displayed instead of the station overview screen.

07.2.2.2 MAIN RUN SCREEN

The main run screen controls the machine's basic functions, including:

- **STOP** (1) stops the current station's machine operation. Other stations (if equipped) will continue operating.
- **START** (2) starts the current station's machine operation. Other stations (if equipped) will not change operation status.
- **RESET** (3) resets alarms on all stations.
- **Current Recipe** (4) displays the currently loaded recipe. A value of 0 (zero) indicates the system is flushed.
- Select **Change Recipe** (6) to change the recipe loaded into the station. This opens the change recipe pop-up screen. For more information on recipes, refer to Chapter 06.5. Configure Recipes.
- **Material Valve** (7) displays the material loaded into the station.

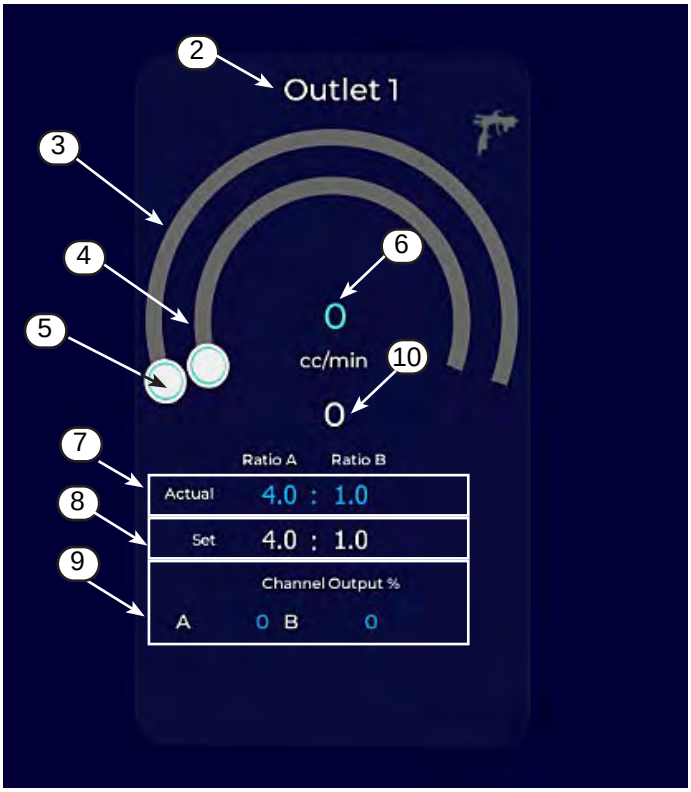
07.2.3 OUTLET INDICATORS

The outlet indicator (1) provides an overview of the run state of each outlet.

- An indicator will appear for each outlet configured to a station.
- The RF2+ displays a maximum of four outlet indicators on the run screen. An arrow will appear under the first four indicators when more than four are configured. Select the arrow to view the additional outlet indicators.

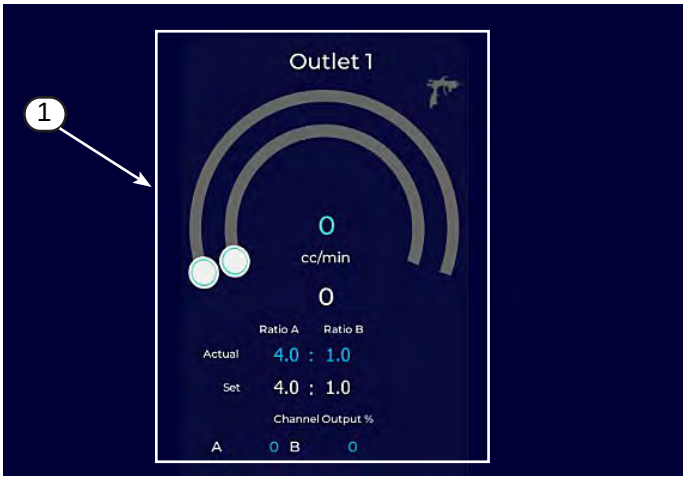
Indicator components include:

- Components A, B, and C are represented by the arches underneath the outlet number (2).
  - The first arch (3) represents component A.
  - The second arch (4) represents component B.
  - A third arch is available when a third component is configured for the system.
- The circle outlines on each arch represent the set flow rates, and the circles represent actual flow rate—material flow in real-time during operation. When the actual flow matches the set rate, the circles appear filled in (5).
- Outlet actual flow (6) displays the numerical value for the material flow rate in real-time during operation.
- **Actual** (7) displays the ratio of materials in use.
- **Set** (8) displays the user-specified ratio of materials.
- **Channel Output %** (9) shows the percentage of components A and B in the fluid flowing from the outlet.
- Outlet flow setup (10) is a numerical display of the user-specified set point. This does not display for manual outlets.



07.2.4 OUTLET DETAILS

Select the outlet indicator (1) to open the outlet details pop-up screen.



This screen shows the details of the selected outlet, including:

- The trend graph (2) shows flow rate over time.
- **Active Job Settings** (3) displays active jobs relevant to the outlet. These settings are the same as the settings in the recipe editor screen. These fields will be read-only unless the user has administrative access.
- **Override** (4) overrides all other flow commands with the default flow value. When active, the background will turn from white to yellow. The override can only be turned on and off manually and will persist between color changes.
- **Trigger** (5) buttons allow users to manually trigger applicators for automatic outlets. A button will appear for each trigger output configured to an outlet. Up to four triggers can be configured for an outlet.

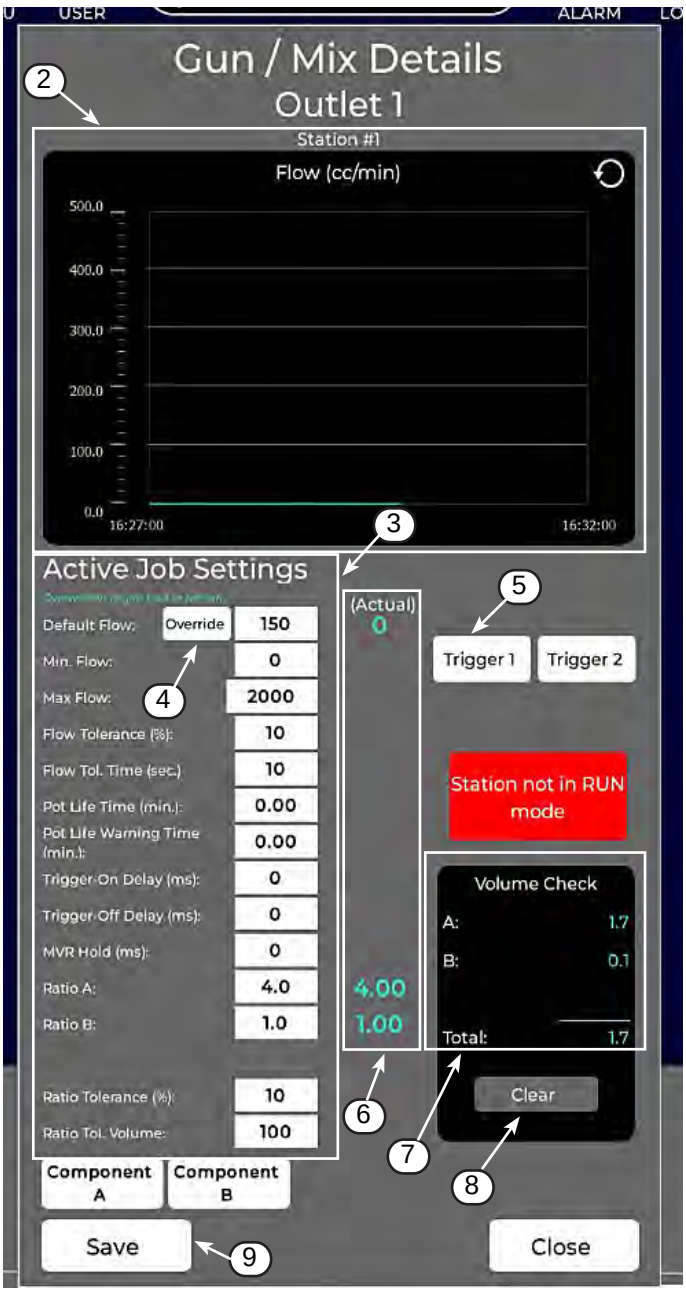
NOTICE

If multiple triggers are active simultaneously, the flow rate for the outlet will be the command multiplied by the number of active triggers.

NOTICE

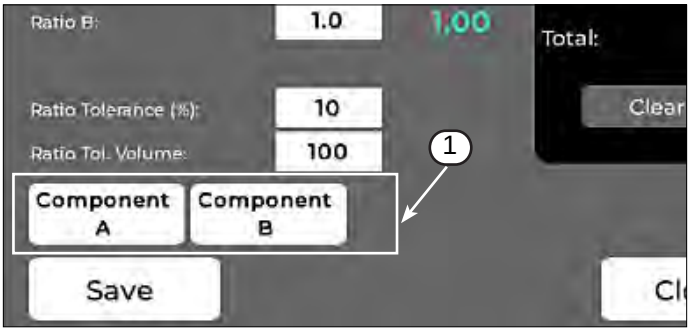
Only triggers assigned to the outlet are visible on this screen. In most cases, only one trigger will be configured.

- The actual status information (6) section for the outlet shows the flow rate and **Ratio A** and **Ratio B** values.
- **Volume Check** (7) displays the current flow totals for materials A and B in cc or mL. Select **Clear** (8) to reset the totals when not triggered. These totals reset automatically when the recipe is changed.
- Select **Save** (9) to save changes to the currently loaded recipes. Unsaved changes will be lost at the next recipe change.



07.2.5 CHANNEL DETAILS

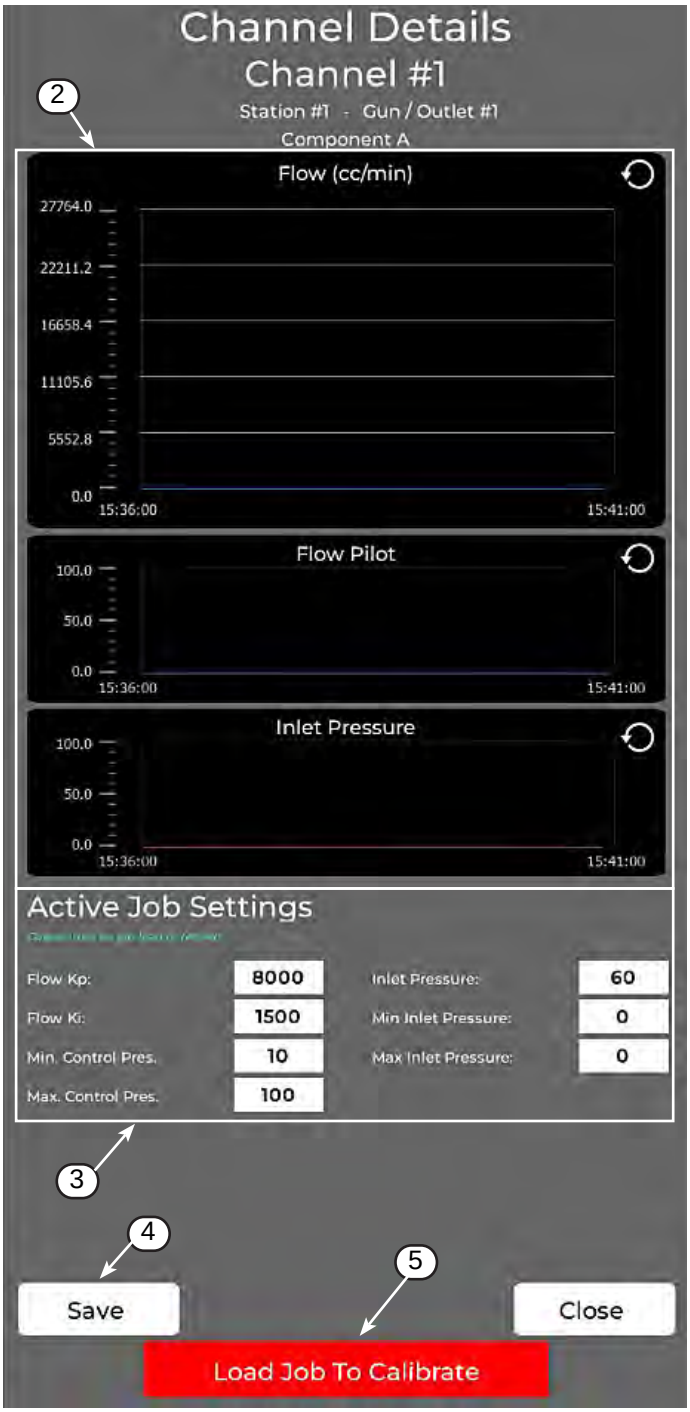
Select **Component A** or **Component B** (1) on the outlet details screen to view channel details for the selected component.



The channel details screen includes:

- The trend graphs (2) for tracking flow rate, pilot psi, and inlet pressure over time.
- **Active Job Settings** (3) contains relevant settings for the channel.

  The fields shown here are the same fields found in the recipe editor screen in Chapter 06.5. Recipes.
- **Save** (4) saves changes to the currently loaded recipes. Unsaved changes will be lost.
- **Load Job to Calibrate** (5) opens the flow meter calibration screen to adjust the flow meter used for each material run through the machine.



07.3 LOAD MATERIALS

07.3.1 LOAD RECIPES

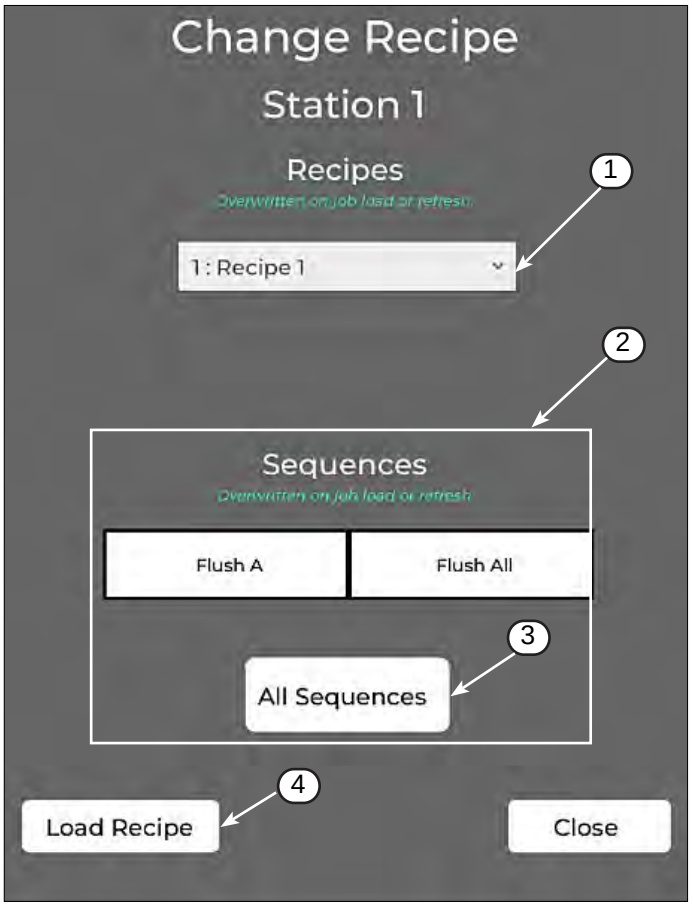
Recipes can be loaded from the operator interface of the RF2+.

To load a recipe from the operator interface:

1. Select **RUN** from the drop-down menu (1) to navigate to the main run screen.
2. Select **RESET** (2) to clear active alarms or troubleshoot as necessary.
3. If the RF2+ has been configured for multiple stations, select the applicable station.
4. Select **START** (3) to place the station in a run state. The button text will change to **RUNNING**.
5. Select **Change Recipe** (4) to open the change recipes screen.

> **NOTICE**
>
> The system must be started before **Change Recipe** is pressed. The RF2+ will prompt users to place the station into run mode if it is not already in run mode.

6. Select the appropriate recipe from the **Recipes** drop down-menu (1).
7. **Sequences** (2) displays the sequence steps configured to the selected recipe. Operators may choose one of the two sequences or select **All Sequences** (3) to view additional sequences available for the selected recipe.



NOTICE

The sequence shown in the image are examples only. Actual sequence selections depend on the user's configuration.

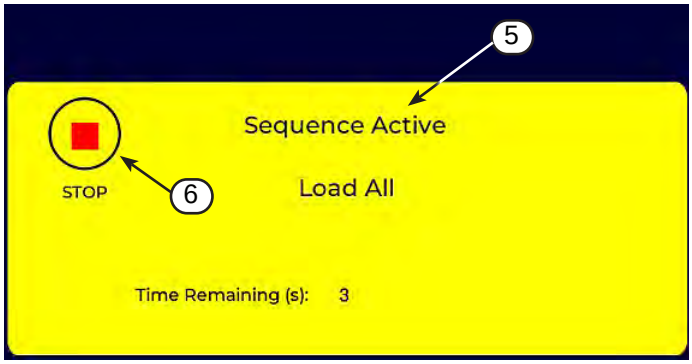
8. Select **Load Recipe** (4) to start the load sequence.

9. When the load recipe process starts, the station will automatically determine if a flush is needed before it runs the load sequence.

   Once a flush has completed, then the system runs the appropriate sequences to load material.

   When this happens, **Sequence Active** (5) will appear at the bottom of the main run screen.

   START, **RESET,** and **Change Recipe** will be unavailable during this time. However, **STOP** (6) is available on the sequence tray during this time.



10. When the load sequence is complete, the material is loaded, the station is in a run state (7), and the system will respond to trigger and flow commands for configured outlets for the station.

07.3.2 CHANGE COLORS

To change colors, follow the same steps as loading a recipe from a flushed state.

If the new recipe requires the same color numbers, no flush will be performed, and the system will go directly to the new recipe load sequence.

If component A is different, the system will call the flush A only sequence from the last recipe.

If component B or C is different, the system will call the flush all sequence from the last recipe.

NOTICE

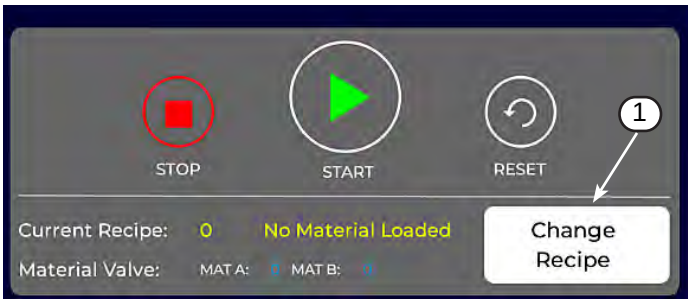
The flush sequences are called from the settings of the last recipe, while the load sequence is called from the settings of the new recipe.

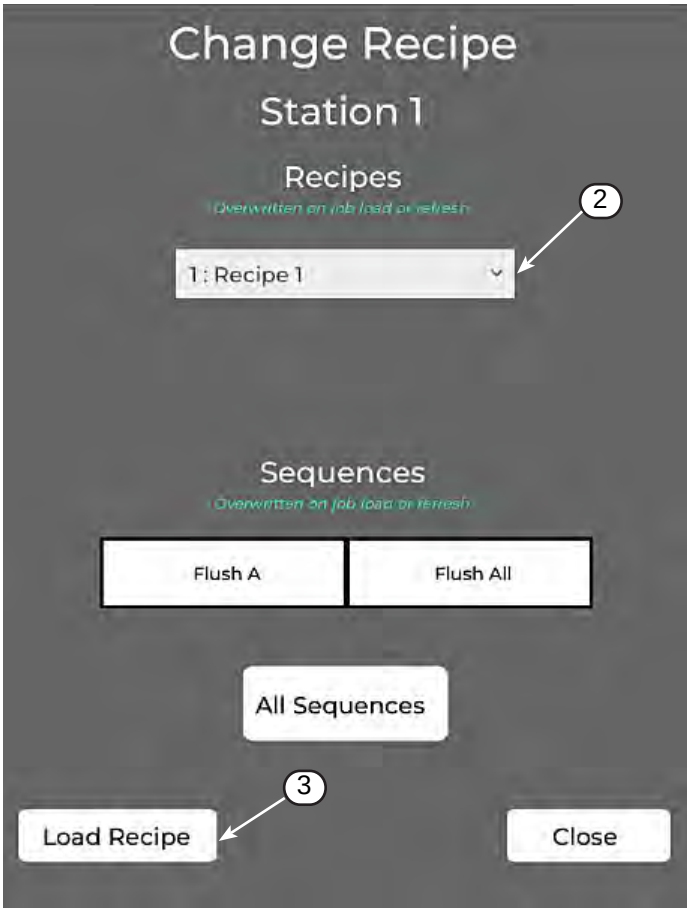
To change colors:

1. Select **Change Recipe** (1) to open the recipes screen.
2. Select the appropriate recipe from the **Recipes** drop-down menu (2).
3. Press **Load Recipe** (3).

NOTICE

If an applicator flush box is used, make sure the applicator is in the box and the lid is closed. If a color is loaded or flushed without an applicator flush box, make sure air atomization is turned off and trigger the material into a grounded metal waste container.





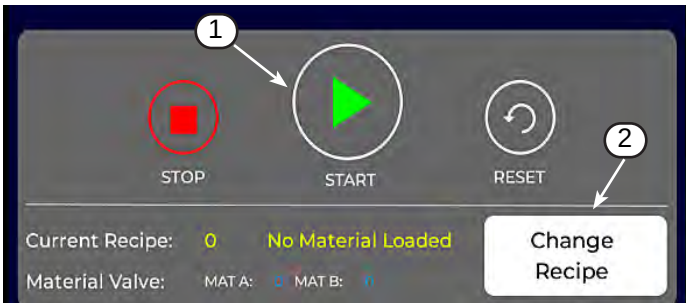
07.4 SHUT DOWN SYSTEM

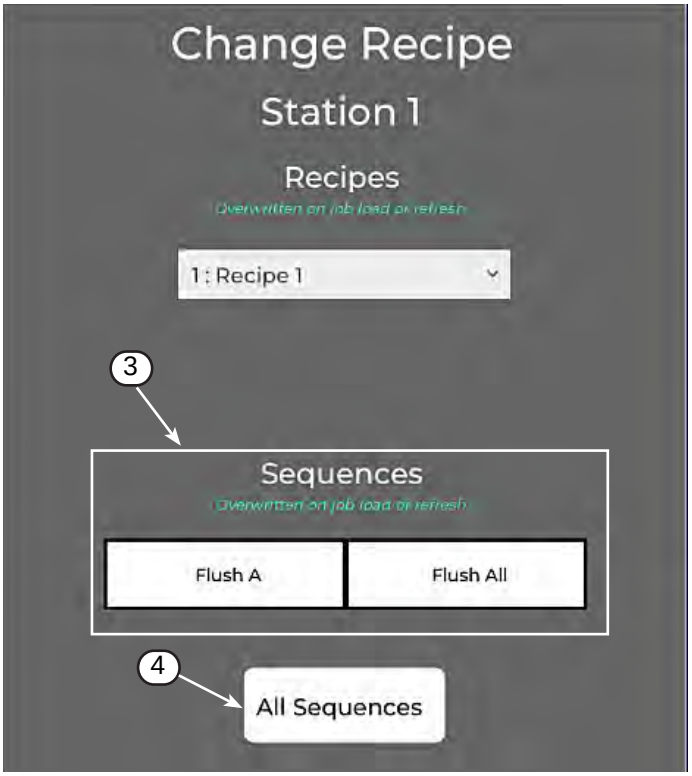
Before the system is shut down, purge any material remaining in the tubing to prevent clogs in the fluid tubing and other fluid components.

All recipes have a designated "purge all" sequence. When the supervisory controller calls a purge command, the system will run that sequence.

To purge material from the system:

1. Select **START** (1) to place the station in run mode.
2. Select **Change Recipe** (2).
3. Select the desired purge sequence (3). If the purge sequence is not listed directly under Sequences, select **All Sequences** (4) to refer to the complete list of available sequences.
4. The selected sequence will start and the sequence status pop-up screen will open.





⚠ CAUTION

Always shut down the RF2+ with solvent-loaded fluid lines after flushing. Residual air or material in the system may cause clogs or stuck system components.

5. After the purge sequence has been completed, you can proceed to shut down the system with the main disconnect switch (5) on the right of the system's enclosure.

   The front panel E-Stop button does not remove AC power from the system. Only the red main disconnect switch on the right side of the controller shuts off power.

07.5 FLOW METER CALIBRATION

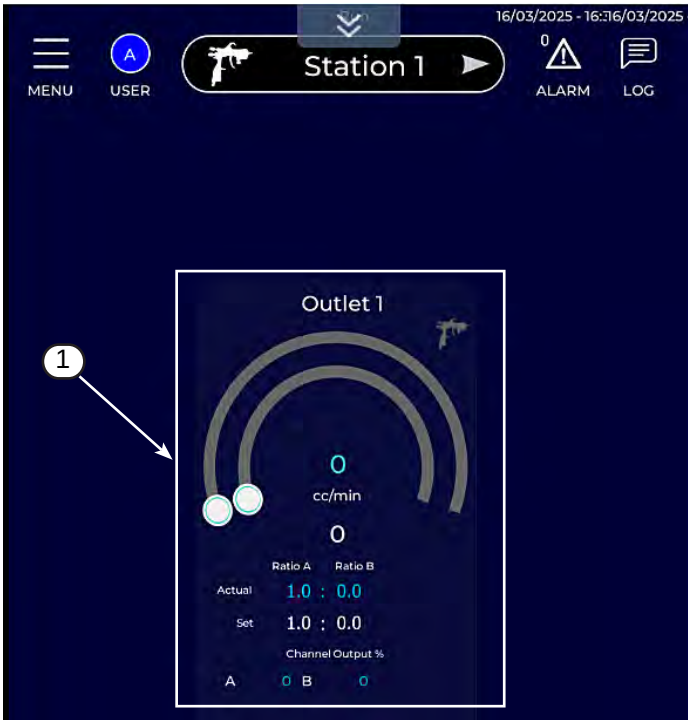
Calibrating the flow meter is necessary for the best ratio performance of the RF2+. Calibration is recommended for each material used because materials of different viscosities may cause the gears within a flow meter to turn more or less than others.

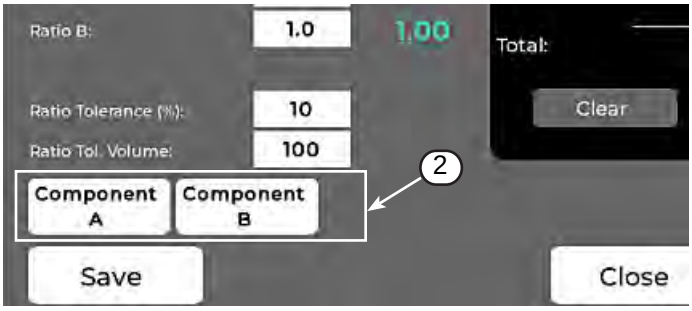
At low flow rates (less than 100 cc/min), the flow meter's operation depends on the flow rate. It is recommended that the material be calibrated at close to the process's nominal flow rate.

Calibration data is stored in recipe data. The calibration screen may be accessed from the recipe edit screen or the channel detail pop-up screen, which can be accessed from the main screen.

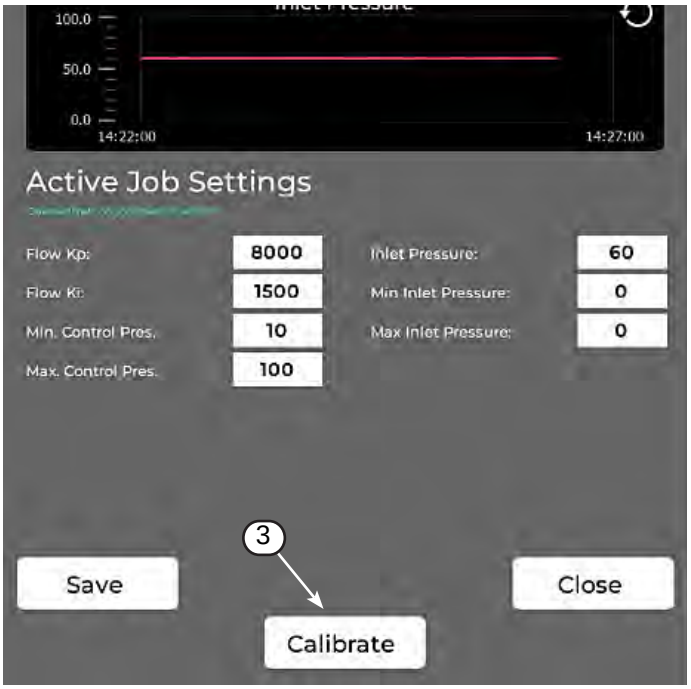
To calibrate a flow meter:

1. Load a recipe/material into the system.
2. Access the calibration screen through the channel configuration screen. To access the screen through channel configuration:
   a. Select the appropriate outlet from the main run screen (1).
   b. From the outlet details screen, select the appropriate channel (2).





   c. Select **Calibrate** (3).
3. Place a cup under the calibration port for the channel being calibrated to catch material flowing from the port.



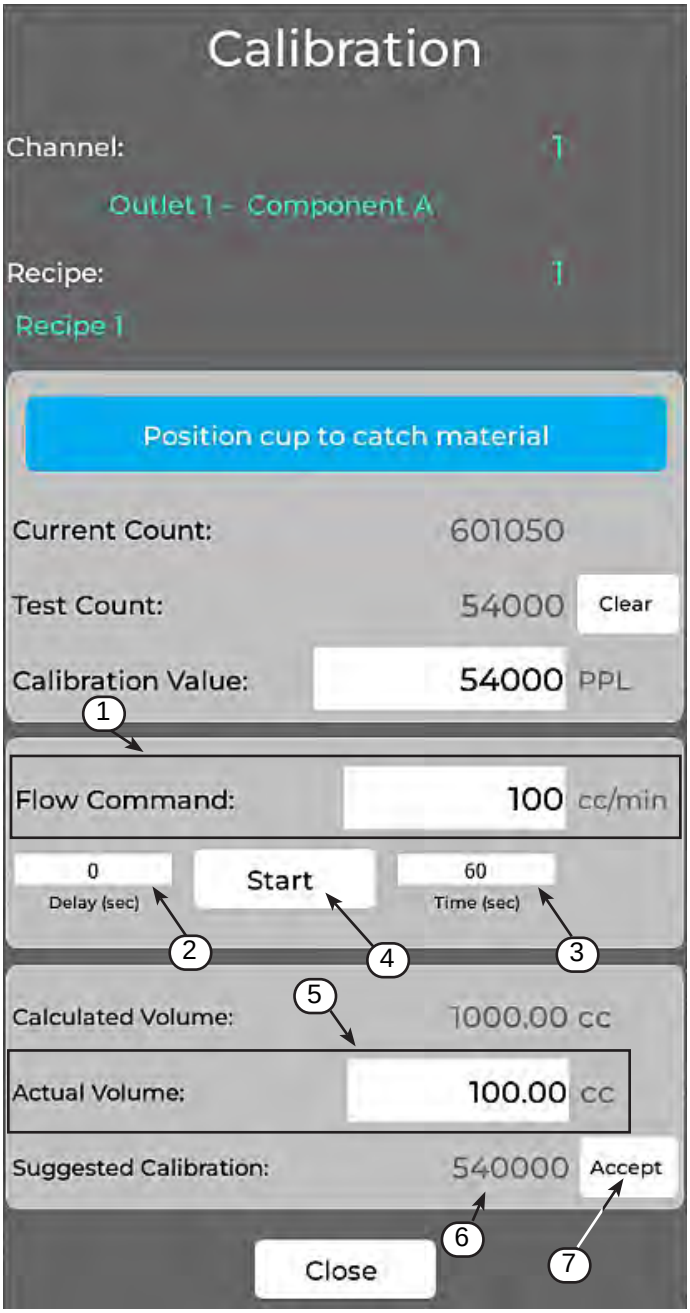
4. Set the **Flow Command** value (1). The flow command will be given to the flow control device during the calibration process. The recommended flow rate is the same rate expected during use.
5. If desired, set a delay time (2). The delay time allows the user time to position the beaker under the calibration port.
6. Set a time for the calibration port to remain open (3).
7. Press **START** (4). The calibration port will open for the set amount of time and material will flow from the calibration port for the duration of the calibration time.

   If users choose to set a delay time, the calibration port will remain closed until the delay time has elapsed.
8. When the calibration is complete, enter the measured amount of material into the **Actual Volume** field (5). Based on the number of flow-meter pulses counted and the actual volume entered, a suggested calibration (6) will be calculated.
9. Press **Accept** (7) to accept the suggested calibration as the calibration value.

NOTICE

Save the current recipe settings in the outlet or channel screens to ensure the suggested calibration value is not lost. The suggested calibration is not automatically saved to the current recipe.

Alternatively, the calibration value can be directly entered from this screen. Changes made to the calibration are stored in the recipe parameters for the recipe loaded into the system.



07.6 PULSE VALVE ADJUSTMENT

A pulse valve is a specially designed solenoid valve used to deliver extremely fast pulses. These valves operate using air pressure to open or close and use the same air supply that controls the system.

The duration that the valve remains open determines the amount of material that will flow through it. This duration is measured in percentages and referred to as the pulse valve duty cycle. The duty cycle value is displayed on the touchscreen **Channel Output %** indicator (1).

It is important for the pulse valve to operate within its optimal range. This optimal range allows the valve to remain open for longer periods to facilitate greater flow and correct high-ratio errors. Conversely, it also allows for shorter open periods to limit material flow and correct low-ratio errors.

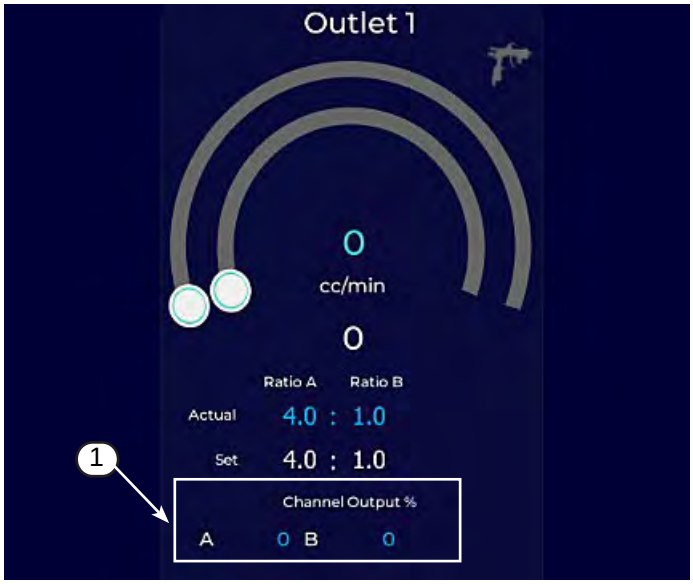
If the pulse valve is out of its optimal range, a screwdriver icon (2) will appear underneath the outlet status indicator.

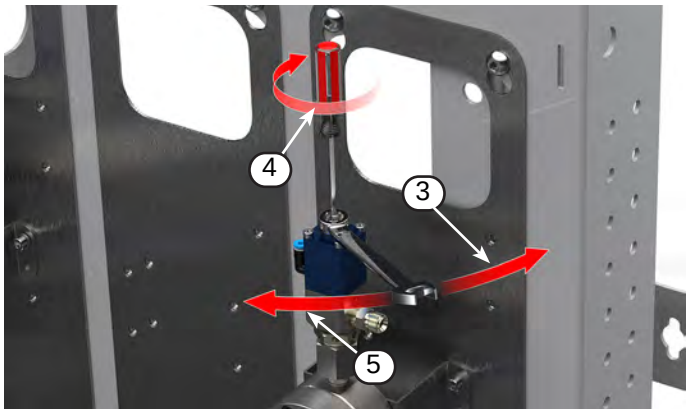
To adjust the pulse valve:

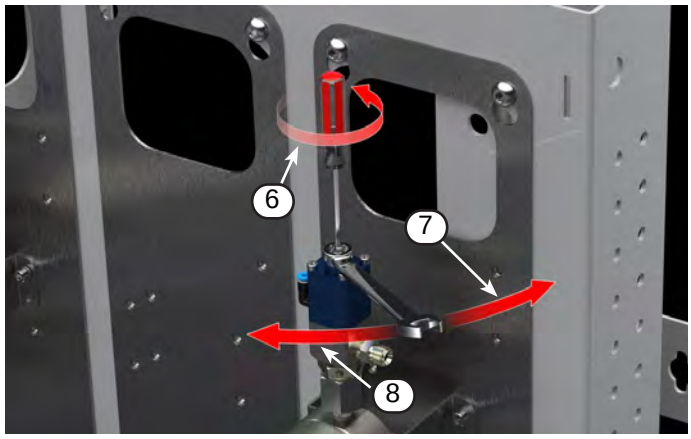
1. Verify that the system is loaded with the materials used in normal operation and the flow rates are similar to those used in normal operation.
2. Locate a 13 mm wrench.
3. If the channel output is below 10%:
   a. Turn the wrench counterclockwise (3) to loosen the jam nut on the adjustment screw.
   b. Turn the adjustment screw clockwise (4) until the channel output percentage increases.

      If the screw is turned to the clockwise limit, material flow will stop. If the valve must be operated close to this limit to achieve the optimal range, Binks recommends reducing the inlet pressure.
   c. Use the screwdriver to hold the adjustment screw in place, then turn the wrench clockwise (5) to set the adjustment screw in position.
4. If the channel is above 90%:
   a. Turn the wrench counterclockwise (6) to loosen the jam nut on the adjustment screw.
   b. Turn the adjustment screw counterclockwise (7) until the channel output percentage decreases.

      If the screw is turned to the counterclockwise limit and the optimal range cannot be reached, it may be necessary to increase the inlet pressure.
   c. Using the screwdriver, hold the adjustment screw in place. Then turn the wrench clockwise (8) to set the adjustment screw in position.







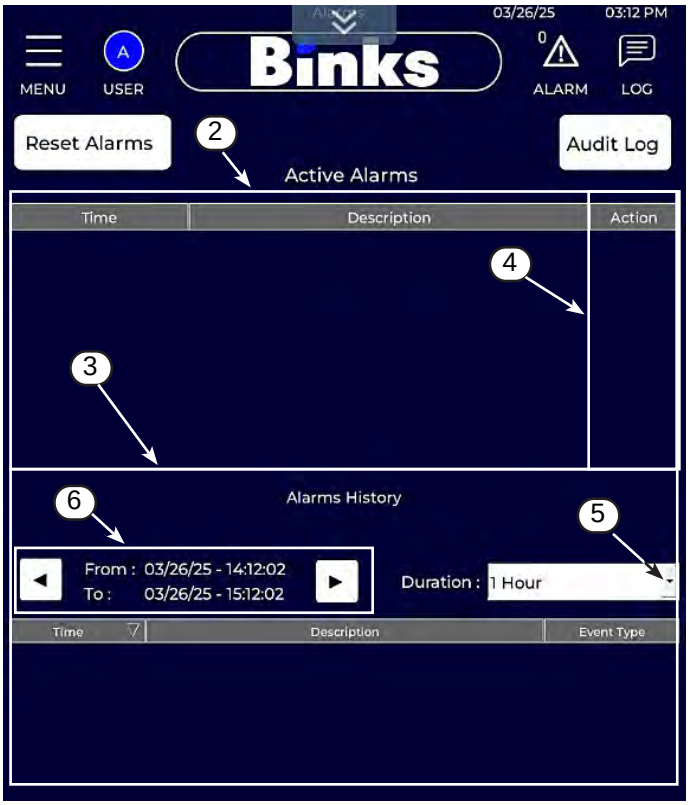
07.7 ALARMS

07.7.1 ALARMS SCREEN

On the main navigation bar, the **ALARM** icon (1) changes color and shows an alarm count if an alarm is present.

Press the **ALARM** icon to open the main alarm screen.

In the main alarm screen, the top list (2) shows active alarms. This example has no active alarms. The bottom list (3) shows historical alarms.



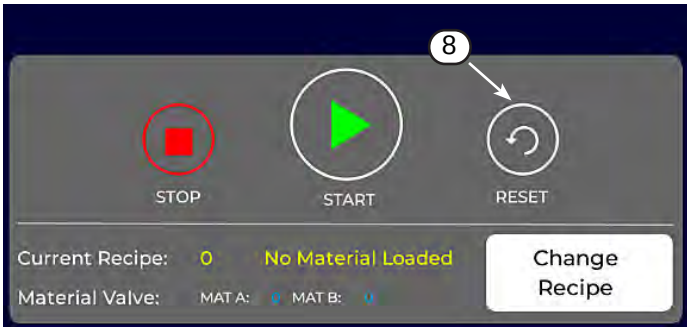
For more alarm details:

- The right side of any row in the active alarms list that contains a button under the Action column (4).
- Press this button to open the alarm detail pop-up screen. The alarm detail pop-up screen contains a list of conditions that may cause the indicated alarm and, on a separate tab, a list of potential corrective actions.
- In the historical alarms list, the duration of the list can be selected through the **Duration** drop-down field (5)
- Press the backward and forward arrows (6) to change the time period and date of the list of historical alarms.

To reset an active alarm:

1. Press **Reset Alarms** (7) on the main alarm screen, or press **RESET** on the main run screen (8).

   Once an alarm condition is resolved, the alarm will clear from the list and will then be shown only in the historical alarm list.



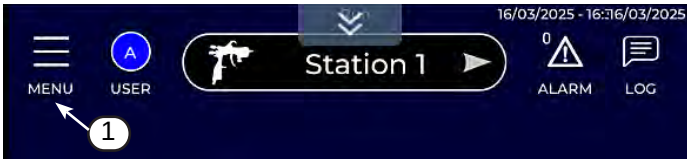
07.7.2 ALARM MASKING

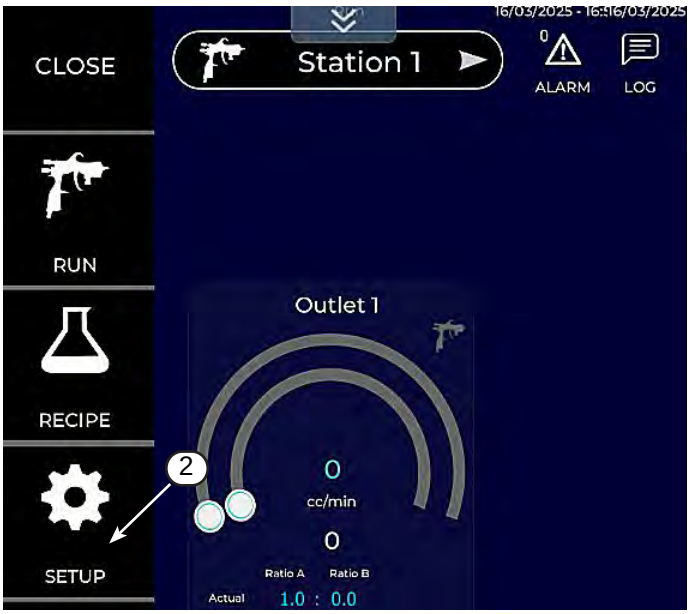
Alarm masking allows various alarms to be used as a "spray-shutdown" that halts the system or warnings only

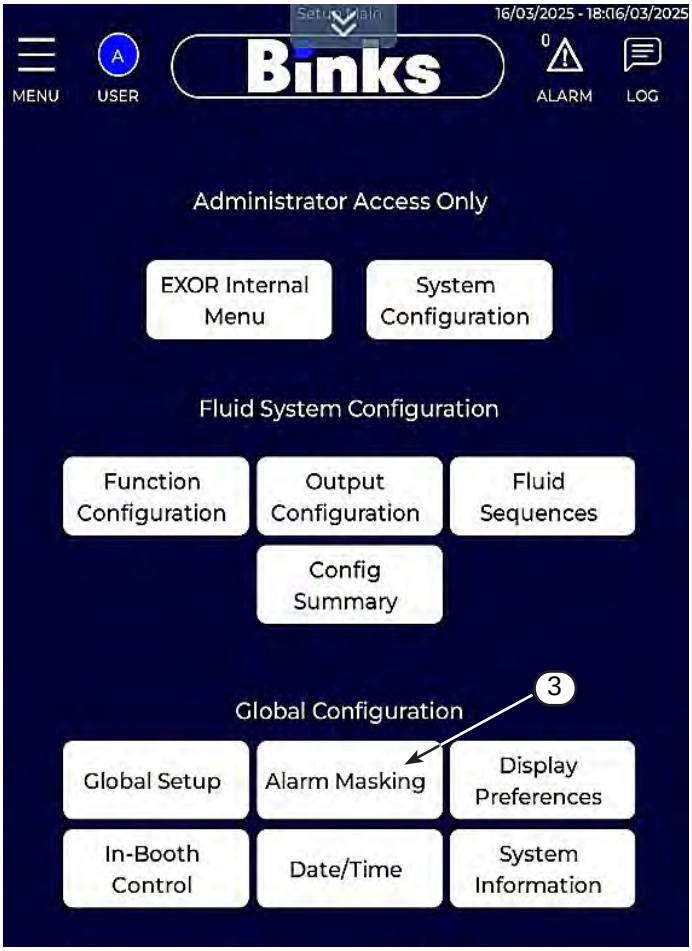
Additionally, the system alarms can trigger the system to shut down the spray operation. If deselected, they will provide a warning while the system continues to run.

To mask alarms:

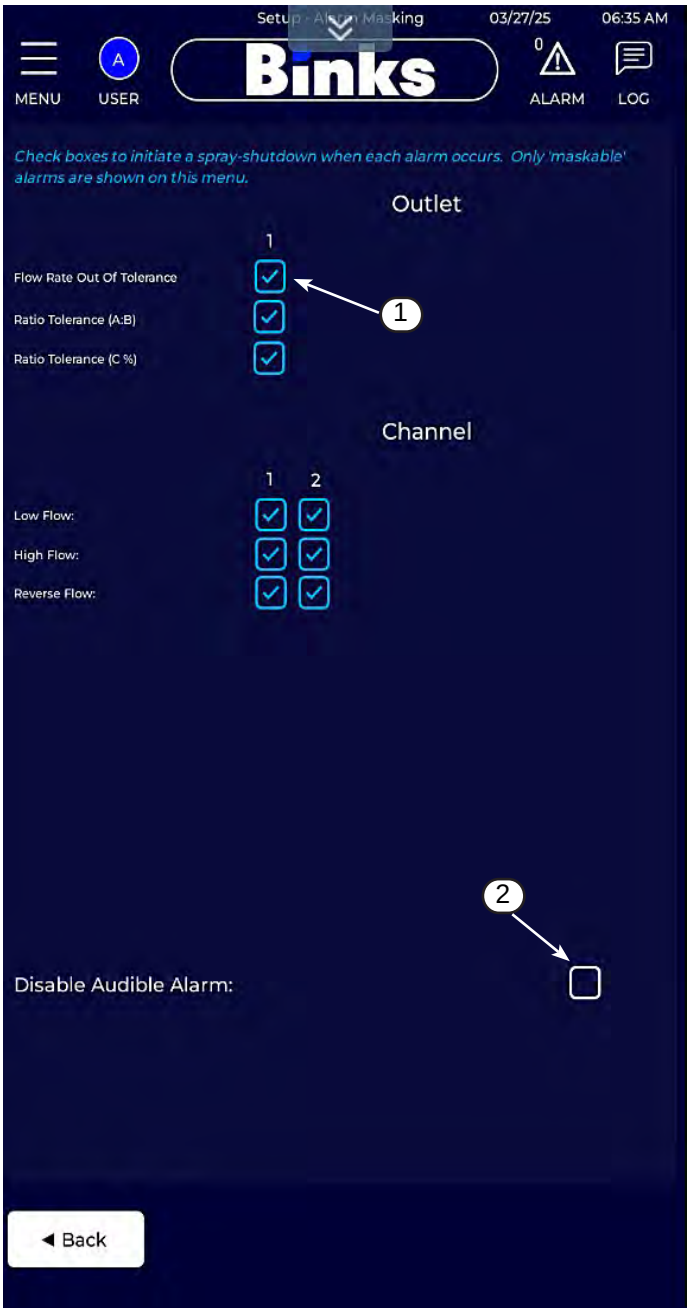
1. Navigate to the alarm masking screen.
   a. Select **MENU** (1) from the main navigation bar.
   b. Select **SETUP** (2) from the drop-down menu.
   c. Select **Alarm Masking** (3) from the main setup menu.







2. Not all available alarms are shown in the alarm masking screen, as some alarms will always result in spray shutdowns or warnings.
3. Check the box next to an alarm (1) to initiate a spray-shutdown when the alarm is triggered. A check mark will appear in boxes when selected.
4. Selecting **Disable Audible Alarm** (2) will disable the alarm horn chirps when an alarm is activated.



07.7.3 POT LIFE ALARMS

The majority of alarms will shut down the system and can be cleared when the reset button on the main run screen is pressed.

An expired pot life, however, requires a system flush to reset system operation.

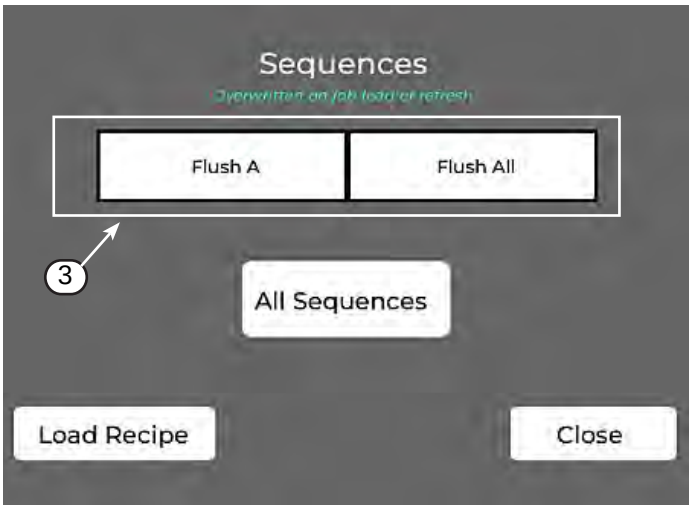
When a pot life warning occurs, the system will remain in run mode, but the CCV valves will close and cause the material flow to stop. If an outlet is in the middle of a spray operation when a pot life fault is issued, it will trigger a shutdown alarm.

Therefore, it is imperative to take appropriate action when you receive an expired pot life notification because such a warning will immediately halt the system's spray operation.

Pot life can only be reset through a system flush of the expired material. The system must either enter or stay in the run state. For the appropriate flush sequence, refer to 06.3.2.2 Sequence Settings.

To reset pot life:

1. Reset other alarms if present by pressing **RESET** (1) on the main run screen.
2. Open the sequences tray and select **Change Recipe** (2) from the main run screen.
3. Select **Flush A** or **Flush All** (3) to flush out the pot life timers of all outlets on the affected station.
4. Reload the station as described in 07.3.1 Load Recipes.



07.7.4 MANUAL OVERRIDE/LOCAL FLUID CONTROL-ACTIVE

The manual override function allows users to access individual functions and outputs for maintenance and troubleshooting tasks.

To use manual override:

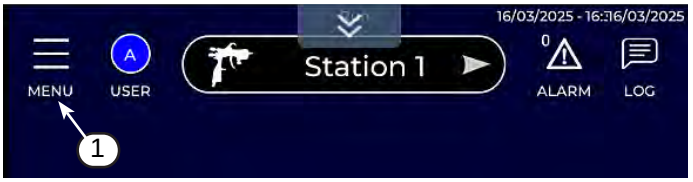
1. Select **MENU** (1) from the main navigation bar.
2. Select **MANUAL** (2) from the main drop-down menu. This opens the local fluid control screen.
3. Select **Manual Override** (3) to operate functions manually. The button will turn yellow, and the applicator icon at the top of the screen (4) will change to show a hand. This indicates the manual override is active.
4. Select the button (5) to the right of any listed function.
5. The output status indicator (6) will show the status of each solenoid.

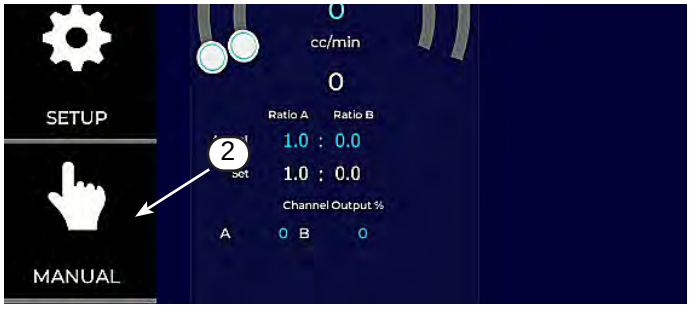
NOTICE

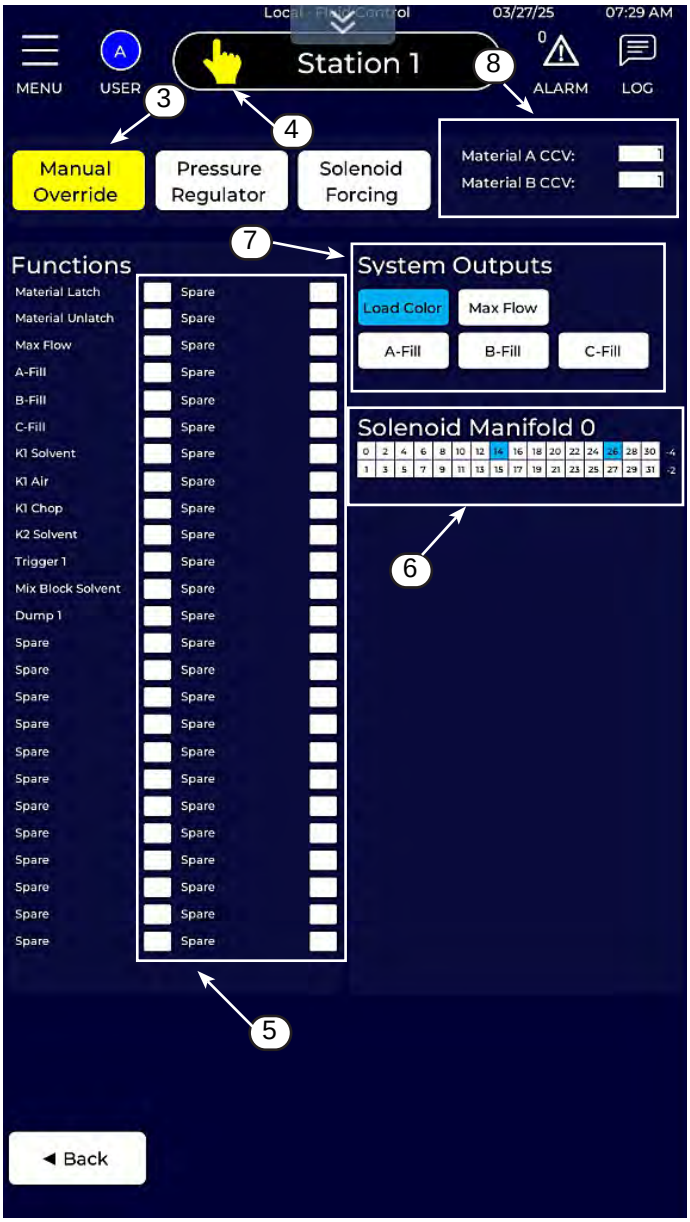
Configured output interlocks are not available in manual mode, and it is possible to turn on two solenoids at one time from this screen.

6. Select any of the **System Output** buttons (7) to turn on and off the system functions for the currently assigned station.
7. When the manual override is active, the color valves (8) can be selected.

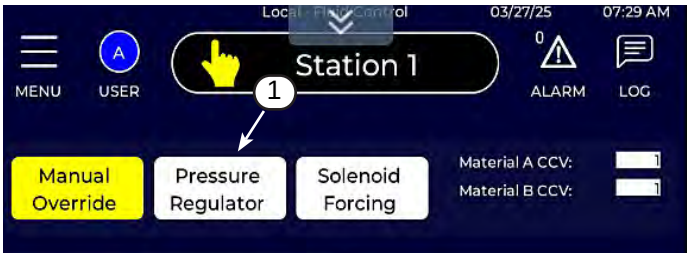
   Depending on your system's configuration, the following options may be available: **Material A CCV**, **Material B CCV**, and **Material C CCV**.



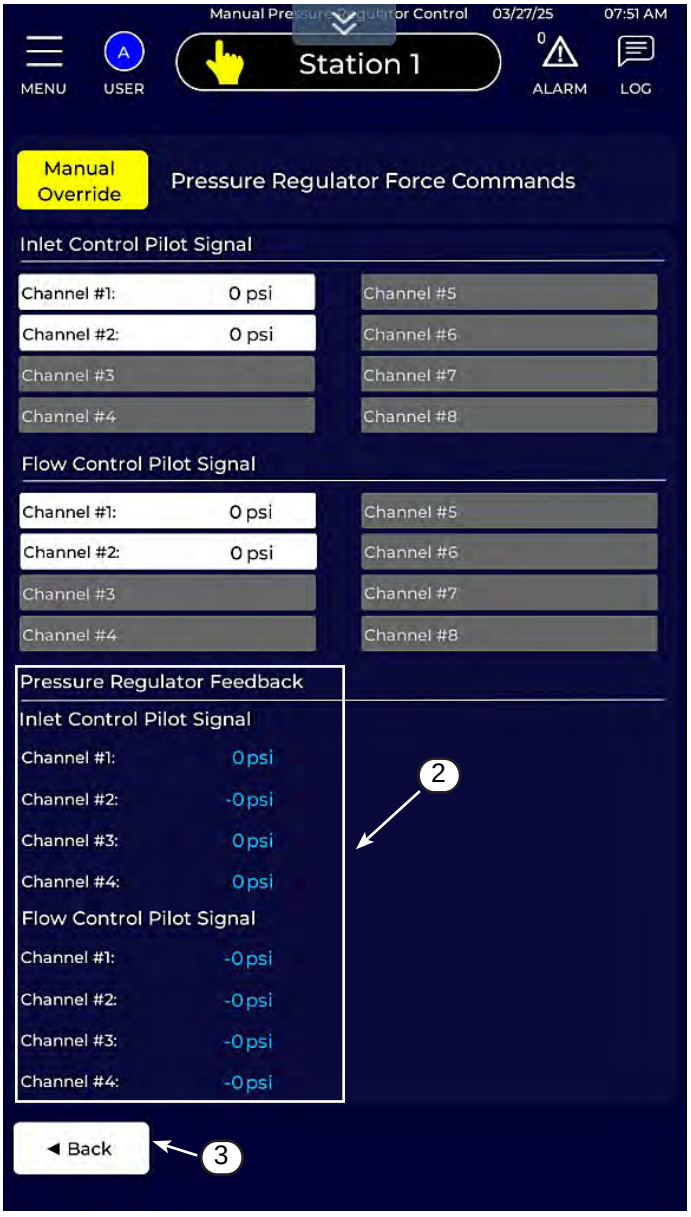




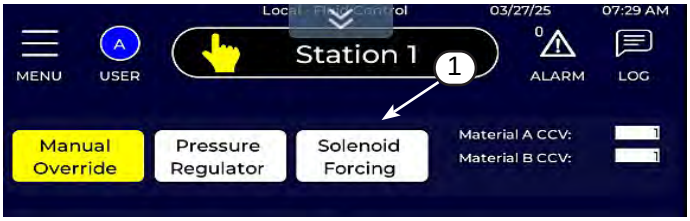
8. Select **Pressure Regulators** (1) on the local fluid control screen to open the pressure regulators screen.



9. From this screen, manual override mode can be activated and deactivated, and all configured pressure regulators can be operated manually. The actual pressure output value for each regulator is shown at the bottom of the screen (2).
10. Press **Back** (3) to return to the local fluid control screen.



11. Select **Solenoid Forcing** (1) from the local fluid control screen to open the solenoid forcing screen. This screen is only available if a manual override is selected.



12. Pressing the button to the right of the output description (2) forces the installed solenoid on or off.

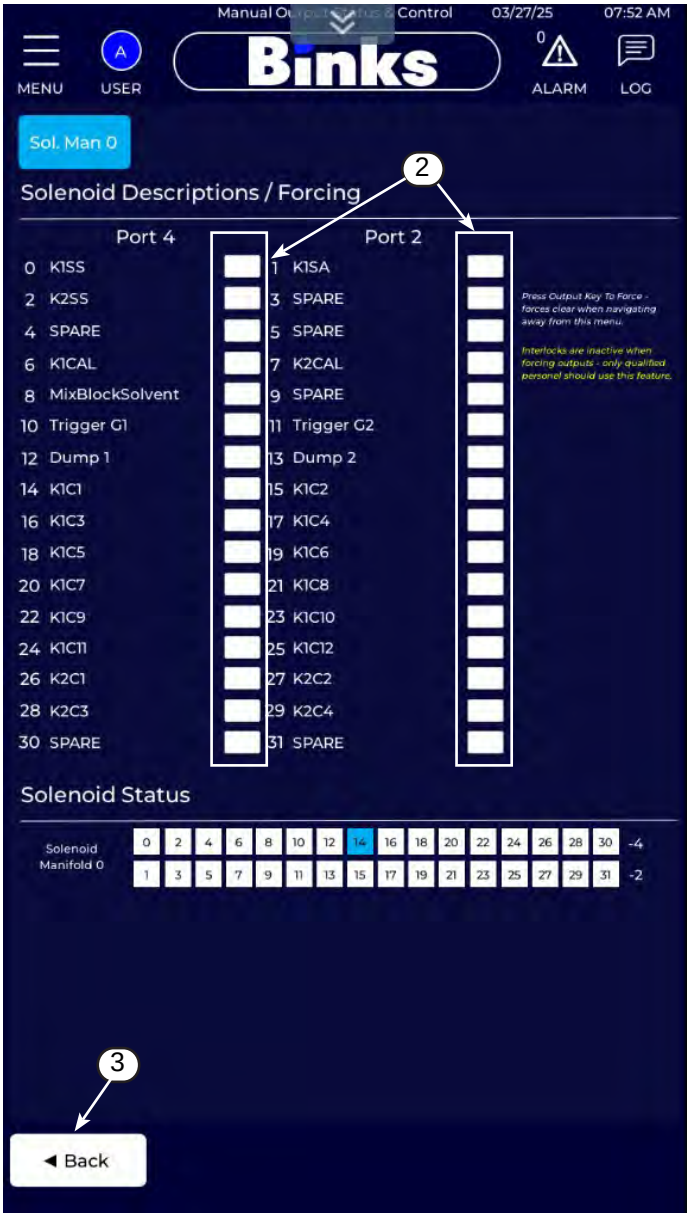
⚠ WARNING

Output interlocks are not observed in this mode.

13. Select **Back** (3) to return to the local fluid control screen.
14. When the manual override is inactive, it is possible to run fluid sequences directly from the local fluid control screen.
15. Select a fluid sequence button near the bottom of the screen to activate the sequence.

    When active, functions and outputs will indicate their status and let a sequence be viewed in operation from this screen.

    The station must be in run mode before a sequence is started from this screen.



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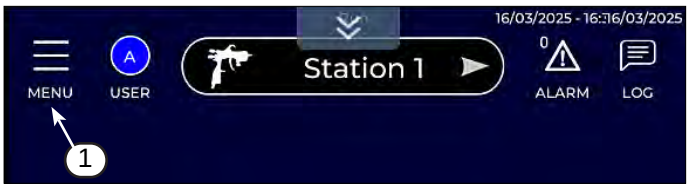
08 ADDITIONAL OPERATIONS

08.1 DATA LOG/REPORTING

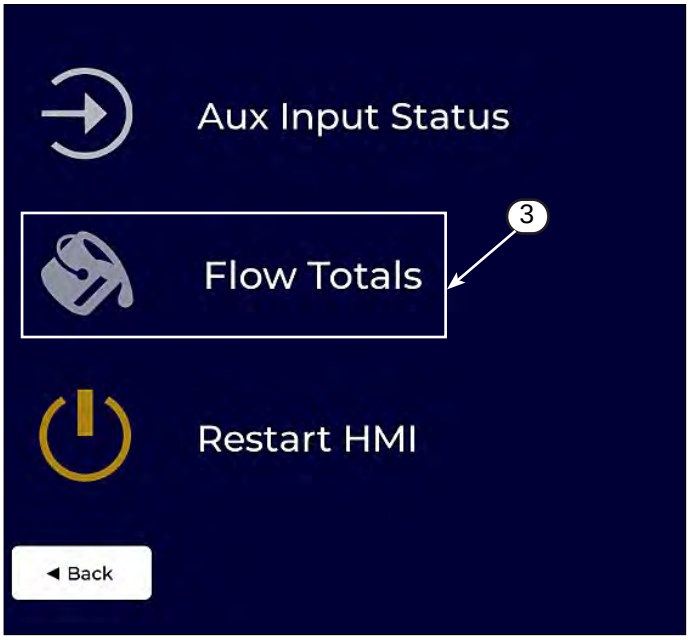
The RF2+ stores flow total data. To access the data:

1. Select **MENU** (1) on the main navigation bar.



2. Select **DIAGNOSTICS** (2) from the drop-down menu. This opens the diagnostics main screen.

3. Select **Flow Totals** (3) from the diagnostics main screen.



08.1.1 FLOW TOTALS

The RF2+ stores basic material flow data for the users to view.

Data is organized by:

- **Gun/Outlet Select** (1)
- **Time Range** (2)
- **Recipe** or **All Recipes** (3)
- **Flow Totals Units** (4): either liters or gallons

If more detailed data is needed for storage, connect the RF2+ to a SCADA or supervisory PLC and routinely poll the total and other identifiers to store the changes in a database.

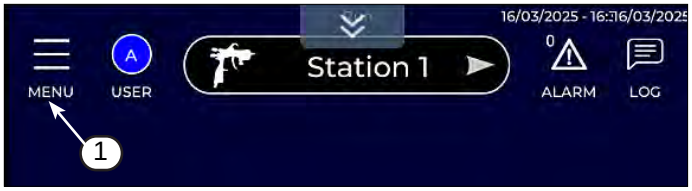
More information about the RF2+ to Fieldbus connection can be found in 05.1 Fieldbus I/O and 05.5 User to IntelliFlow RF2+ Input Arrays in the RF2+ Programming Manual 77-3165-5.

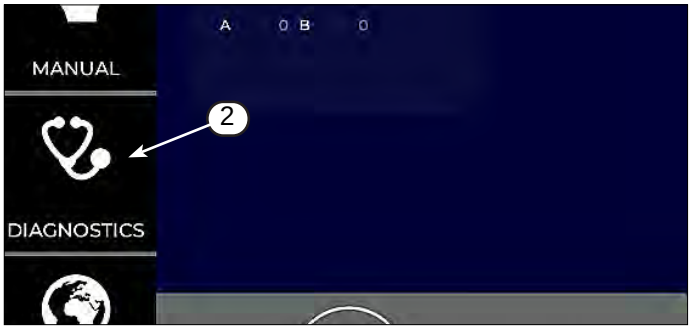
08.2 DIAGNOSTICS

The diagnostics screen contains miscellaneous functions for the RF2+ system.

To navigate to the diagnostics screen:

1. Select **MENU** (1) from the main navigation bar.
2. Select **DIAGNOSTICS** (2) from the main drop-down menu.

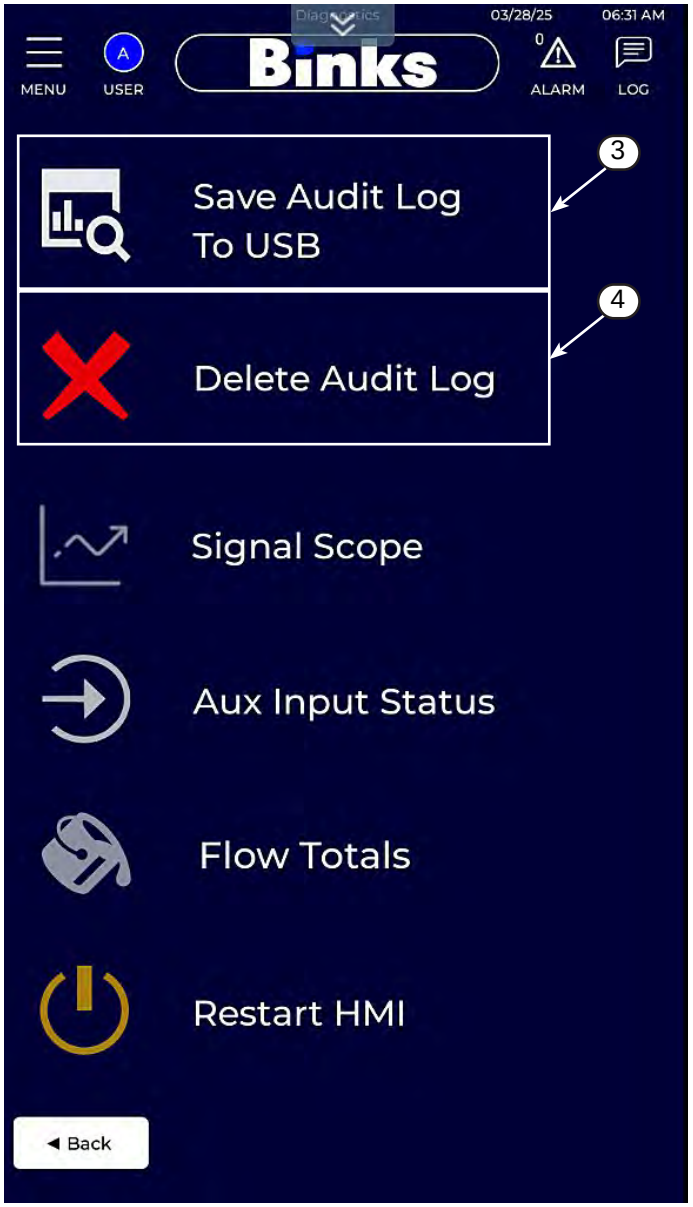




08.2.1 AUDIT LOG ACTIONS

The operator interface audits specific events, such as users logged in.

From the diagnostics screen, it is possible to export the audit log to a USB (in .CSV format) (3). Users may also delete the audit log if desired (4).



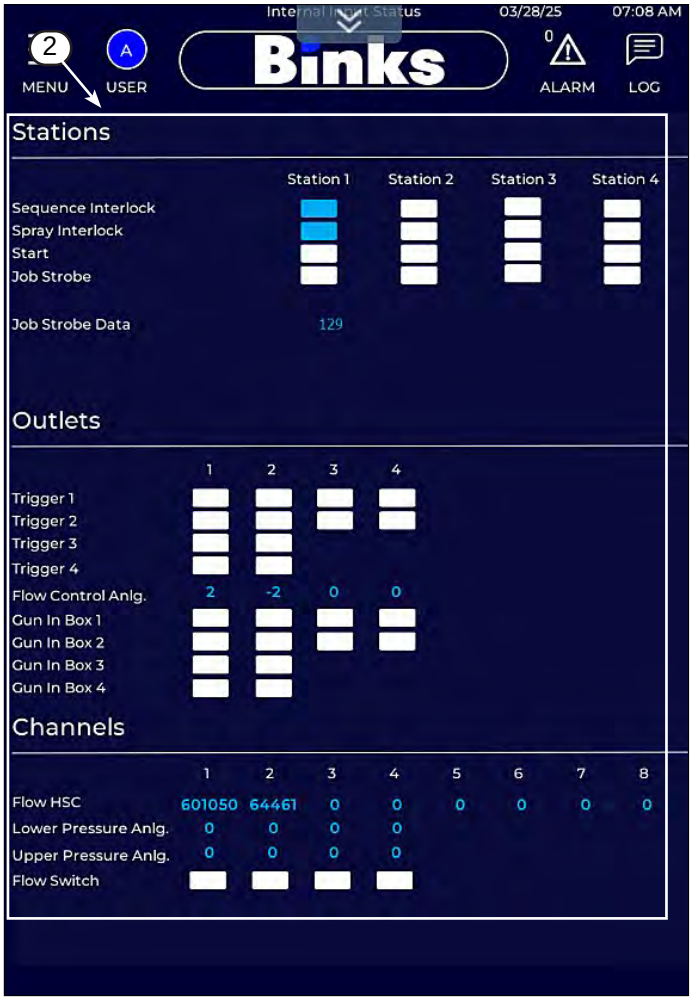
08.2.2 AUXILIARY INPUT STATUS

Use the auxiliary input status screen to check the functionality of inputs from auxiliary devices or some of the sensors that are connected to the RF2+.

To view the screen:

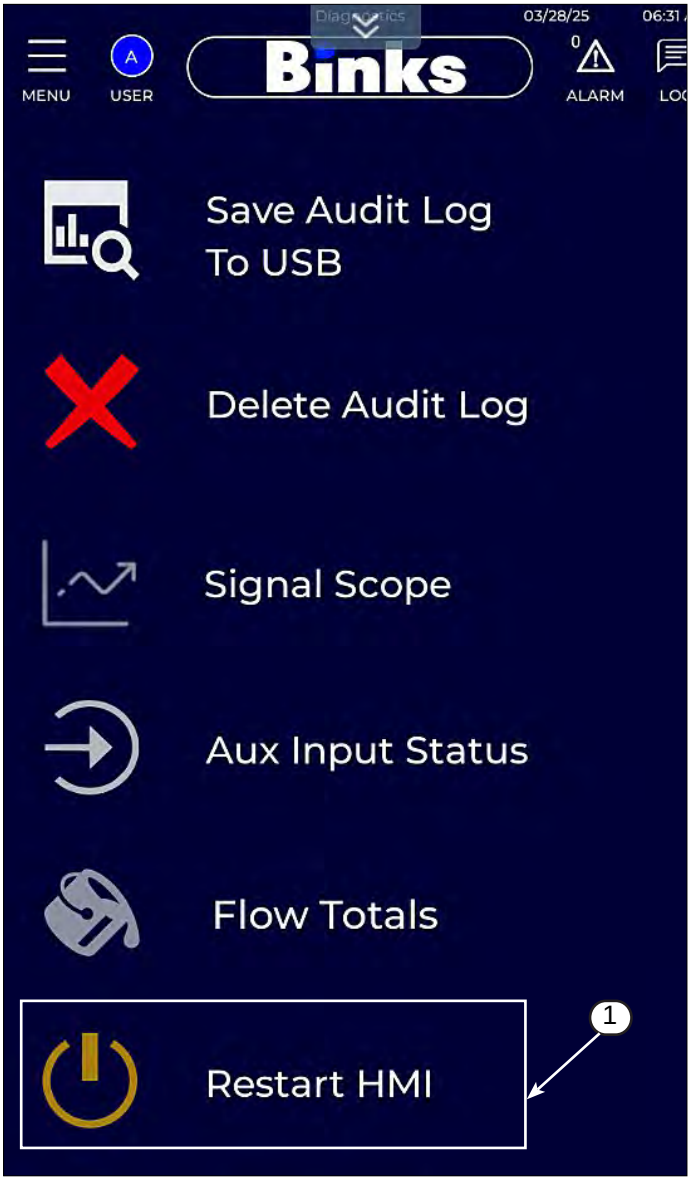
1. Select **Aux Input Status** (1) from the diagnostics screen.

2. View inputs (2).



08.2.3 RESTART HMI

Press **Restart HMI** (1) from the diagnostics screen to reboot the HMI.



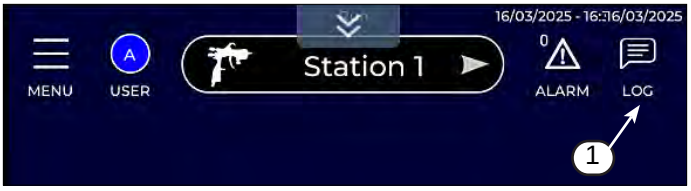
08.2.4 AUDIT LOG

The RF2+ captures events in the audit log function. Examples of events include:

- User login/out
- Recipe loaded
- Sequence called

To view the audit log:

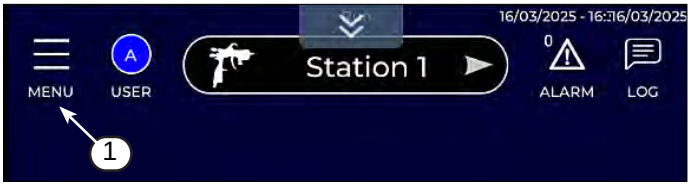
1. Select **LOG** (1) on the top-right of the main navigation bar.
2. The audit log screen can be filtered by duration (2) and then again by user, timestamp, operation, and information (3).

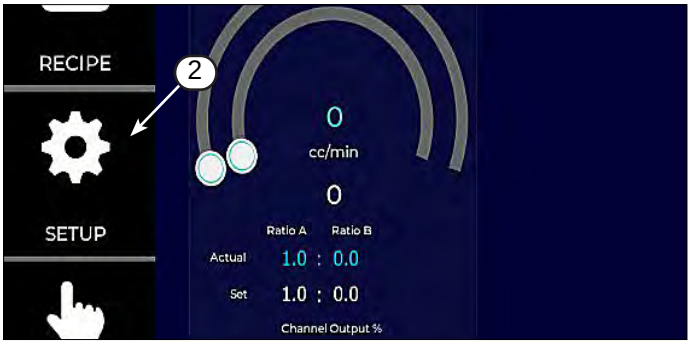


08.3 CORVINA

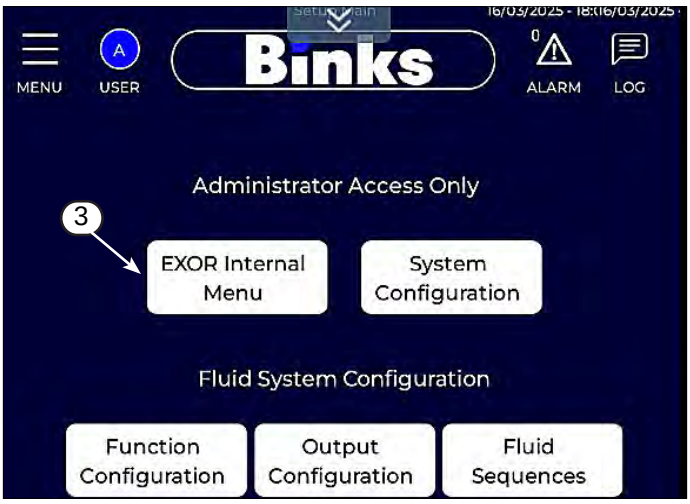
08.3.1 CONFIGURE A WI-FI CONNECTION

1. Login as an "admin." See 05.10 Log In for more detailed instructions on logging in as an administrator.
2. Select **MENU** (1) from the main navigation bar.
3. Select **SETUP** (2) from the main drop-down menu.



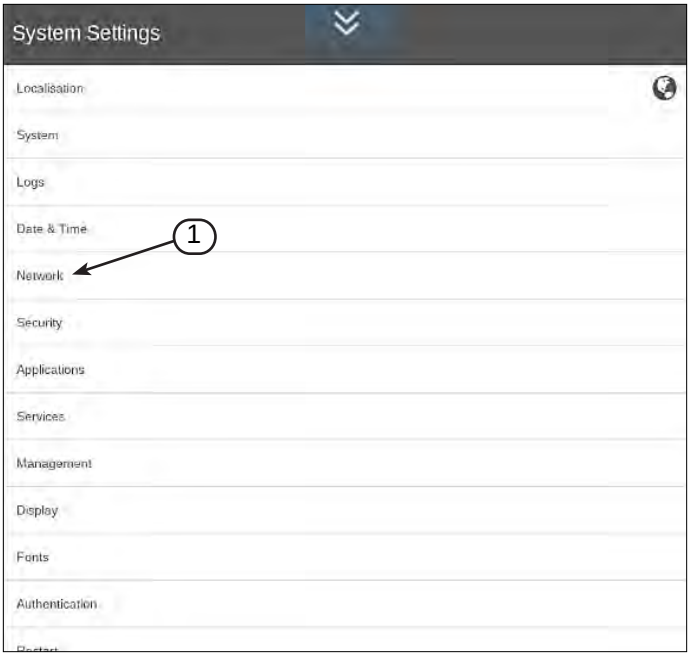


4. Select **EXOR Internal Menu** (3) from the setup menu.

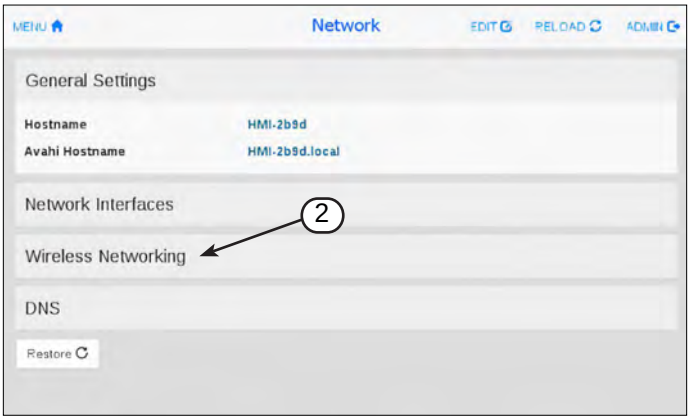


5. Select **Show system settings** (4) from the menu.
6. Sign in with the following credentials:
   a. Username: admin
   b. Password: Paint123$

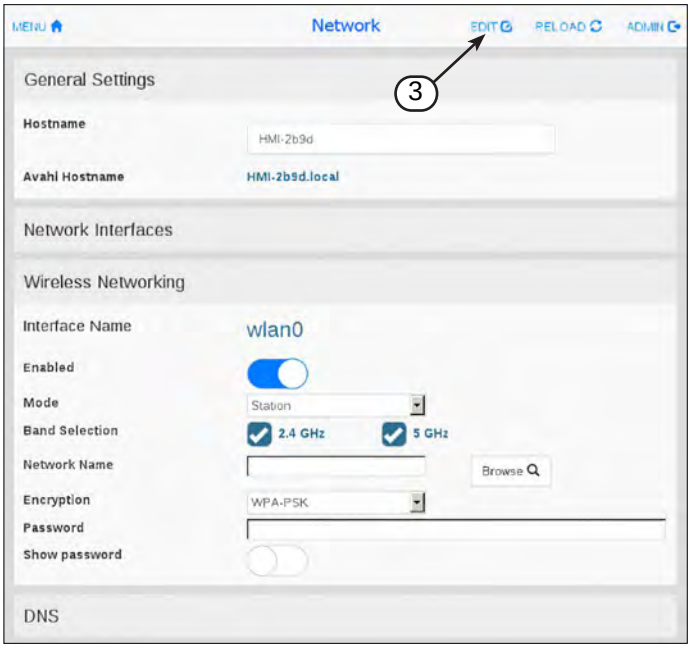
7. Select **Network** (1).



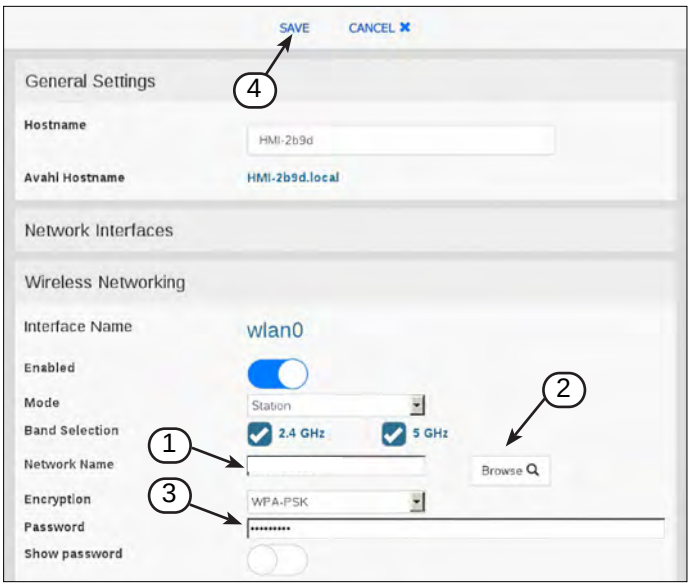
8. Select **Wireless Networking** (2).



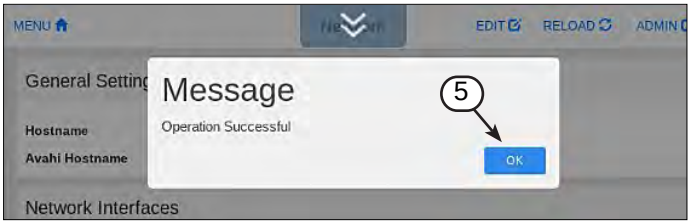
9. Select **Edit** (3) at the top of the screen.



10. Enter **Network Name** (1) or select **Browse** (2) to access a network browser.
11. Enter the wifi password (3).
12. Select **SAVE** (4).



13. A message pop-up window will appear with **Operation Successful**. Select **OK** (5) to continue.



14. Select **MENU** (6) at the top left of the screen.

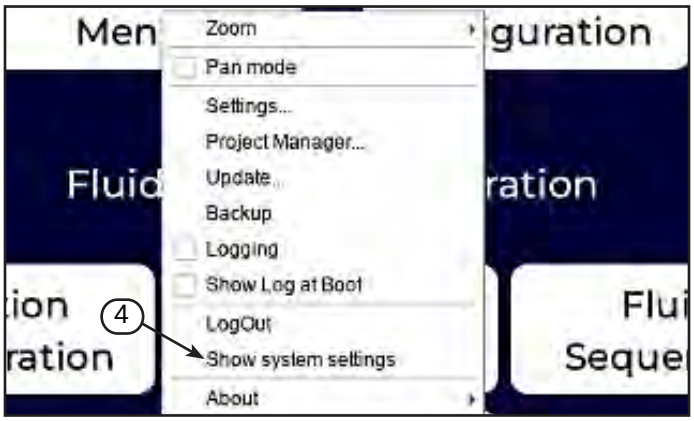
15. Select **EXIT** (7) to return to the setup main screen.
16. Continue the Corvina setup in 08.3.3. Configure Corvina.

08.3.2 CONFIGURE AN ETHERNET CONNECTION

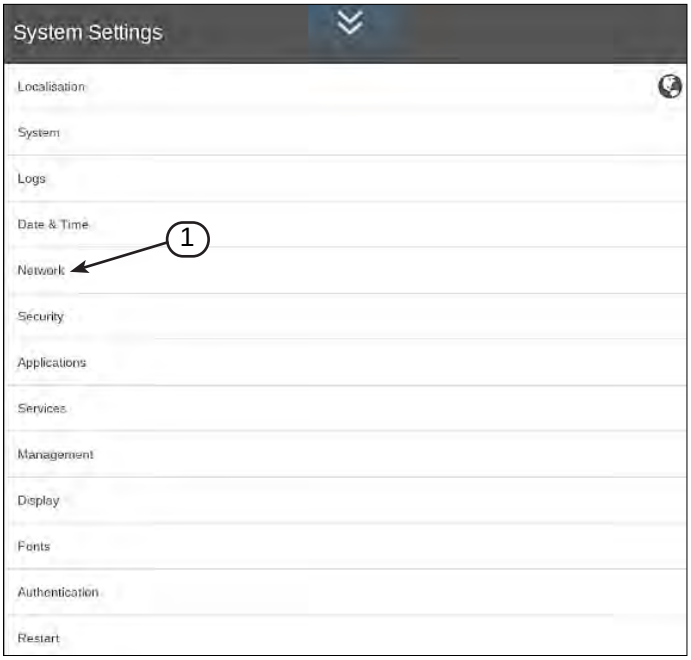
1. Login as an "admin." See 05.10 Log In for more detailed instructions on logging in as an administrator.
2. Select **MENU** (1) from the main navigation bar.
3. Select **SETUP** (2) from the main drop-down menu.

4. Select **EXOR Internal Menu** (3) from the setup menu.

5. Select **Show system settings** (4) from the menu.

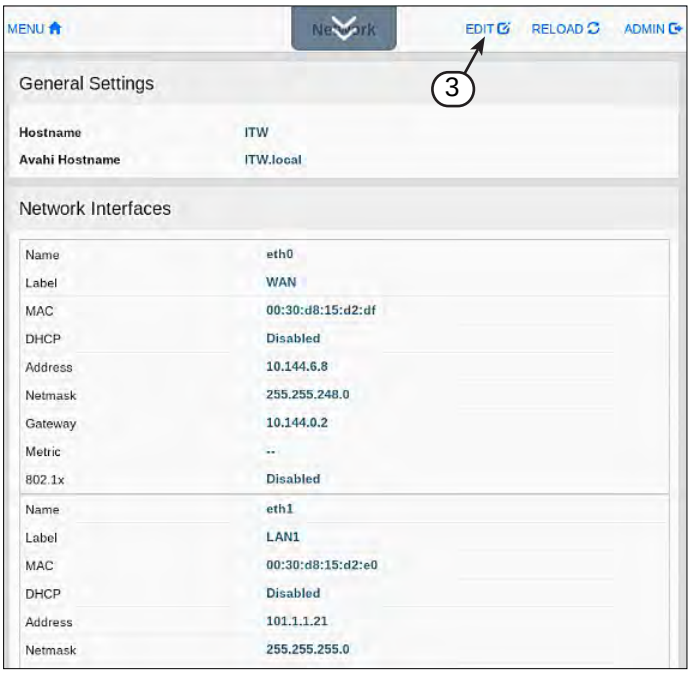


6. Select **Network** (1).

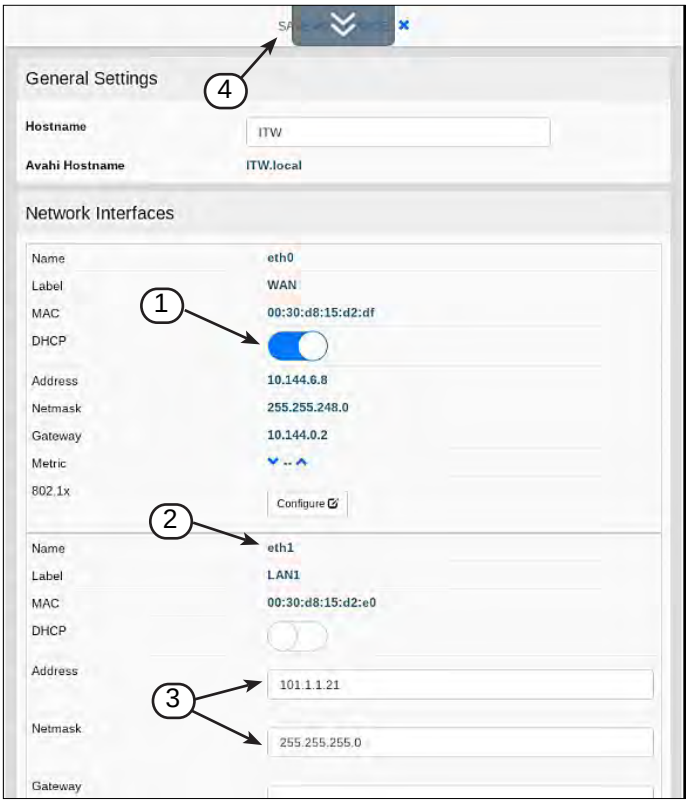


7. Select **Network Interfaces** (2).

8. Select **EDIT** (3).



9. Find the ethernet adapter connected to your ethernet network.
   - **DHCP** (1) is used by default.
   - If an appropriate DHCP address has been assigned, no further changes are necessary. Otherwise, turn off **DHCP** and manually enter the network address information in the appropriate fields.
   - If a static IP address is used, disable **DHCP**, then enter the desired network settings.



⚠ WARNING

Do not change the network settings for **eth1** (2). This will interrupt communication between the HMI and the PLC. If these settings are lost, the default settings (3) are: Address **101.1.1.21**, Netmask **255.255.255.0**.

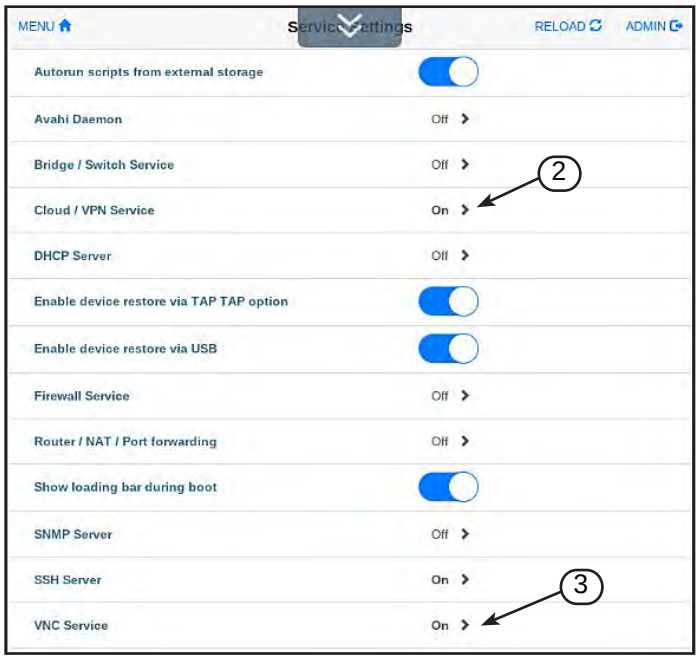
10. Select **SAVE** (4) to continue.

11. Select **MENU** (5) at the top left.
12. Continue the Corvina setup in 08.3.3. Configure Corvina.

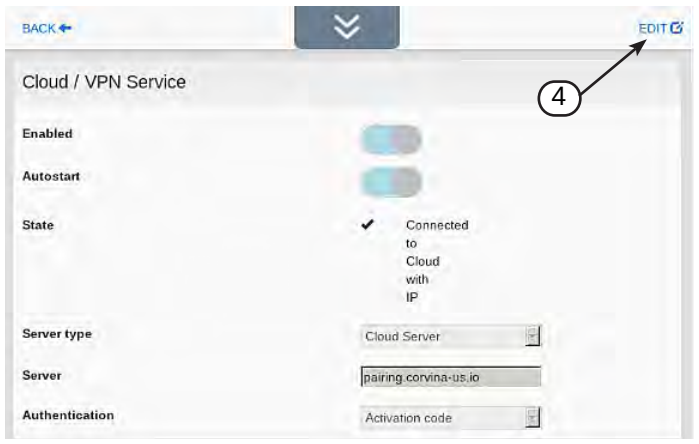
08.3.3 CONFIGURE CORVINA

1. Select **Services** (1) from the Corvina system settings screen.

2. Verify the following services are enabled:
   - **Cloud / VPN Service** (2)
   - **VNC Service** (3)



3. Verify **Cloud / VPN Service** settings.
   a. Select **Cloud / VPN Service** (2).
   b. Select **EDIT** (4).

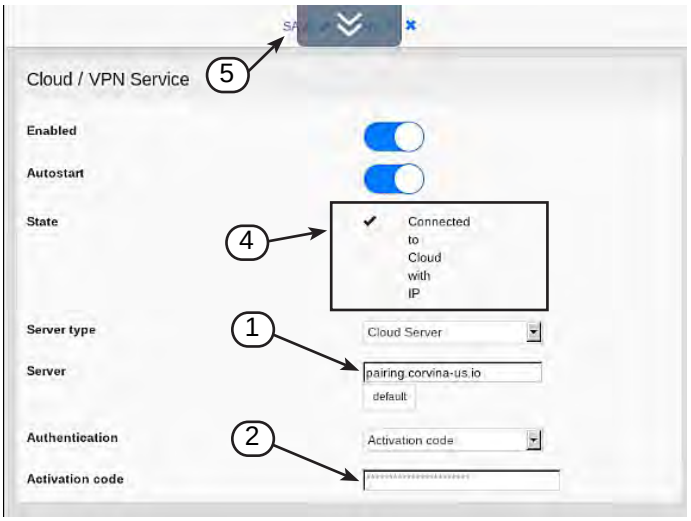


c. Verify the **Server** displays **pairing.corvina-us.io** (1).

d. Enter your activation code (2). Activation codes are supplied by Binks.

e. **State** (4) will update to show **Connected to Cloud with IP** when correctly configured.

f. Select **SAVE** (5).



NOTICE

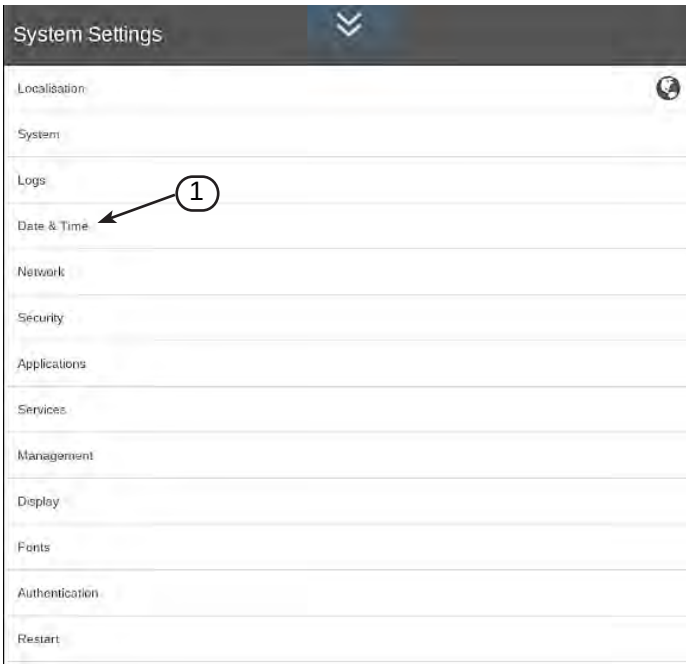
Corvina uses the OpenVPN protocol. If communication issues are encountered, verify with your IT administrator that ports 1194 UDP and 443 TCP are open on the network connected to the RF2+.

08.3.4 NTP SETUP

The Network Time Protocol (NTP) is used to synchronize computer clocks over data networks with variable latency. When Corvina is used, Binks recommends using NTP to ensure the system time is always up-to-date. Incorrect system time can lead to authentication issues.

To correctly set the synchronization:

1. In the system settings screen, select **Date & Time** (1).



2. Select **EDIT** (2) to open the date and time screen.

3. Select the current time zone (3) where the machine is installed.
4. If desired, select **Automatic Update (NTP)** (4) to automatically synchronize the system with the remote server.
5. Press **SAVE** (5) to save the date and time settings and exit the screen.

08.3.5 DISABLE CLOUD ACCESS

The cloud access feature of the RF2+ allows for diagnosing, troubleshooting, and updating the system. However, some users may not want to use this type of service.

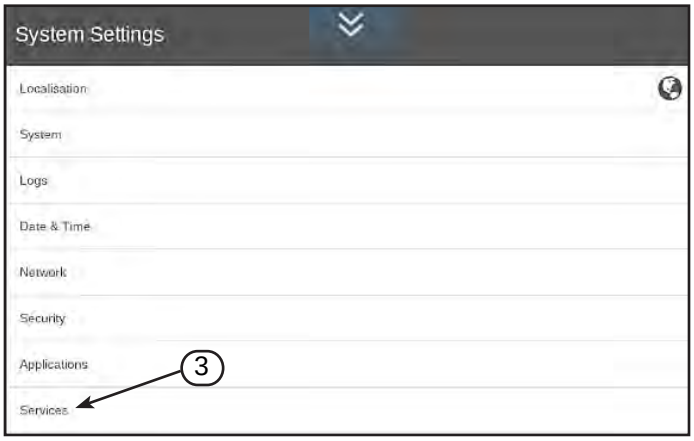
Access to the RF2+ via Exor's Corvina Cloud service can be disabled in two ways:

1. Disconnect the RF2+'s physical "Cloud" RJ-25 port from a network connection.
2. Through the Exor internal screen:
   a. Login as an "admin." See 05.10 Log In for more detailed instructions on logging in as an administrator.
   b. Select **EXOR Internal Menu** (1) from the setup screen.
   c. Select **Show system settings** (2).
   d. In the settings screen that opens, press **Services** (3) and then **Cloud Service** to open the cloud service screen.
   e. Select **EDIT** at the top right of the cloud service screen.
   f. Select the slider next to **Enabled** (4) to disable the cloud service.
   g. Press **SAVE** (5).
   h. To return to the main run screen, select **BACK**, **MENU**, and then **EXIT**.

⚠ WARNING

Corvina is secured. However, anytime a machine is connected to the internet, it is possible malicious actors may gain access to the RF2+ via the cloud service. In such a scenario, they could activate the unit remotely and release chemicals when no personnel are present. Deactivating the RF2+'s air and fluid supplies when no personnel are around minimizes the risk, as recommended in the safety section.

If you suspect someone has unauthorized access to your RF2+, immediately contact either your organization's administrator of your Corvina Cloud service or the distributor of your equipment. Reach out to Binks for assistance if you are unaware of this information.



08.4 BACKUP/RESTORE

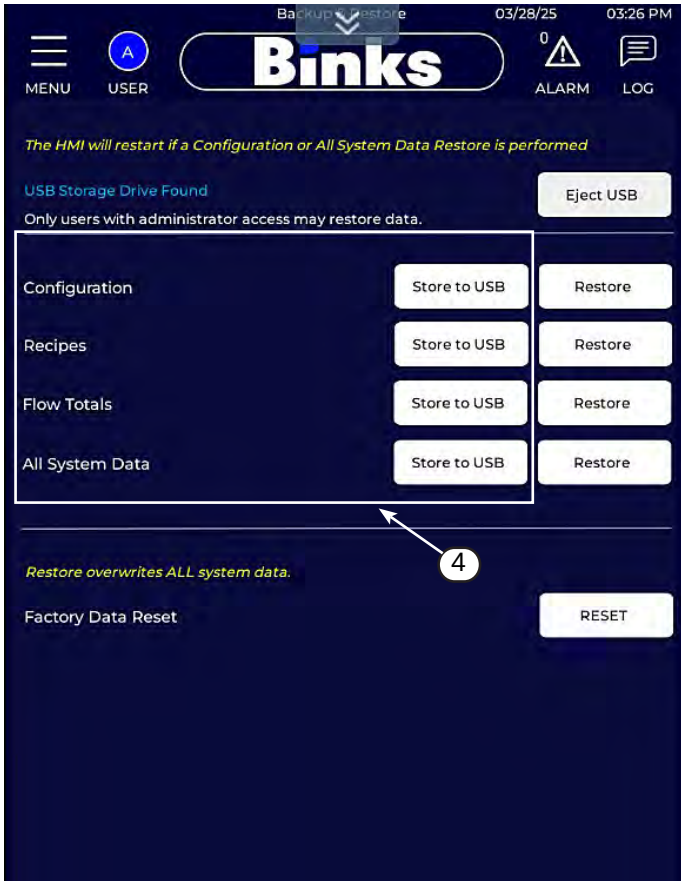
All stored settings, including recipe data, global setup data, fluid system configuration, and sequences, can be backed up to a USB stick or restored from USB or other media.

This functionality lets the entire system configuration (or individual parts of it) be passed from one RF2+ to another or restored in the event of a system failure that results in the loss of data.

To access the backup and restore screen:

1. Select **MENU** (1) from the main navigation bar.
2. Select **SETUP** (2) from the main drop-down menu.
3. Select **BACKUP/RESTORE** (3) from the lower right of the screen.

4. The system will display the backup and restore screen with the configurations (4) available to save and store to USB.



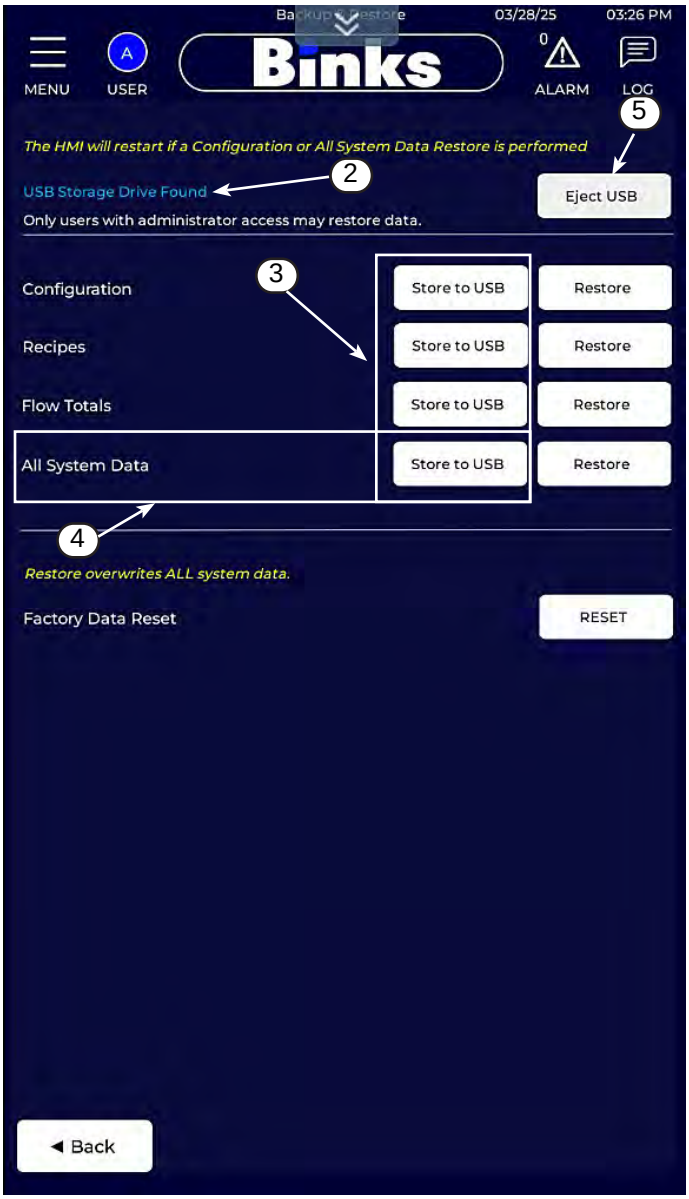
08.4.1 STORE DATA

The system automatically backs up data. To store data to a USB flash drive:

1. Connect a USB flash drive to the USB port (1) provided on the left side of the control enclosure.

2. The HMI backup and restore screen will indicate that a device is found (2).
3. When a USB stick is detected, each row will display the **Store to USB** (3) option. Press **Store to USB** to save that setting to the USB flash drive.

   The **All System Data** row (4) will store all system information.
4. Select **Eject USB** (5) to eject the USB drive. Follow the prompts.



08.4.2 RESTORE DATA

To restore from a USB flash drive:

1. Connect a USB flash drive to the USB port provided on the left side of the control enclosure (1).

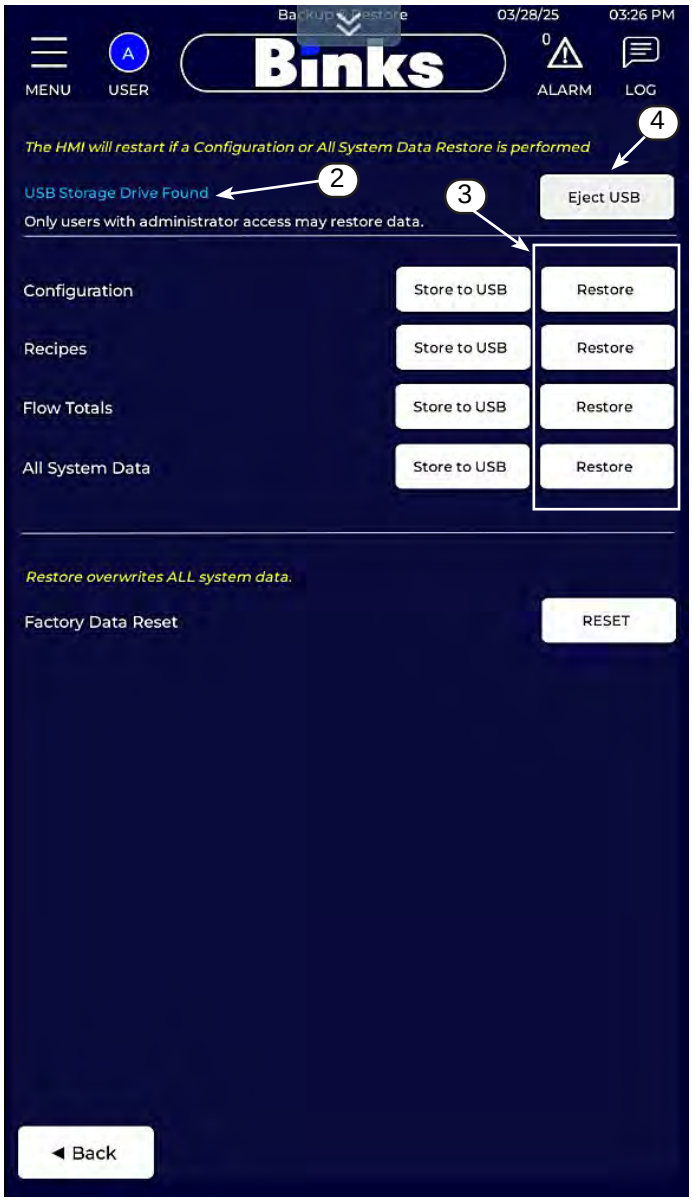
2. The HMI backup and restore screen will indicate that a device is found (2).
3. Press **Restore** (3) on any row. The system will automatically find the files in the USB if the files have the same file layout as when they were first created.

NOTICE

Files must be kept in the original layout on the USB for the restore function to work.

If a configuration restore or an all system data restore is completed, the system will reboot. "PLC critical fault" will be displayed. This is normal.

4. Select **Eject USB** (4) to eject the USB drive. Follow the prompts.



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MANUAL CHANGE SUMMARY		
Date	Description	Version
11/04/2025	Initial Release.	R1.0

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WARRANTY POLICY

This product is covered by Binks' materials and workmanship limited warranty.

The use of parts or accessories from sources other than Binks will void all warranties. Failure to follow reasonable maintenance guidance provided can invalidate the warranty.

For specific warranty information, please contact Binks.

For technical assistance or to locate an authorized distributor, contact one of our international sales and customer support locations listed below.

REGION	BINKS CONTACT
Americas	Tel: 1-800-992-4657
Europe, Africa, Middle East	Tel: +4401202571111
India	marketingroa@binks.com
China	Tel: +862133730108
Korea	Tel: +82313663303
Japan	Tel: +81457856421
Australia	Tel: +61085257555

WARRANTY PAGE

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