Installation & Operating Manual
ProMinent® ProMtrac
Cooling Tower
Water Treatment Controller

ProMtrac_OM.docx (5/23/13): – pn.

Please completely read through these operating instructions first! Do not discard! The warranty shall be invalidated by damage caused by operating errors!

ProMinent Fluid Controls, Inc. (USA) 136 Industry Drive, Pittsburgh, PA 15275

CONTENTS

Safety Electrical Shock Hazard

Removing the lower faceplate panel with the controller plugged in, exposes the user to AC power line voltages.

USER WARNING : CAUTION

Water Treatment Controllers operate water valves and may pump hazardous, corrosive and toxic chemicals.

Removing the internal faceplates exposes the user to the risk of electrical shock at power line voltages.

Understand fully the implications of the control methods, setpoints and alarms that you select. Harm to personnel and damage to equipment may result from mis-application.

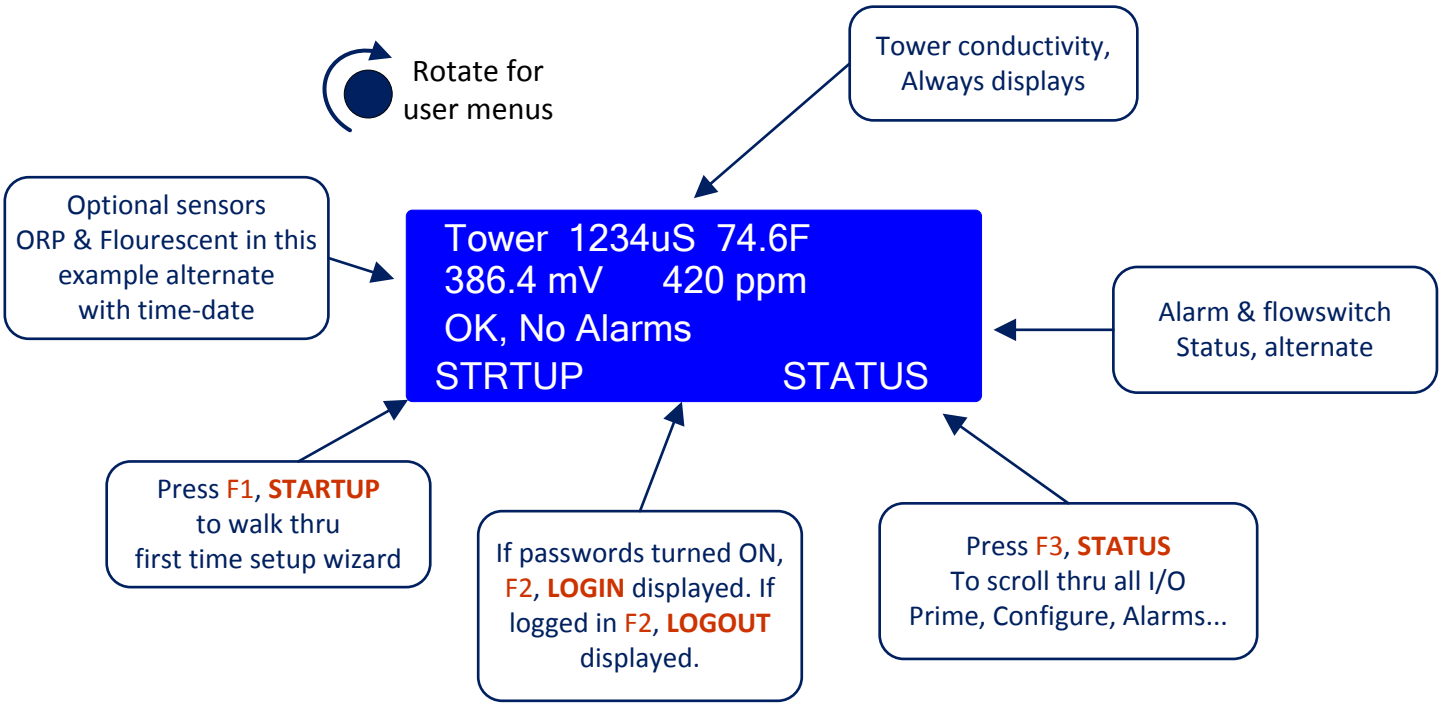
Unplug or turn OFF the AC power to the controller if you have any concerns regarding safety or incorrect controller operation and notify supervisory staff.

YOUR CONTROLLER

ProMtrac controllers are supplied in different configurations, part numbers and sensor sets. This manual includes information on optional components that may not be included with your controller

The **WIRING** section includes the information for terminating the sensor, water meters, AC power, pumps & solenoids

1.1 Power Up Display



The sensors on the 2nd line of the power up display vary with the installed sensor set.
pH or ORP have precedence followed by inhibitor ppm sensors and then make-up conductivity.

The value of each sensor, water meter, solenoid and pump can be viewed by pressing **STATUS** or by using the menu which displays on rotation.

OK, No Alarms alternates with the flow switch ON time.

Output Relays 1 to 5

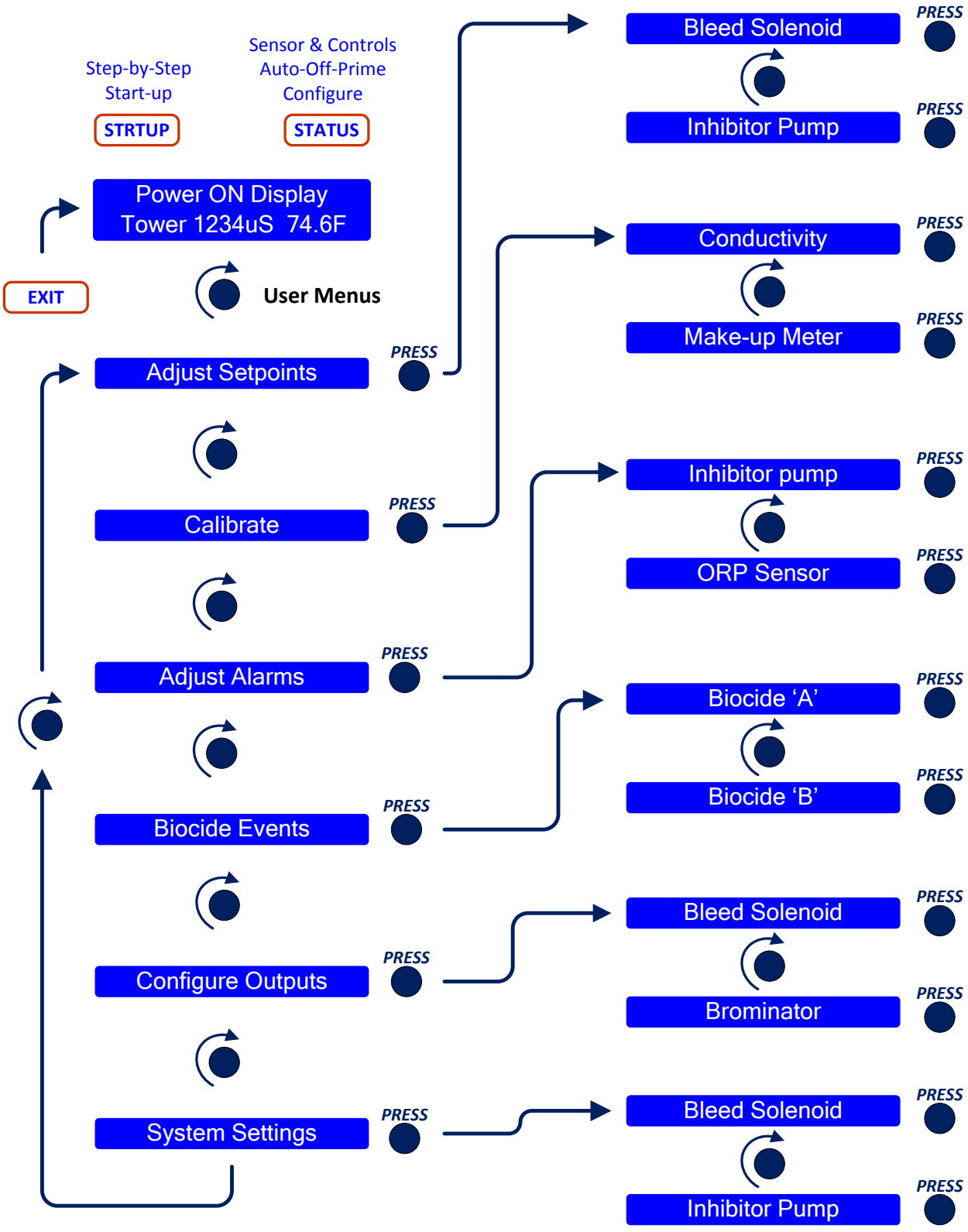
- RED = alarmed
- FlashRED = OFF stopped by user
- GREEN = ON
- FlashGREEN = Priming or Test

System

- BLUE = OK, flow, no alarms
- FlashBLUE = OFF, no flow
- RED = alarmed
- FlashRED = Load fuse fails
- GREEN = OFF, USB drive inserted
- FlashGREEN = Upload complete, remove drive

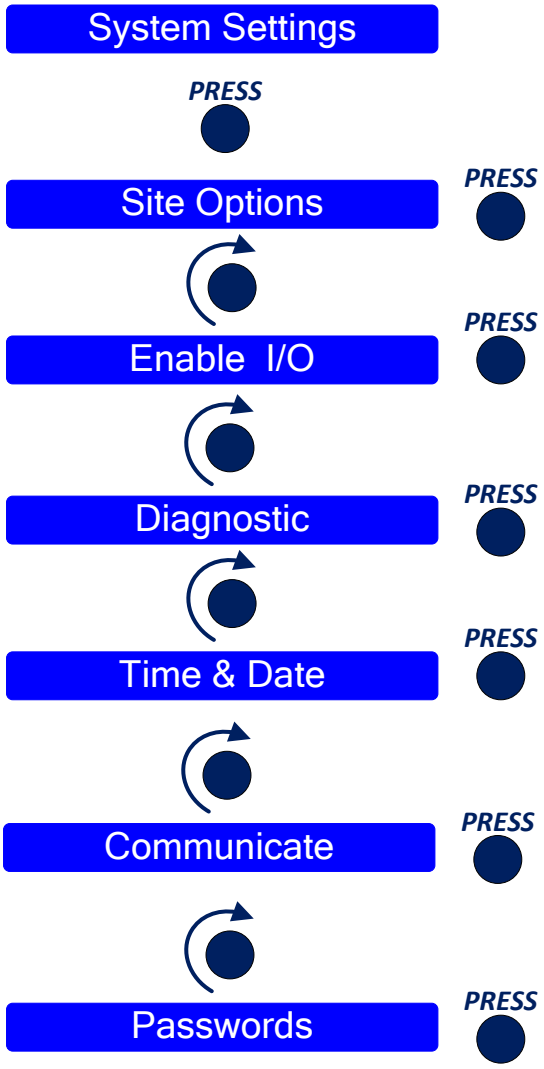
1.2 User Menus

Use the rotary dial to view user menus



1.2 User Menus

Press @ **System Settings** navigates to:



Select U.S.-metric units, Keypad passwords ON/ OFF, USB log file period, Keypress response, Alarm Relay re-purpose, Flowswitch type, LCD flash rate...

Turn ON inputs disabled by Keypad & Browser users.

12VDC Tubine Meter power voltage.
ProMtrac Serial Number
Current 'Plug&Feed' configuration file name
Last system reset, Admin password defaulted Y/N,
Watchdog reset count, Firmware Version,
LCD contrast adjust

Set time & date and day of week.

View & modify Ethernet IP address & Netmask

Logged in, current user password edit.
Enter 'Reset Passwords' code.
This option does not display unless logged in & Passwords turned ON in **Site Options**

Press @ other menu options navigates to the selected I/O.
Selecting **STATUS** at the Power ON display scrolls thru all I/O

1.3 Status Displays

STATUS Page 1 of 3

Goes to **Alarms** if alarms
Otherwise goes to **Conductivity**

PRESS

Press @ any time to return to the power-up, summary display

Clears high & low sensor alarms.
Resets feed limits
Only displays if alarms active

RESET

Scroll through time stamped user activity log

KEYLOG

Scroll thru all I/O. Pumps & Solenoids follow the controlling sensor

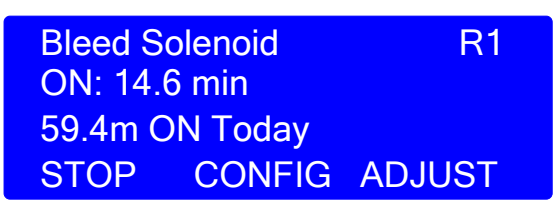
View and adjust
High & low alarms, delay on alarm,
set alarm relay,disable alarms

ALARMS

Calibrate tower conductivity

CALIB

min-max from midnight or most recent power OFF-ON.
Measure of float effect on cycles.



Turn ON bleed

TEST

Displays if Bleed OFF

Turns OFF bleed

STOP

CONFIG

View & select bleed control method

ADJUST Adjust setpoint

Time in current bleed cycle & total bleed time from midnight or power ON

View and adjust
High & low alarms, delay on alarm,
set alarm relay,disable alarms

ALARMS

View & select meter type & volume/contact or 'K' factor

CONFIG

Year-to-date total alternates with total volume/days

Turns OFF pump & it stays OFF

STOP

Displays if Pump ON

Turn ON Pump

PRIME

CONFIG

View & select feed control method

ADJUST Adjust setpoint

If pump ON, dislays time owed.
Display varies with feed control method

1.3 Status Displays

STATUS Page 2 of 3

PRESS — Press @ any time to return to the power-up, summary display

ProMtrac's with pH option display similar **pH Sensor** information

View and adjust High & low alarms, delay on alarm, set alarm relay,disable alarms

ALARMS

```
ORP Sensor              C
348.1 mV
340.4 to  350.4 mV
ALARMS          CALIB
```

CALIB — Calibrate ORP sensor

ORP range from midnight or most recent power OFF-ON.

View & Adjust PreBleed & Lockout, Alarms & Feed Cycle days

Turn ON Pump or Brominator

PRIME

CONFIG

```
Oxidant Pump            R3
ON:   18.4 min
126.4min ON today
STOP  CONFIG    ADJUST
```

Displays if Pump OFF

View, Add & Delete feed events
View-Adjust ORP during events

STOP

ADJUST — Adjust setpoint

Turn OFF Pump or Brominator

'**ON today**' alternates with '**2 Events Day 4of7**'

View & select control sensor and its 4mA & 20mA setpoints

4-20mA outputs are Optional & may not be installed in your ProMtrac

CONFIG

```
4-20mA Out #2           E
 11.2mA  44.8%
      514uS  AUTO
MANUAL  CONFIG  VERIFY
```

Set to 20mA(span) or 4mA(zero) & adjust span or zero

Turns OFF AUTO — MANUAL

VERIFY

Displays loop current and % of full span and controlling sensor value with mode

ProMtrac's without ORP or pH will have a **Biocide 'A'** & **'B'**

CONFIG

```
Biocide 'B'             R4
No Event
4 Events,Day 11of28
PRIME  CONFIG  EVENTS
```

View & Adjust PreBleed & Lockout, Alarms & Feed Cycle days

Turns ON Pump or Brominator

PRIME

EVENTS

Add, Delete & View feed Events

If Event running, displays time remaining. #of Events alternates with time ON today

```
Alarm Relay             R5
No Alarms
0.0 min ON today
TEST
```

Alarm Relay R5 may be reconifigured in **System Settings** as another Biocide, Inhibitor or Conductivity control

Turns ON the Alarm Relay

TEST

TEST not available if alarmed

The scroll order of sensors and pumps varies with optional cards, control types & disabled-enabled I/O

1.3 Status Displays

STATUS Page 3 of 3

PRESS

Press @ any time to return to the power-up, summary display

View and adjust
High & low alarms, delay on alarm,
set alarm relay,disable alarms

ALARMS

Temperature F
84.5 F
59.4 to 84.5F
ALARMS CALIB

Temperature is measured by the tower conductivity sensor.

CALIB Calibrate Temperature

ORP range from midnight or most recent power OFF-ON.

View and adjust
ON & OFF time
alarm relay,disable alarms

ALARMS

Flowswitch K
ON: 18.4 min
126.4min ON today
ALARMS

Thermal flowswitch @ '**K**'
Mechanical flowswitch @ '**J**'

OFF time alarm could be used to flag a 24/7 tower outage . ON time alarm to flag a tower ON too long.

View and adjust
ON & OFF time
alarm relay,disable alarms

ALARMS

Low Tank Level J
OFF:
0.0 min ON today
ALARMS

If using the thermal flowswitch, '**J**' may be used as a contact set input.

OFF: when contact set OPEN
Browser connect to invert sense.

View and adjust
High & low alarms, delay on alarm,
set alarm relay,disable alarms

ALARMS

Manual Value G
126 ppm
106 to 126 ppm
ALARMS CALIB

Manual values are logged & can Be used for control & 4-20mA outputs.

CALIB

Used to enter the result of a manual chemical test.

Inputs '**G**', '**H**' & '**J**' can be disabled if not used @ this site

View and adjust
High & low alarms, delay on alarm,
set alarm relay,disable alarms

ALARMS

Flourescence D
26.7 ppm
19.4 to 28.0 ppm
ALARMS CALIB

An isolated 4-20mA input is optional & may not be installed in your ProMtrac

CALIB

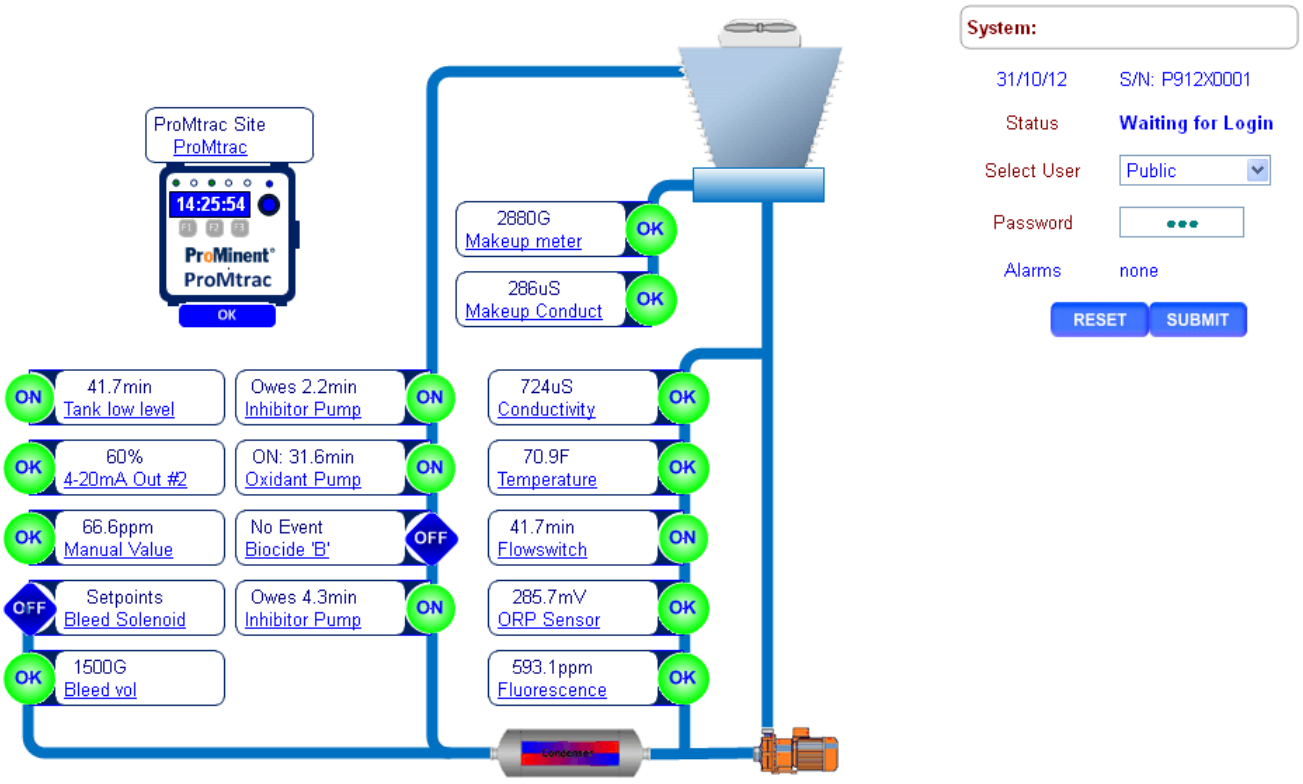
Used to calibrate the 4-20mA input that represents ppm

Optional DC isolated 4-20mA input card

1.4 Browser View

ProMtracs include a built-in command & control web server with a real time view of your controller operation.

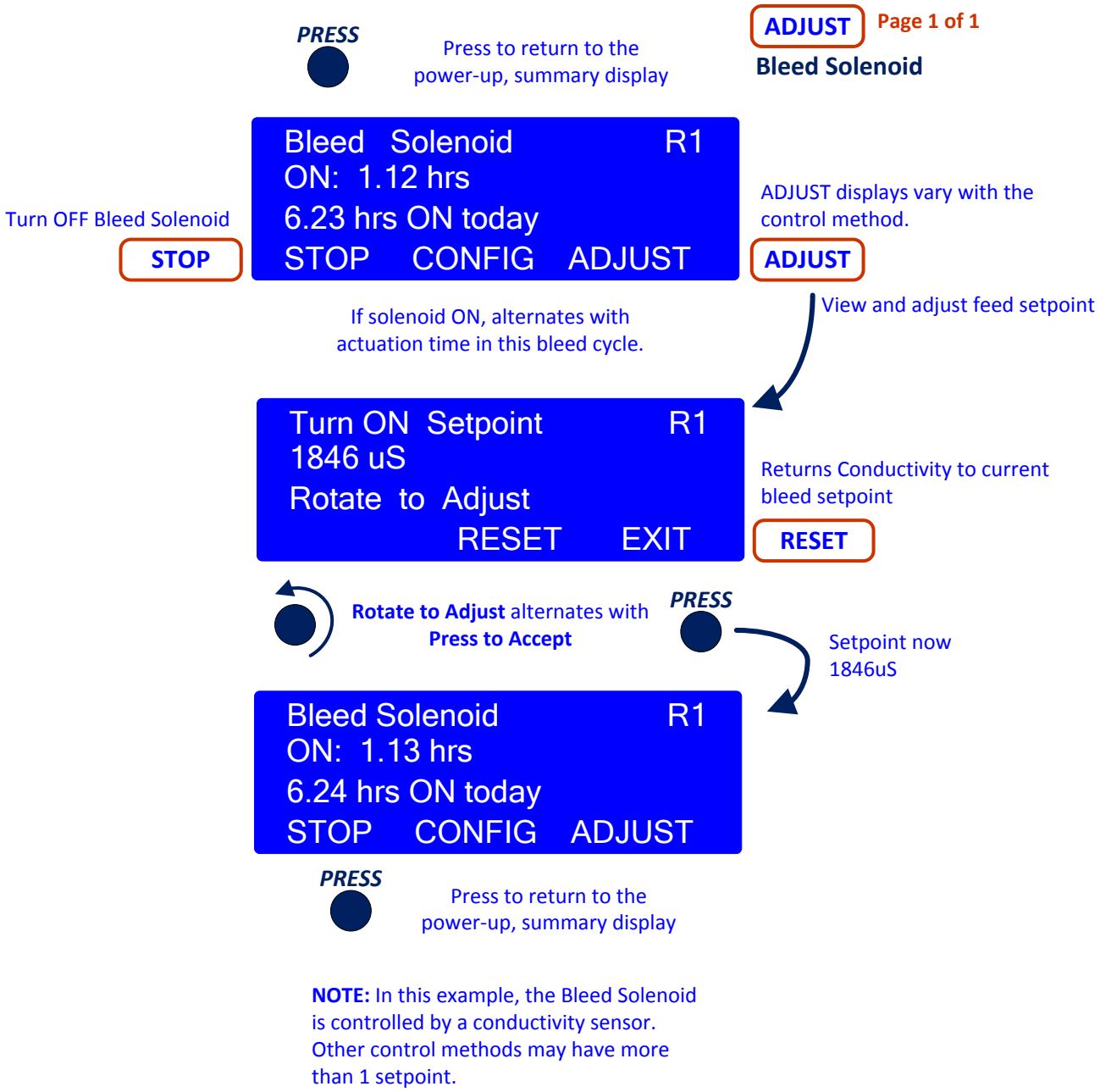
You can browse with Mozilla's Firefox or Internet Explorer over an Ethernet connection. Modifying the controller requires a login.



Disabled inputs are automatically removed from the browser view.
User may switch icons to reflect their site's usage.

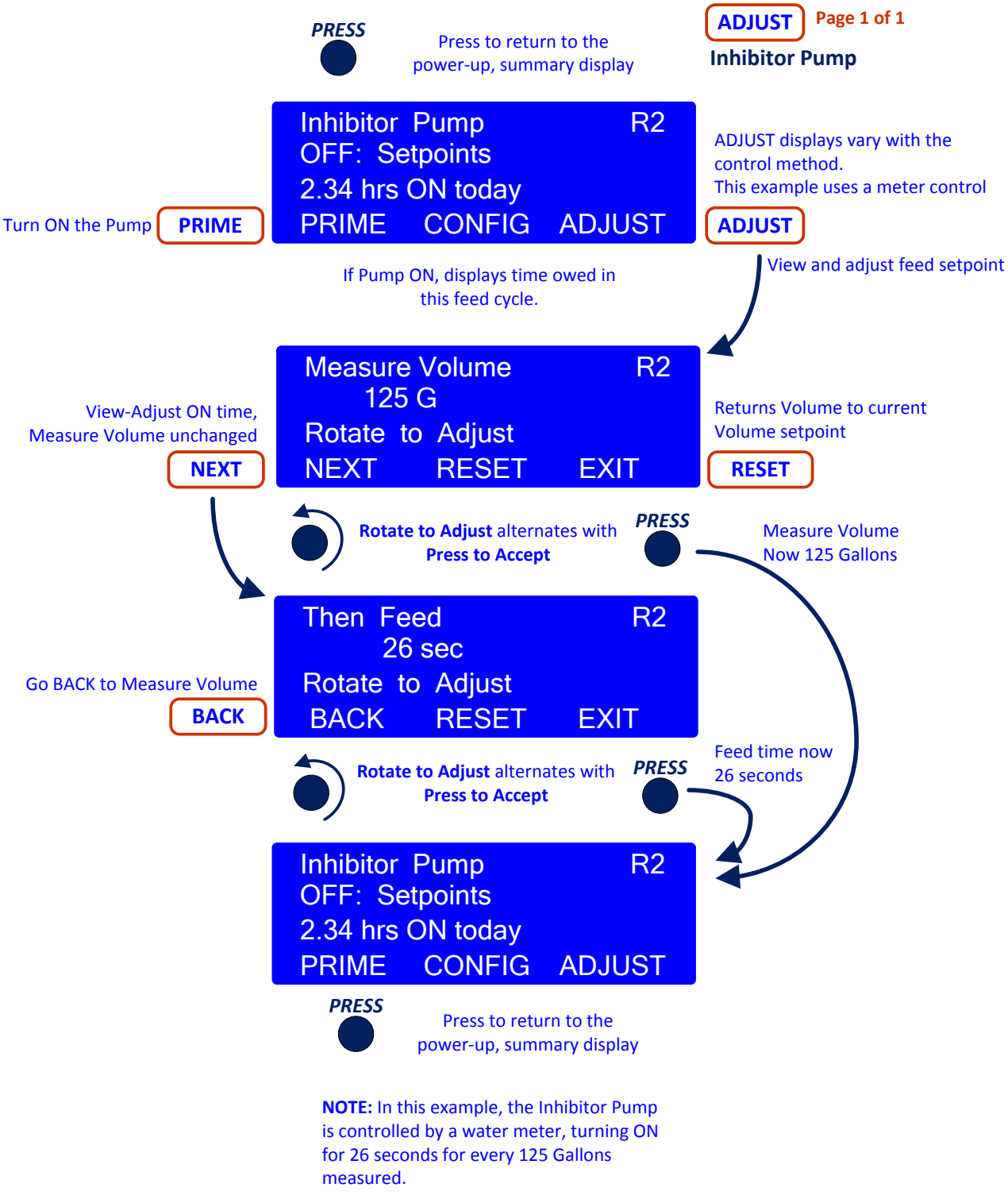
See the ProMtrac Browser Manual for detailed information.

2. Adjust Setpoints



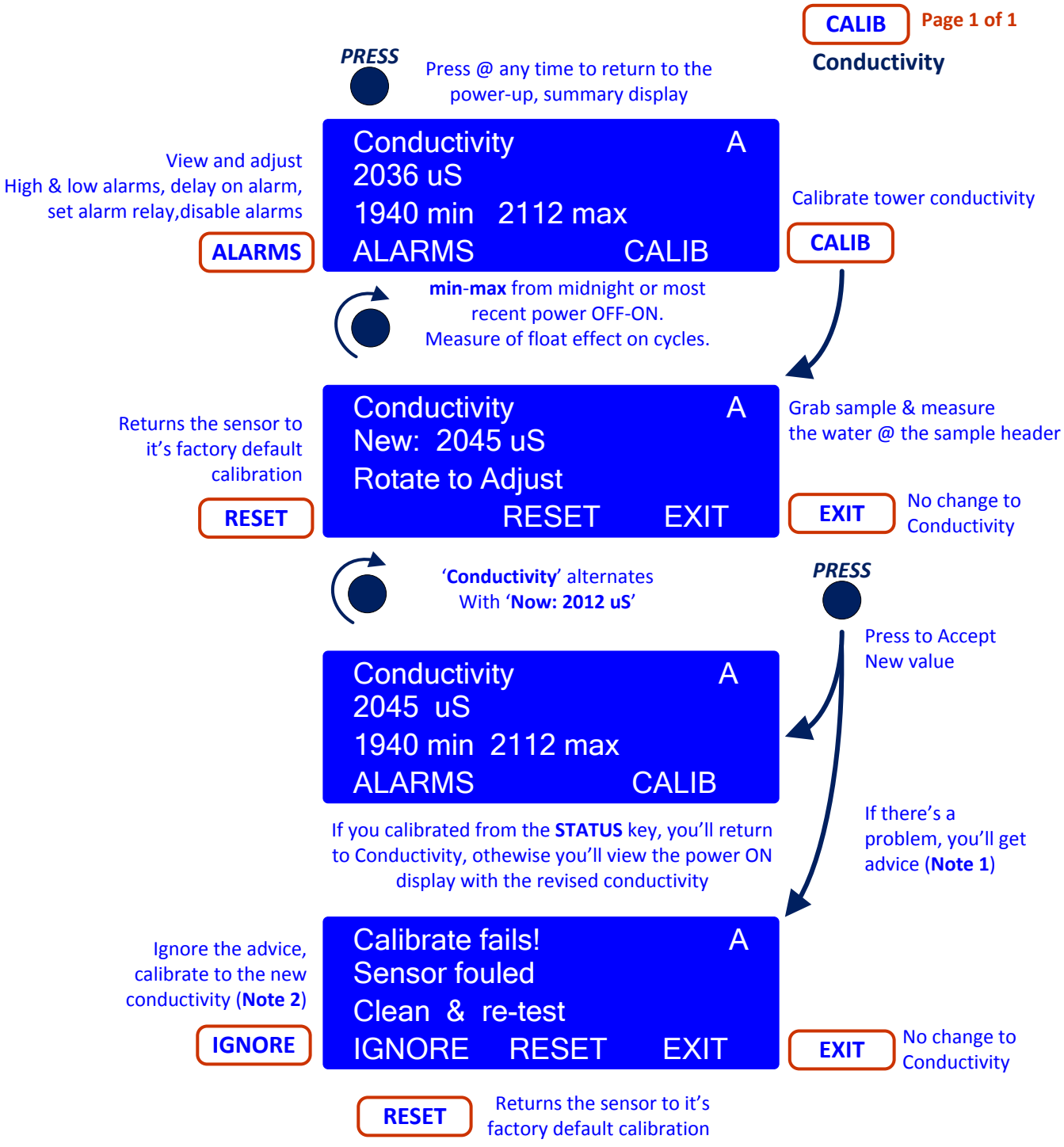
NOTE: In this example, the Bleed Solenoid is controlled by a conductivity sensor. Other control methods may have more than 1 setpoint.

2. Adjust Setpoints



NOTE: In this example, the Inhibitor Pump is controlled by a water meter, turning ON for 26 seconds for every 125 Gallons measured.

3. Calibrate



Note 1.
Advice varies with both sensor type and correction required to get to the user calibration value.

Note 2.
Fouled or filmed conductivity sensor may not track the tower conductivity & may indicate a make-up water chemistry change or feed-control problems

4. Adjust Alarms

ALARMS Page 1 of 1

Conductivity

PRESS

Press @ any time to return to the power-up, summary display

View and adjust
High & low alarms, delay on alarm, set alarm relay,disable alarms

ALARMS

Conductivity A
5021 uS
Alarmed High
ALARMS RESET CALIB

RESET Resets an active alarm

CALIB Calibrate conductivity

Rotate to view other I/O

High Alarm A
4000 uS
Press to modify
EXIT

No change to Alarms

EXIT

Press to Modify alternates with **Rotate to View**

Low Alarm A
350 uS
Press to modify
EXIT

Press to Modify alternates with **Rotate to View**

Delay on Alarm A
5.0 min
Press to modify
EXIT

Use **Delay on Alarm** to block alarms on transient operating conditions & nuisance alarms

Press to Modify alternates with **Rotate to View**

Alarms A
Enabled
Press to modify
EXIT

Turns OFF High & Low alarms. Stops alarming on this sensor

Press to Modify alternates with **Rotate to View**

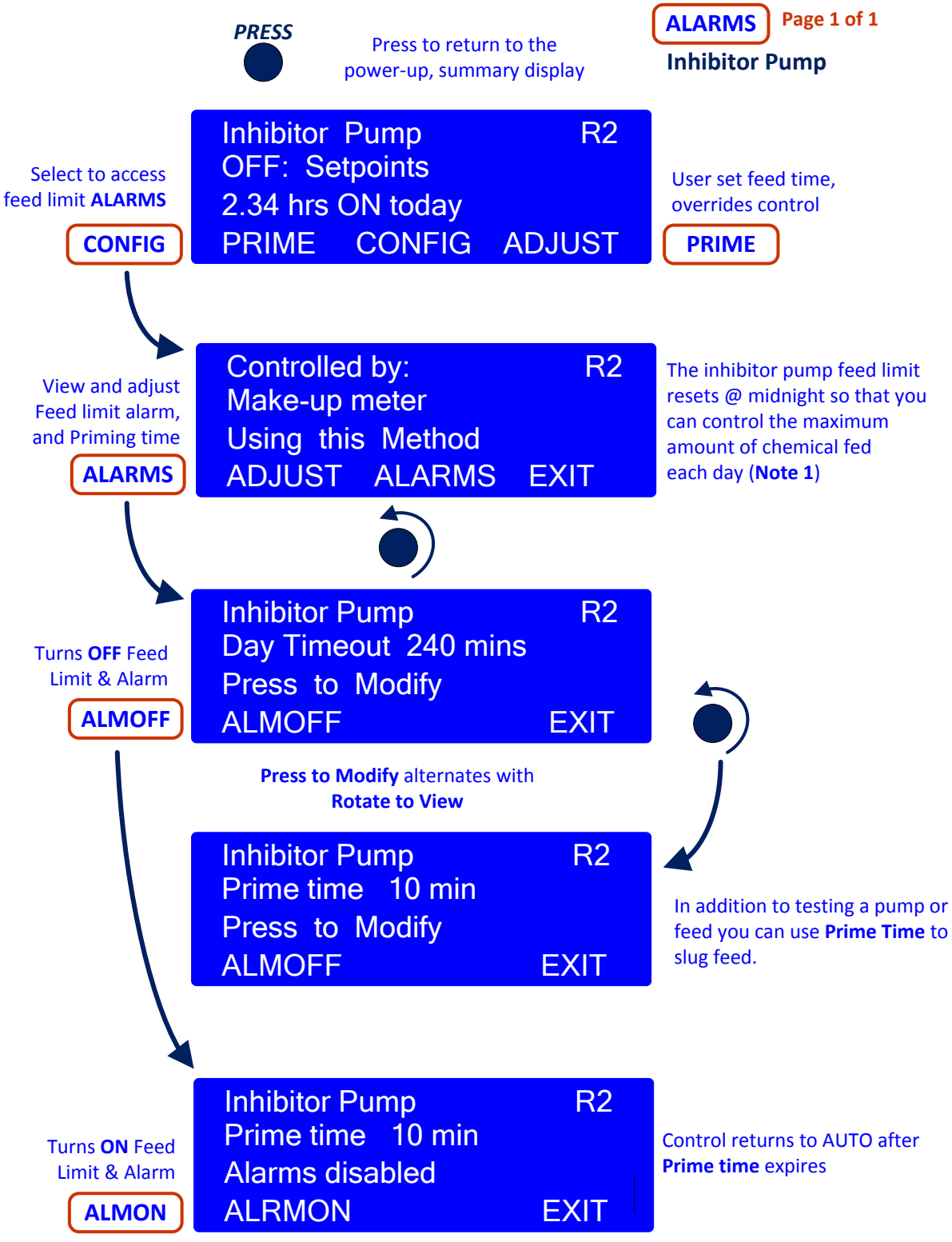
Alarm Relay A
ON
Press to modify
EXIT

When alarm occurs, turns ON Relay 5, Alarm Relay.
(No effect if Relay 5 is not an Alarm Relay)

4. Adjust Alarms

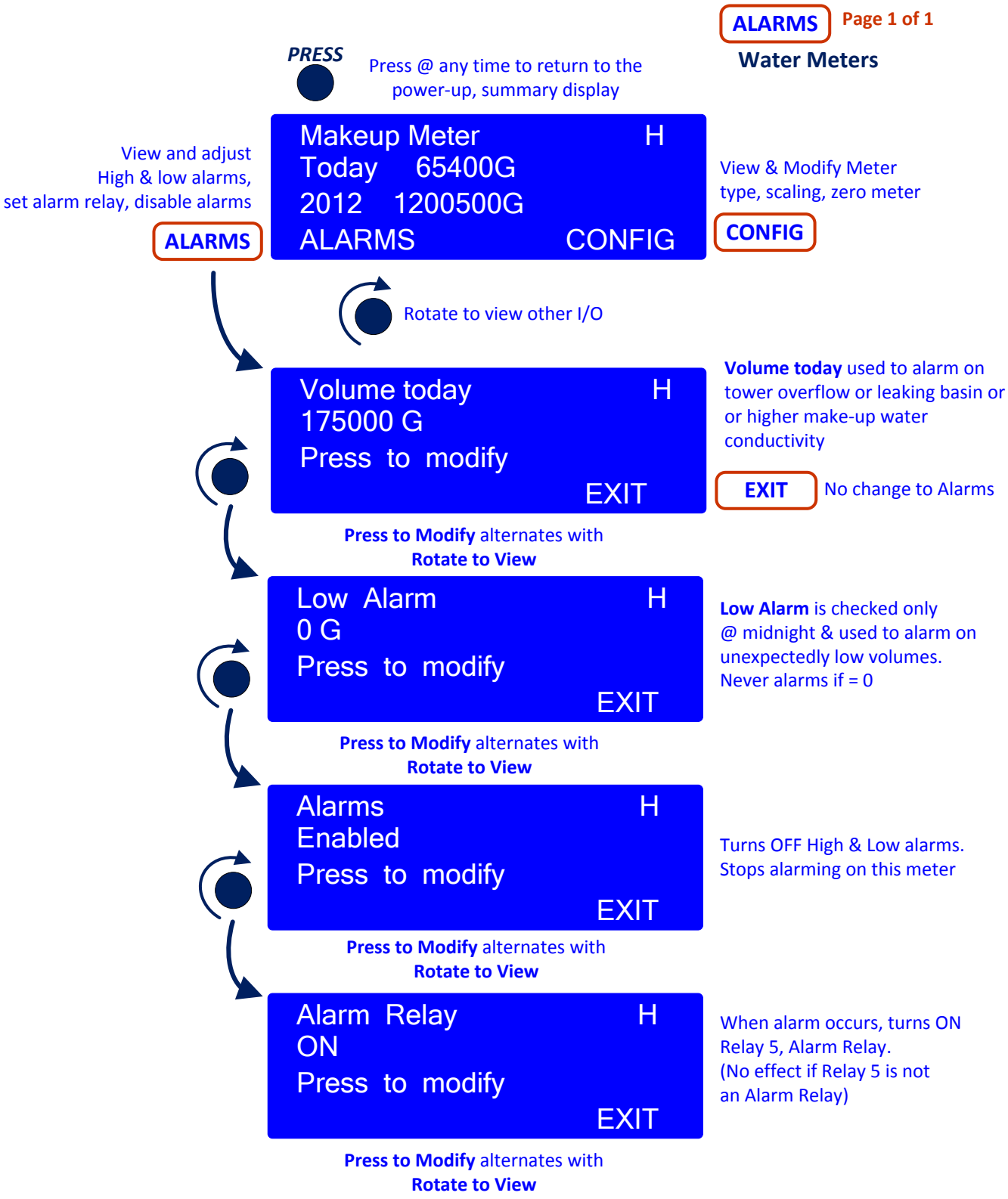
ALARMS Page 1 of 1

Inhibitor Pump



Note 1.
The Inhibitor pump feed limit defaults to OFF on alarm & setting the Alarm Relay (if Relay 5 is used as an alarm relay) on limit. However these defaults may be modified or have been modified using the browser interface or the on-line Plug&Feed app.

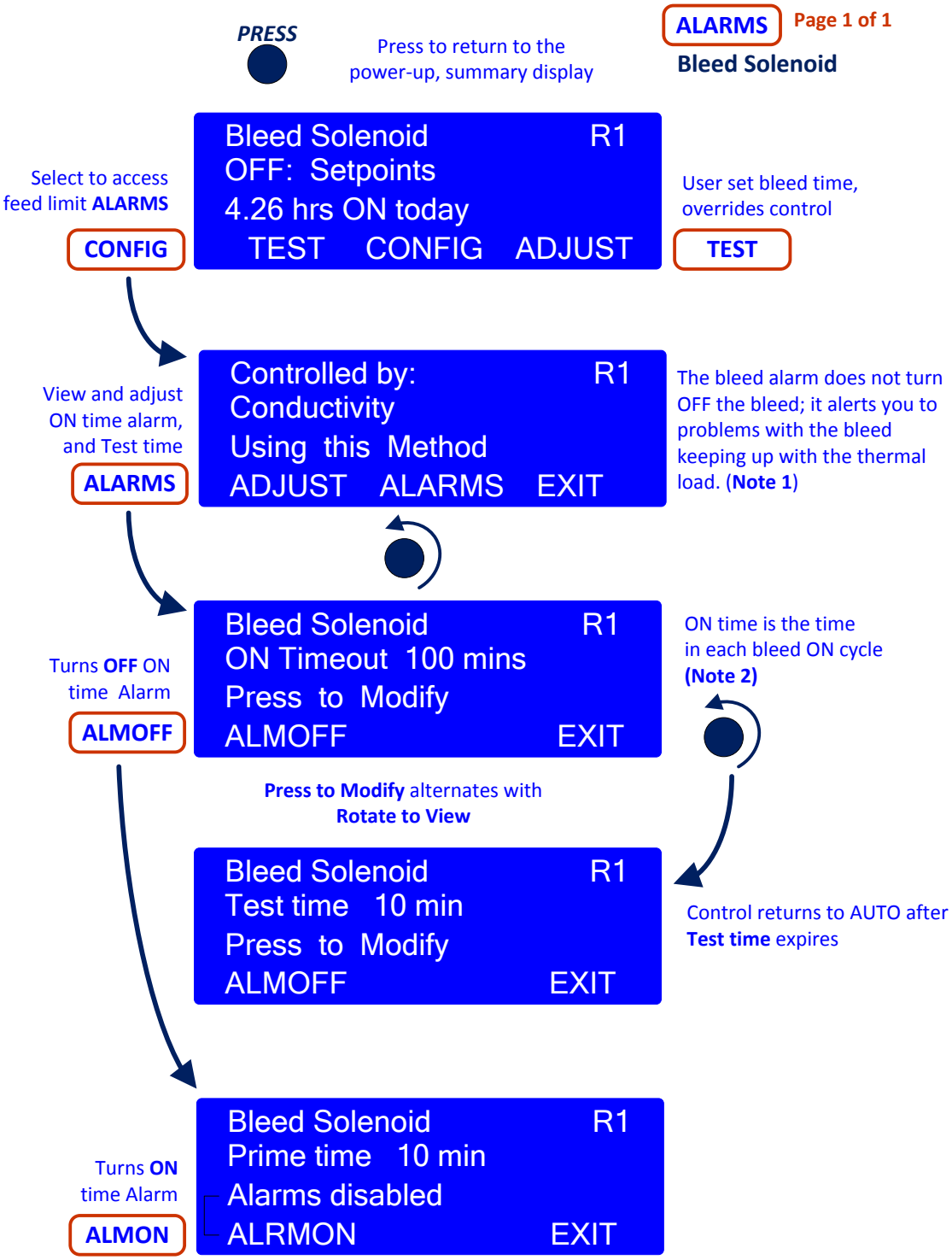
4. Adjust Alarms



4. Adjust Alarms

ALARMS Page 1 of 1

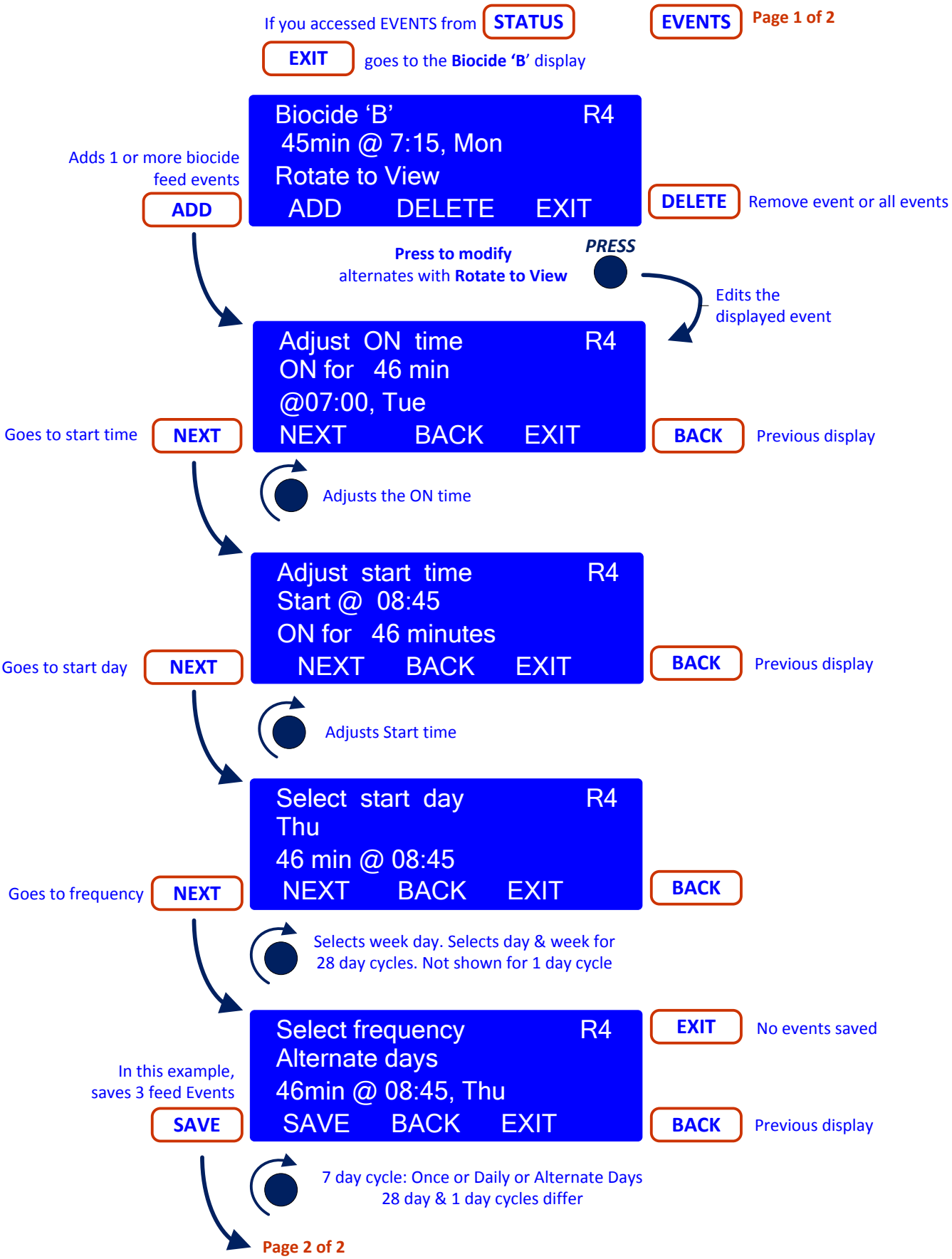
Bleed Solenoid



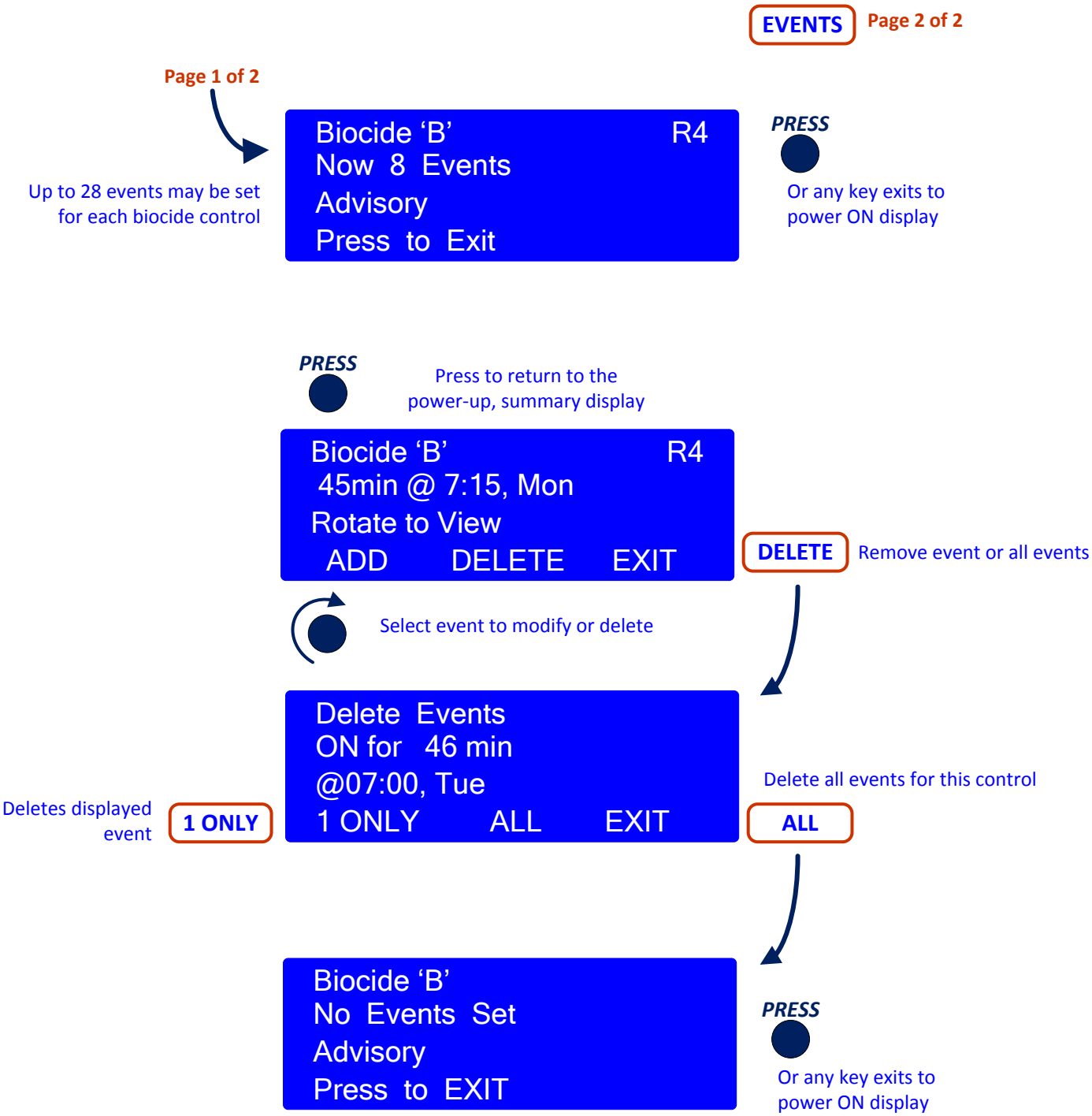
Note 1.
The bleed ON time limit defaults to ON on alarm & setting the Alarm Relay (if Relay 5 is used as an alarm relay) on limit. However these defaults may be modified or have been modified using the browser interface or the on-line Plug&Feed app.

Note 2.
ON time alarms are used for Oxidant, pH Controls & Timed Event, Biocide Controls. Usually disabled on Biocide controls, they cannot be disabled on pH controls.

5. Biocide Events



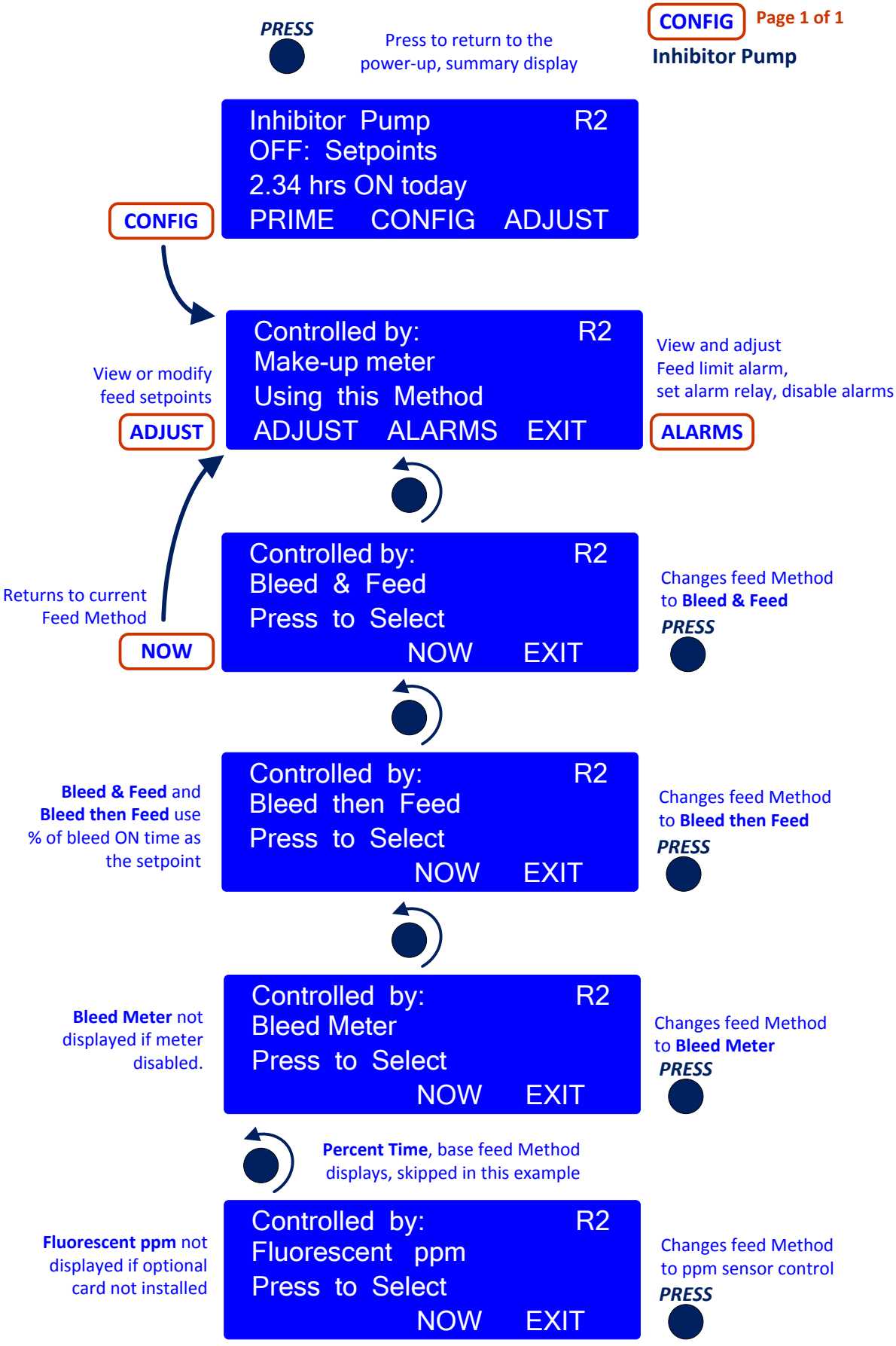
5. Biocide Events



6. Configure

CONFIG Page 1 of 1

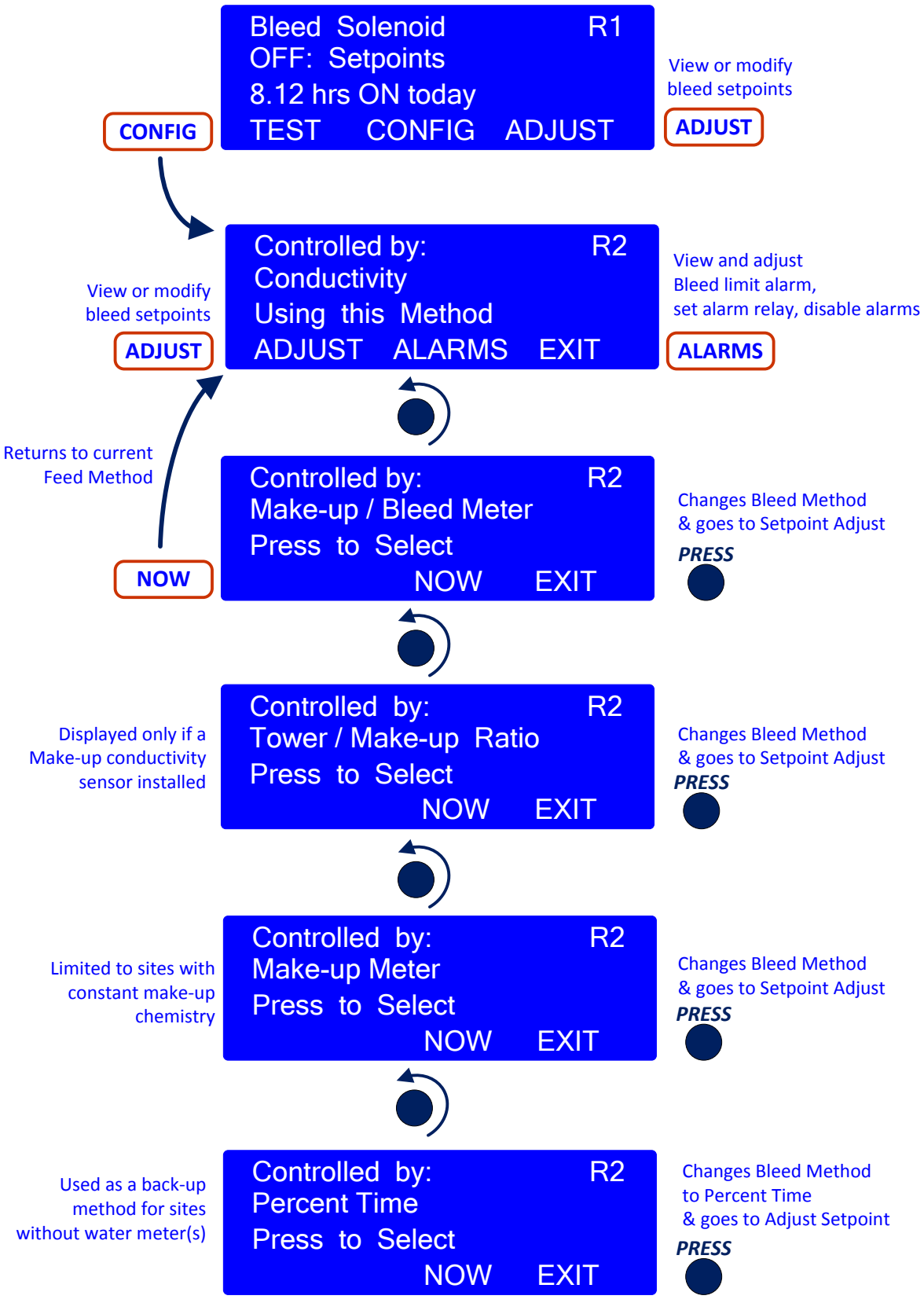
Inhibitor Pump



6. Configure

CONFIG Page 1 of 1

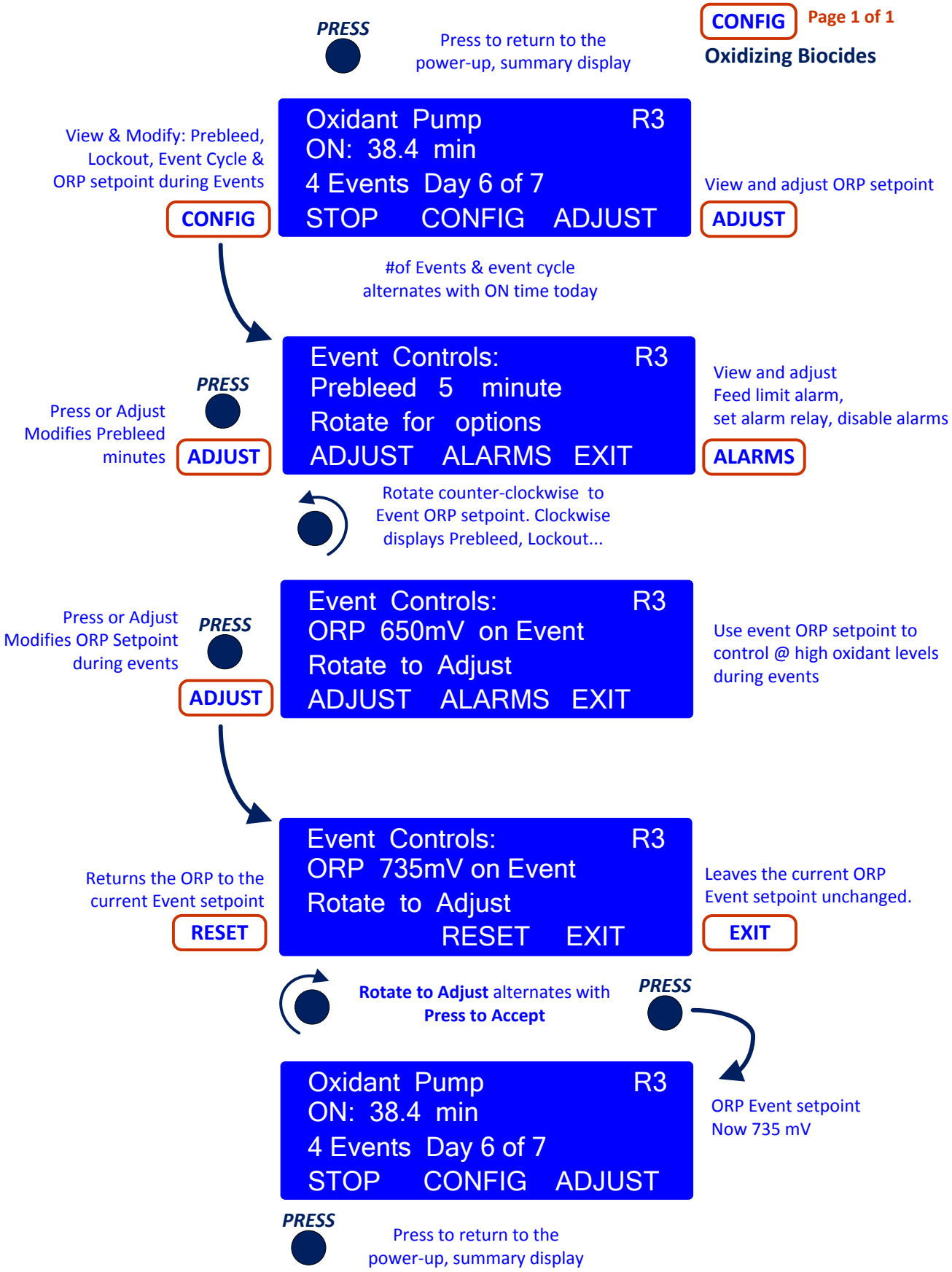
Bleed Solenoid



6. Configure

CONFIG Page 1 of 1

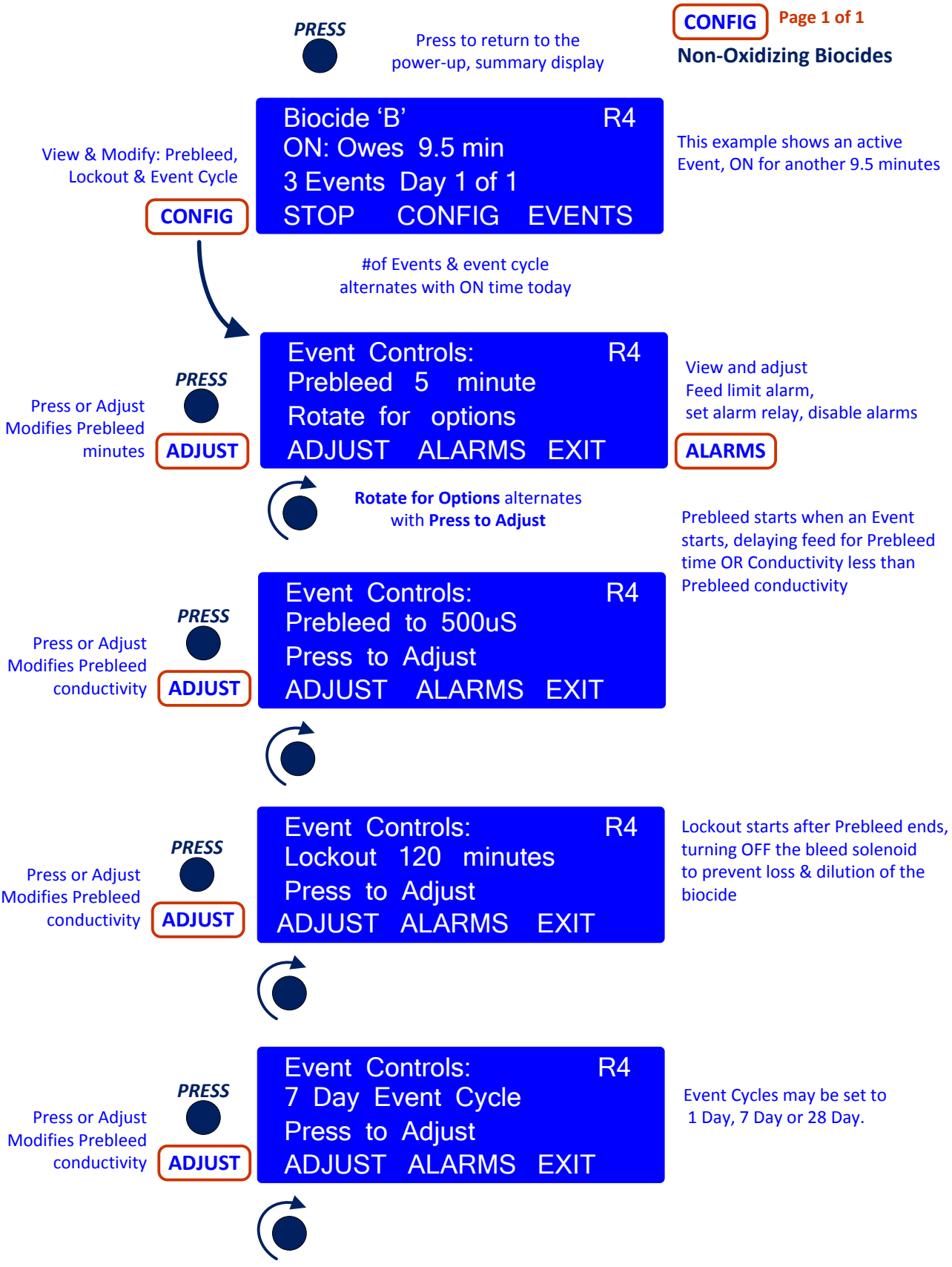
Oxidizing Biocides



6. Configure

CONFIG Page 1 of 1

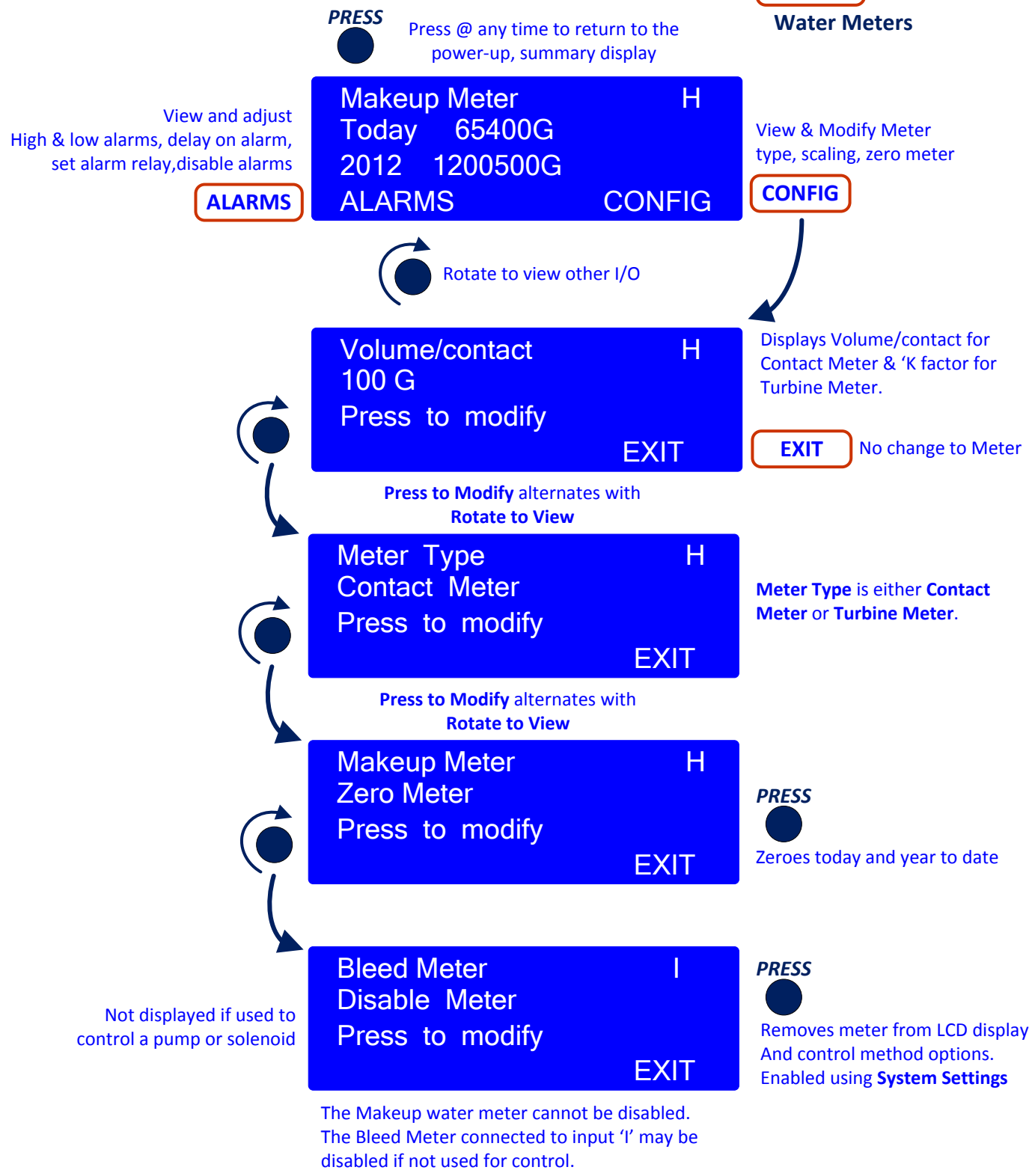
Non-Oxidizing Biocides



6. Configure

CONFIG Page 1 of 1

Water Meters



7. 4-20mA Outputs

CONFIG Page 1 of 1

4-20mA Outputs

4-20mA outputs are Optional & may not be installed in your ProMtrac

PRESS

Press @ any time to return to the power-up, summary display

Turns OFF AUTO **MANUAL**

View & select the sensor and its 4mA & 20mA setpoints **CONFIG**

```
4-20mA Out #2          E
11.2mA  44.8%
    514uS  AUTO
MANUAL  CONFIG  VERIFY
```

Set to 20mA(span) or 4mA(zero) & adjust span or zero **VERIFY**

Displays loop current and % of full span and controlling sensor value with mode

```
4-20mA Out #2          E
20mA =   1150uS
Press to modify
                  EXIT
```

The 20mA value is displayed with controlling sensor units & resolution.

EXIT No change to 4-20mA

Press to Modify alternates with **Rotate to View**

```
4-20mA Out #2          E
4mA =  0uS
Press to modify
                  EXIT
```

The 4mA sensor value may be more or less than the 20mA value. The 4-20mA output may be set to increase or decrease with changing sensor value

Press to Modify alternates with **Rotate to View**

```
Control by:
Conductivity
Press to modify
                  EXIT
```

Any installed sensor including 'Manual Input' may be selected to control either of the 4-20mA outputs

Press to Modify alternates with **Rotate to View**

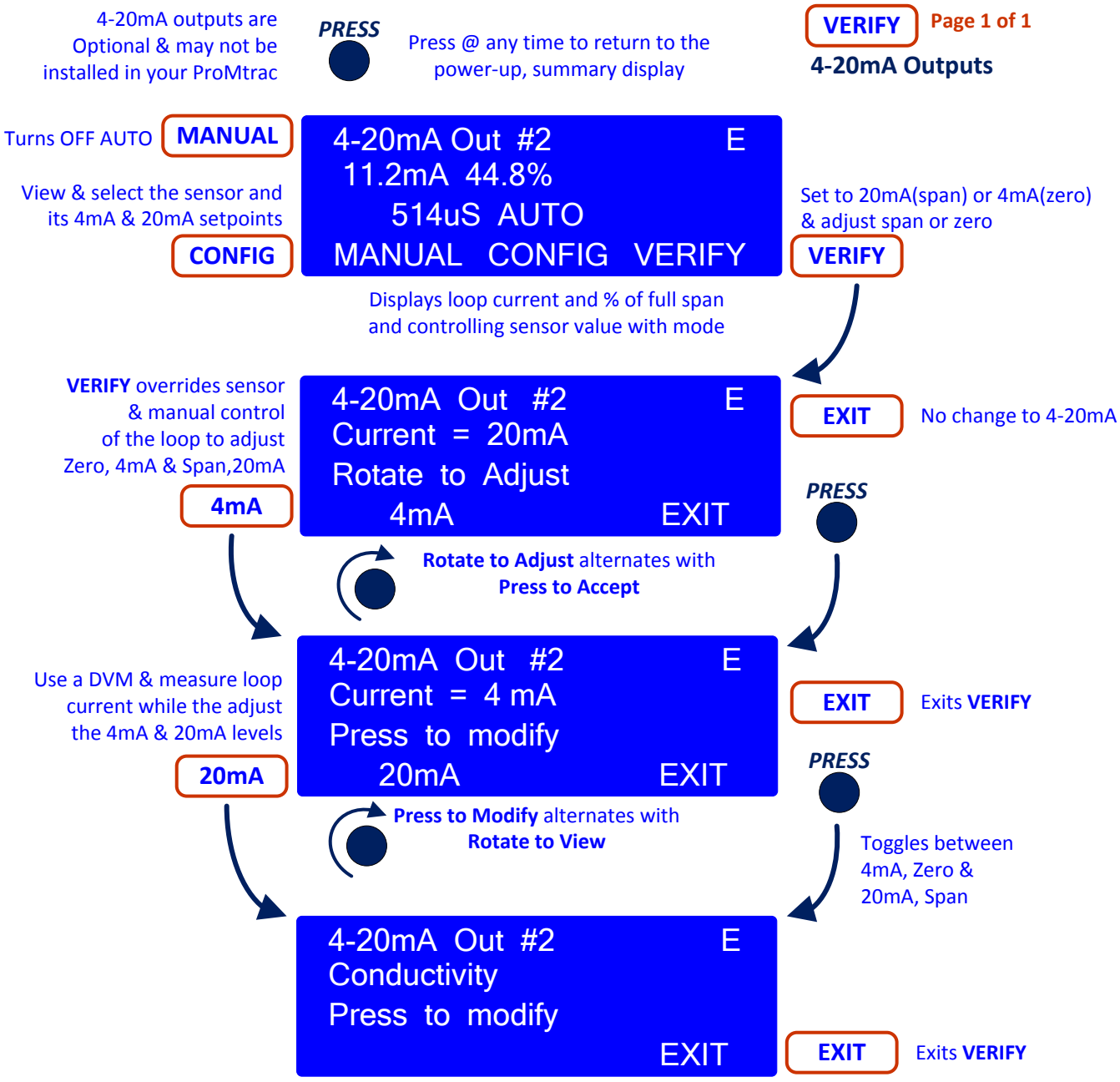
MANUAL is useful when commissioning, allowing you to set the loop to 0%, 50% & 100% to verify that the terminating end of the loop is measuring the correct loop current

```
4-20mA Out #2          E
Manual  60.0 %
Press to modify
                  EXIT
```

When **MANUAL** is selected, the 4-20mA output goes to the user selected current 0-100% = 4-20mA

Press to Modify alternates with **Rotate to View**

7. 4-20mA Outputs

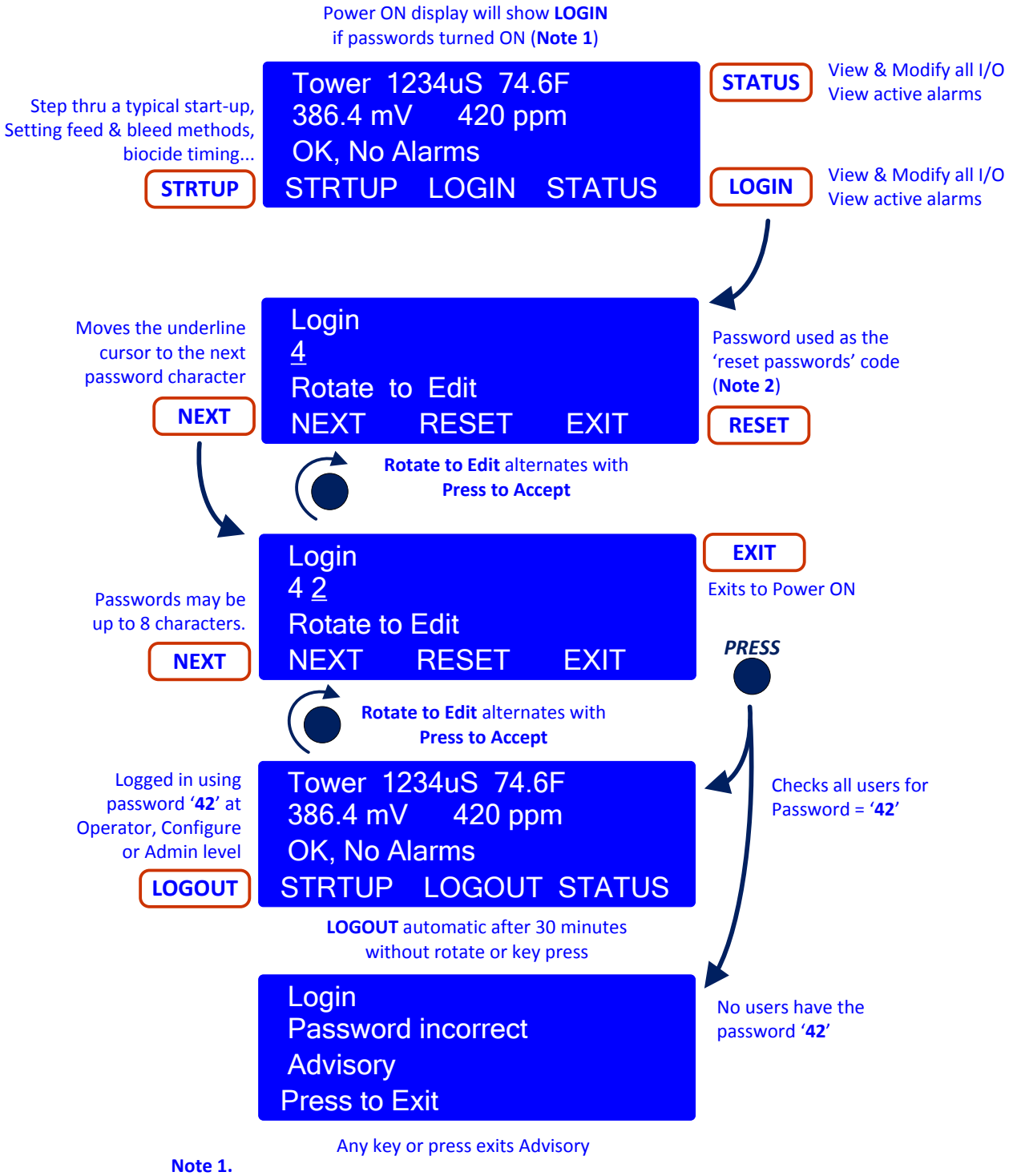


Note.
The ProMtrac powers the 4-20mA loop and the current loop return is connected to the PromTrac control common which is connected to electrical ground.
This loop powering method is unlikely to create a ground loop for loops terminated @ a single monitoring DCS or BAS.

8. Passwords

LOGIN

Page 1 of 1

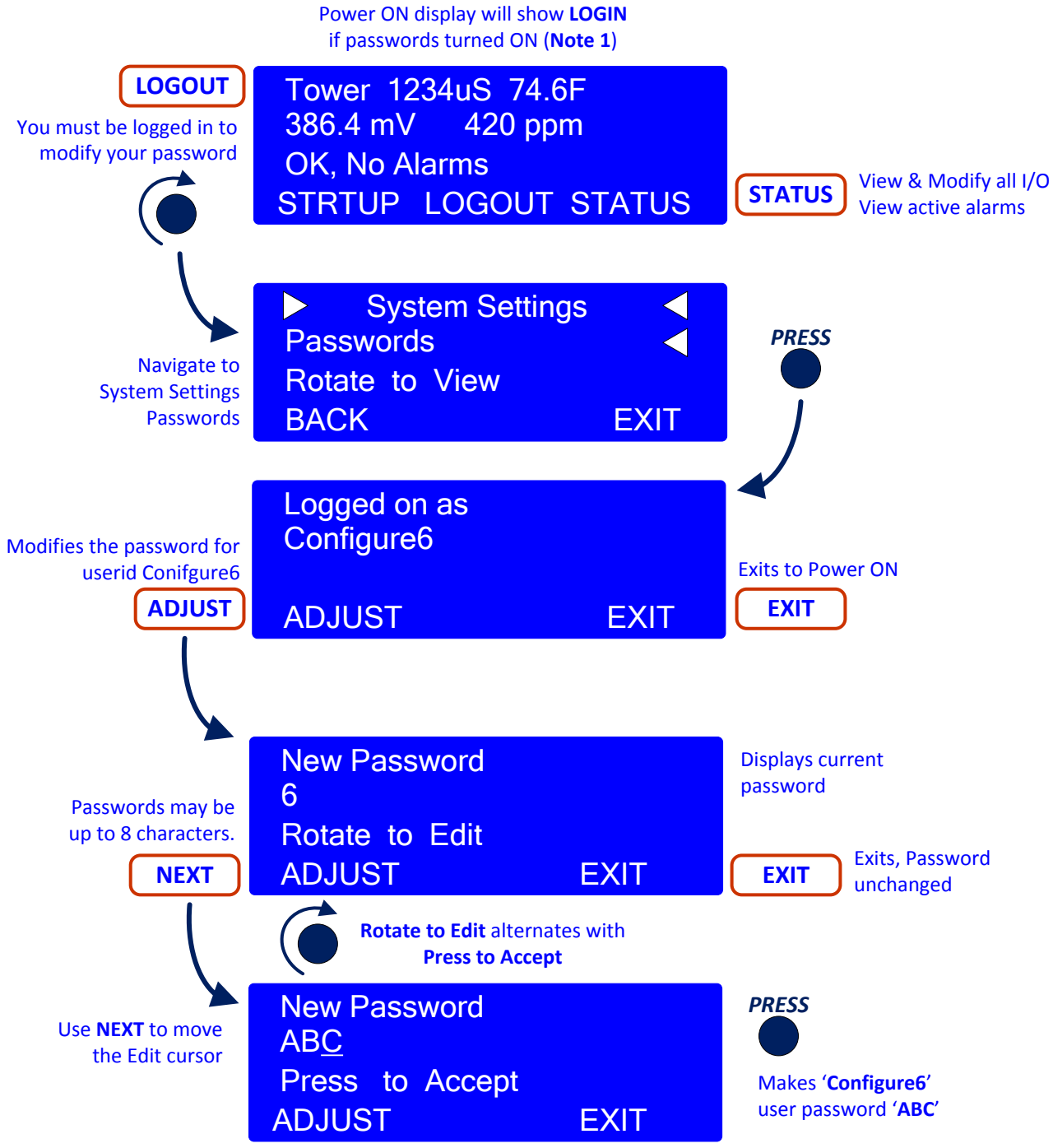


Note 1.
You do not have to **LOGIN** to view I/O values.
When you attempt to modify the controller, you'll be prompted for a password, if passwords are ON & you have not logged in.

Note 2.
If you forget passwords, Prominent can supply you with a Reset code locked to your controller Serial Number which will reset all passwords to factory defaults.

8. Passwords

Modify Password

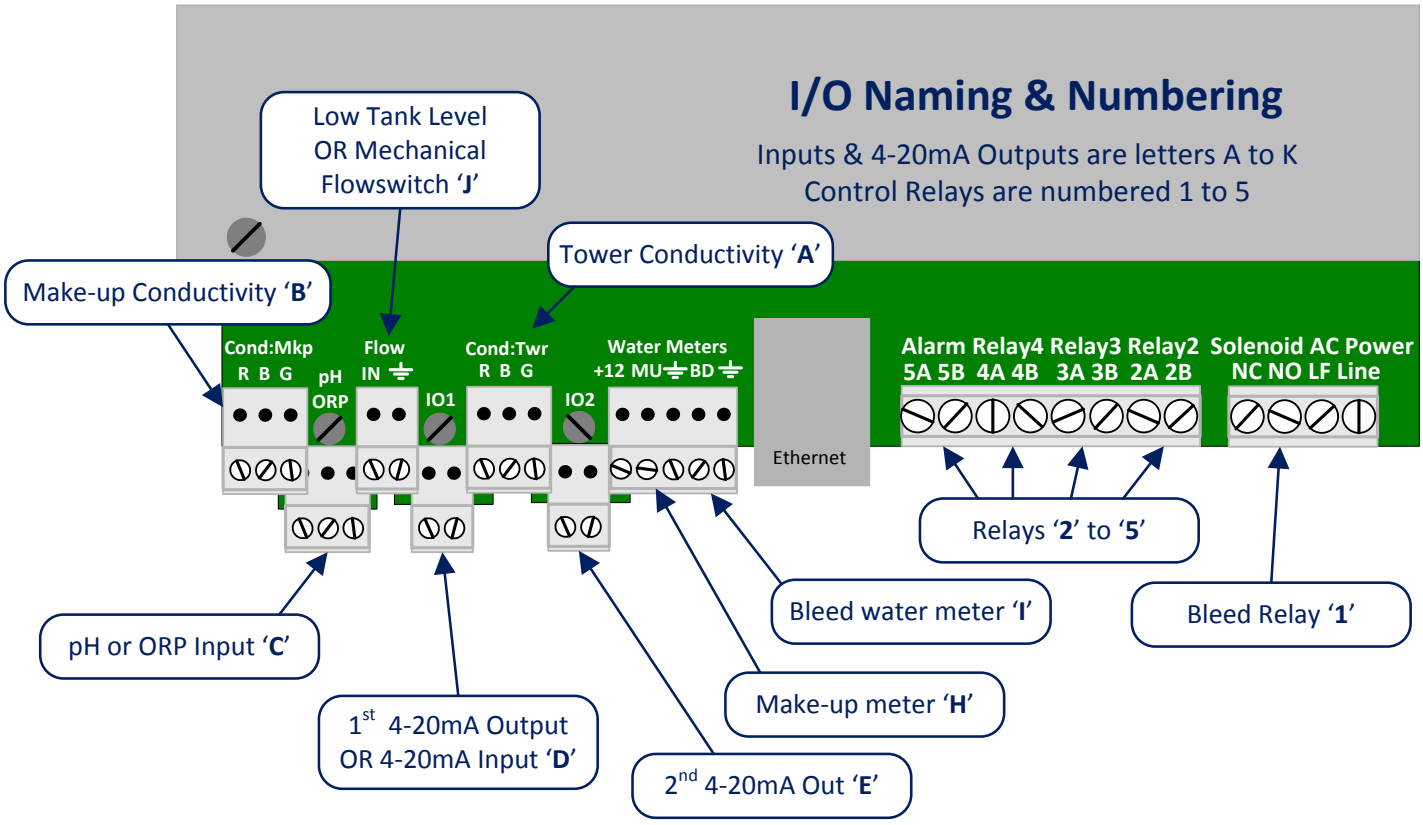


Note.
Browse to modify '**Configure6**' user id.
Passwords cannot contain spaces or HTML characters.
Passwords with lower case characters cannot be entered using the keypad.

9. Wiring

Sensor and controls may be renamed by users. Each I/O is also tagged by a letter, '**A**' to '**K**' for inputs & 4-20mA outputs and numbers '**1**' to '**5**' for control relays so that wiring locations can be connected to user I/O names.

Sensors **A**:Conductivity, **F**:Temperature, & **H**:Make-up Meter exists in every ProMtrac controller.
Sensors: **B**:Make-up Conductivity, **C**:pH or ORP, **D**:4-20mA Input or Output, **E**:4-20mA Output are optional sensors
Sensors: **G**: Manual Input, **I**: Bleed Meter & **J**:Tank Level switch may be user enabled-disabled.
Sensor: **K**:Thermal Flowswitch may be disabled by making **J** the flowswitch.



Manual Input '**G**'

Input 'G' may be used for the result of a chemical test, hardness, ppm... it's logged and alarmed like any other sensor value

Water Temperature '**F**'

Thermal Flowswitch '**K**'

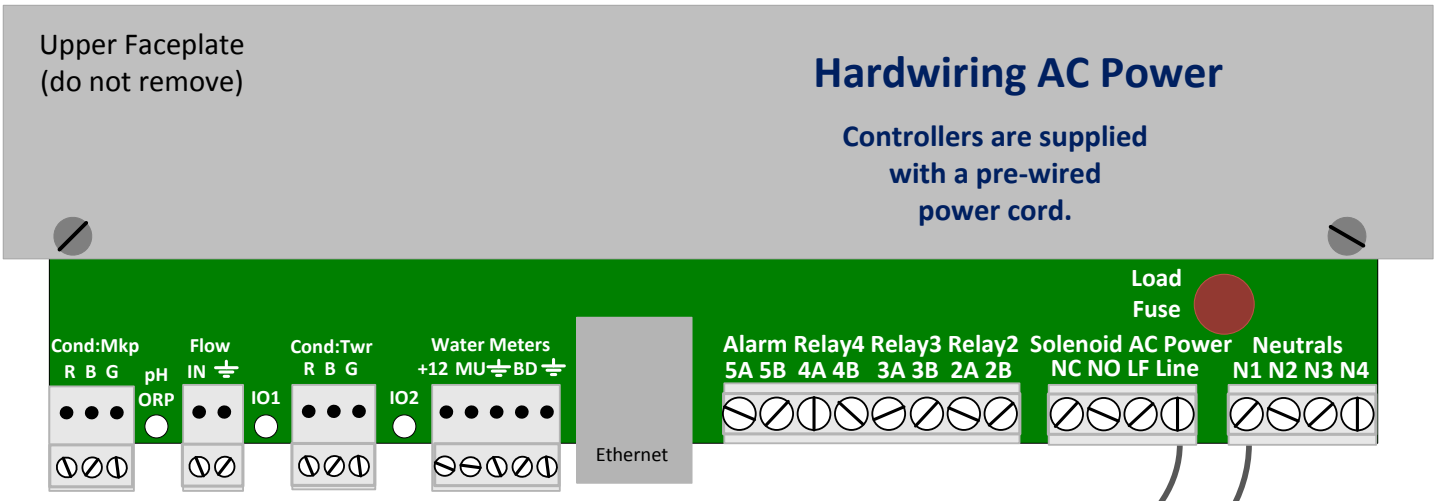
Inputs '**F**' & '**K**' are part of the data stream from the digital tower conductivity sensor connected to input '**A**'. They are individually logged & alarmed.

9. Wiring

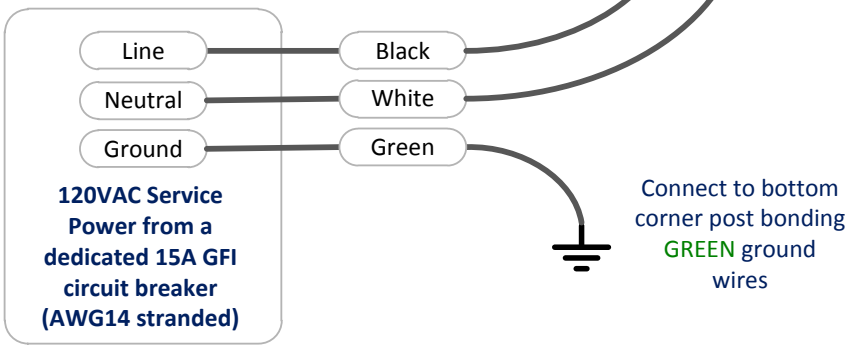
Open the enclosure door, unplug the power cord & remove the lower faceplate:

North American ProMtracs are supplied with a prewired power cord & 120VAC for the bleed solenoid and 3 or 4 pumps.

Alarm relay #5 may be used for control, as a 120VAC switch on alarm, or as a dry contact alarm relay.



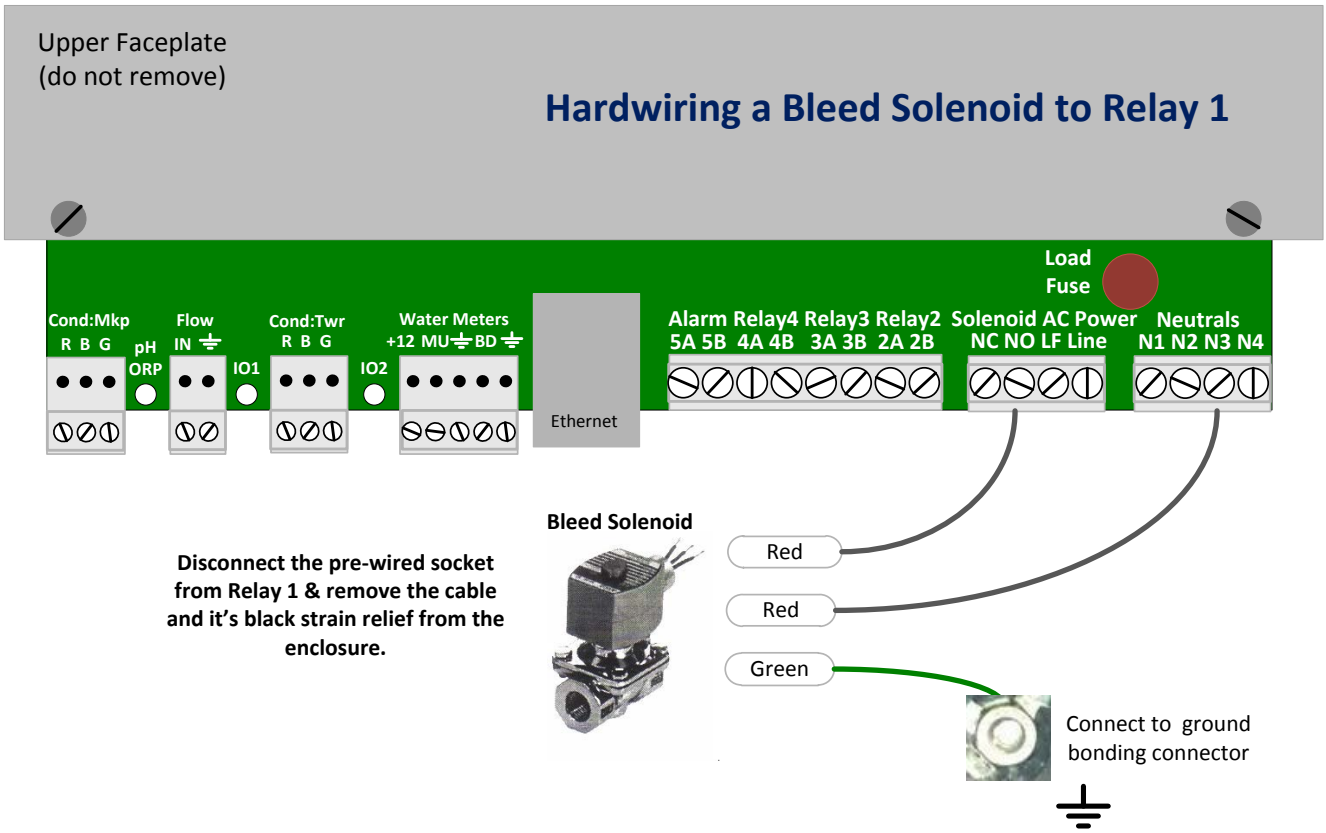
Hint: Use a wire ring lug connector to bond the AC ground to other **GREEN** ground wires

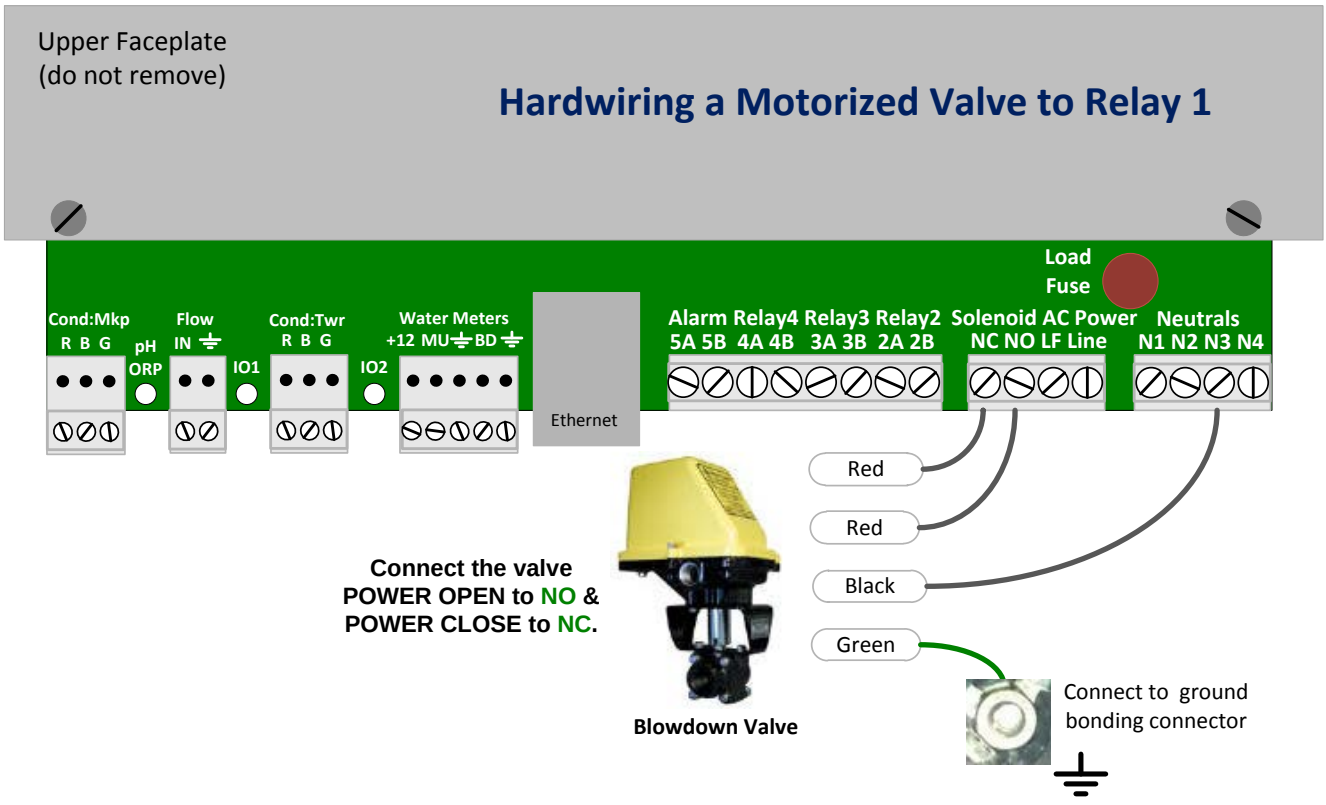


Hint:
use a wire ring lug connector to bond the AC ground to other GREEN ground wires

9. Wiring

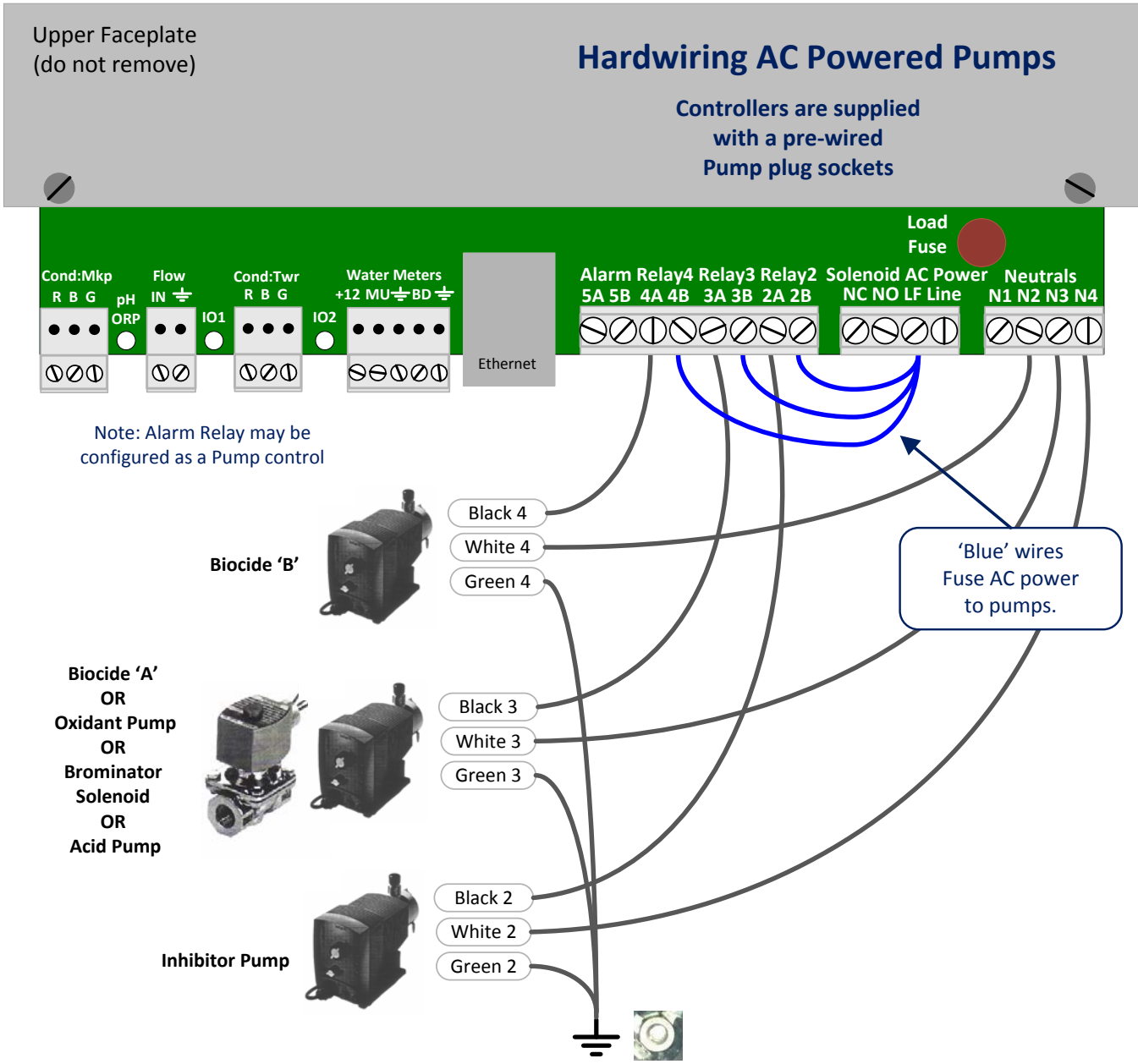
Open the enclosure door, unplug the power cord & remove the lower faceplate:





9. Wiring

Open the enclosure door, unplug the power cord & remove the lower faceplate.
If relay 5 is not used as an alarm relay, it may be reconfigured to control a pump.



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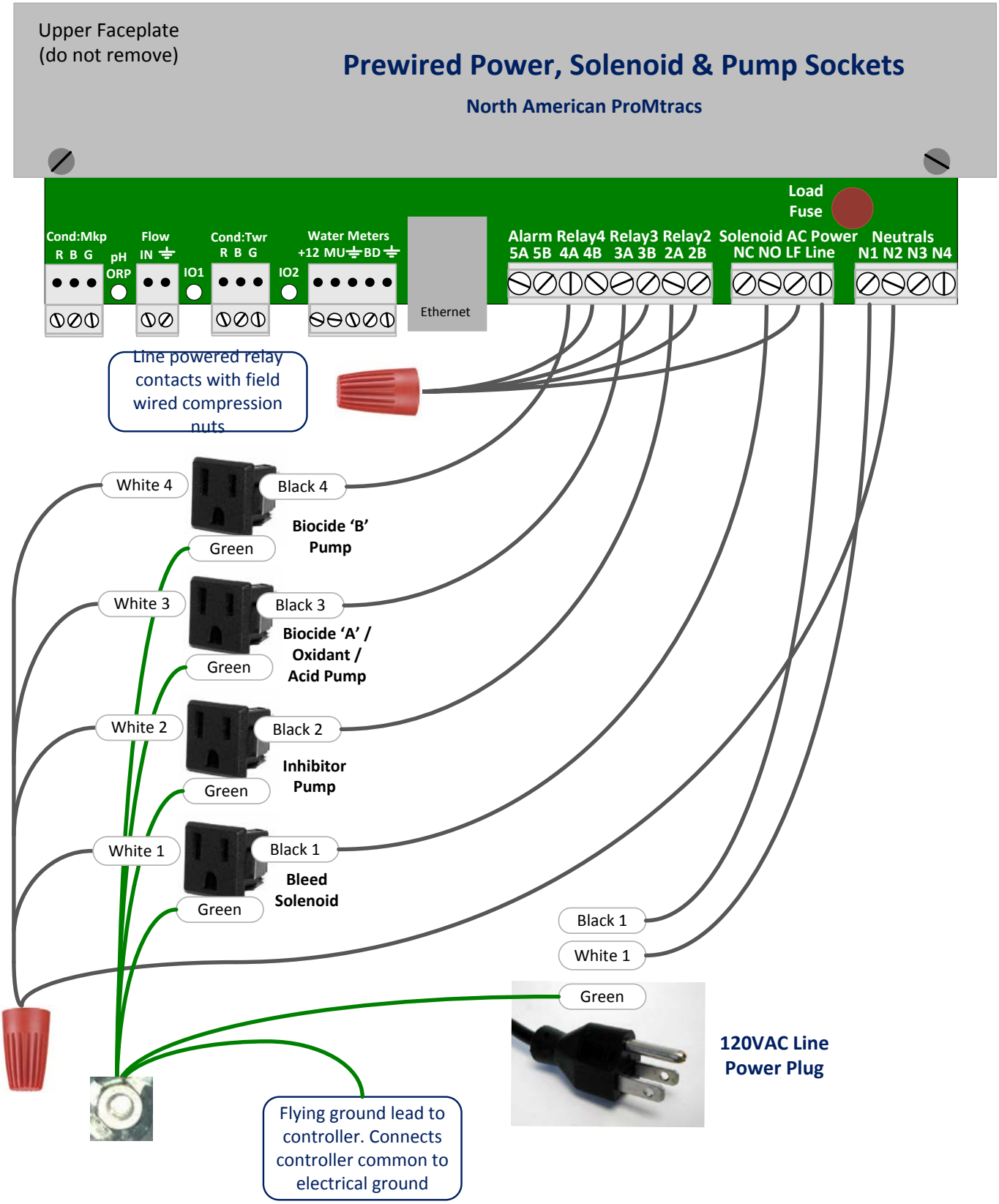
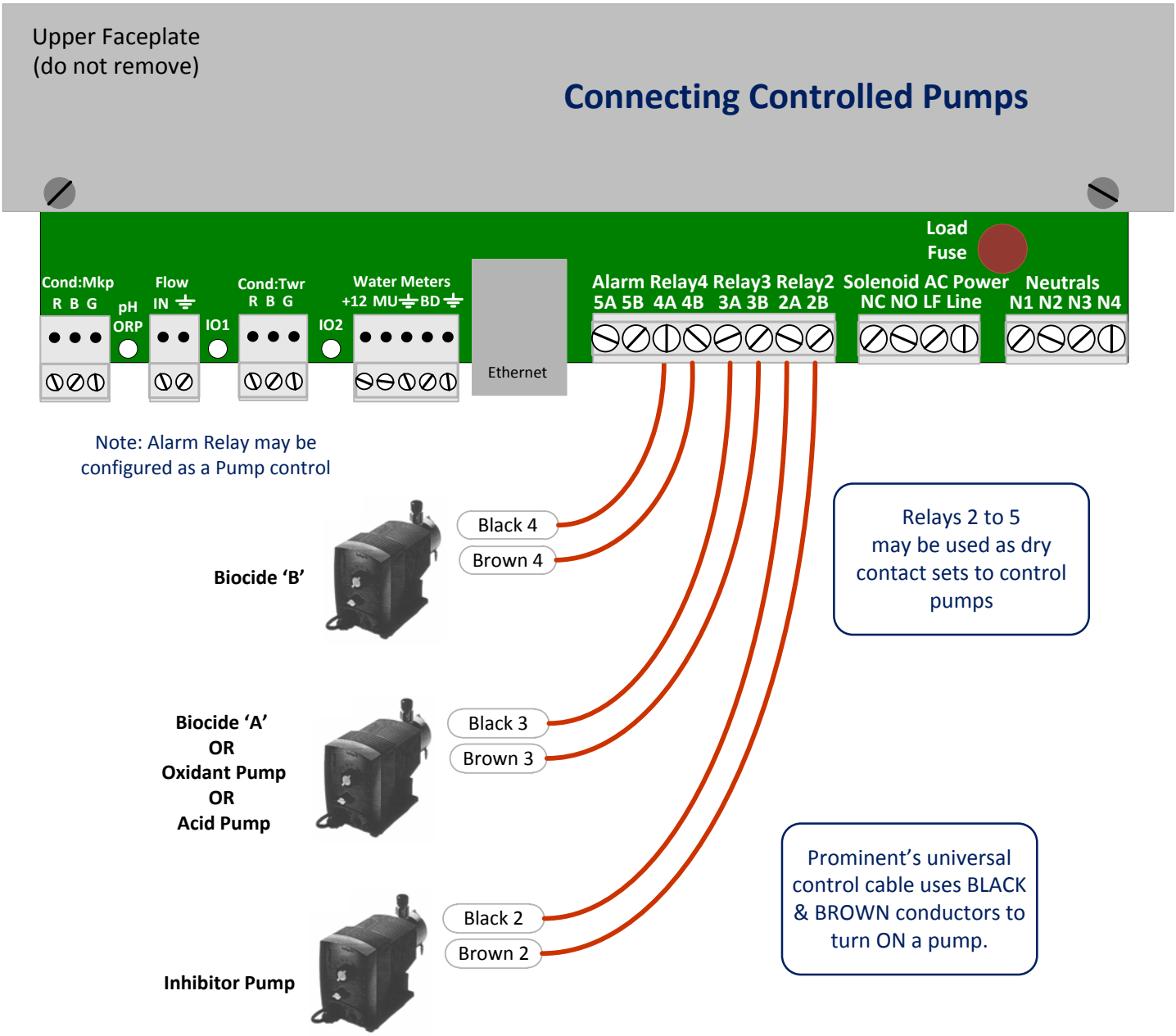
Open the enclosure door, unplug the power cord & remove the lower faceplate.
If relay 5 is not used as an alarm relay, it may be reconfigured to control a pump.



10. Dry Contact Pump Wiring

Open the enclosure door, unplug the power cord & remove the lower faceplate:
If relay 5 is not used as an alarm relay, it may be reconfigured to control a pump.

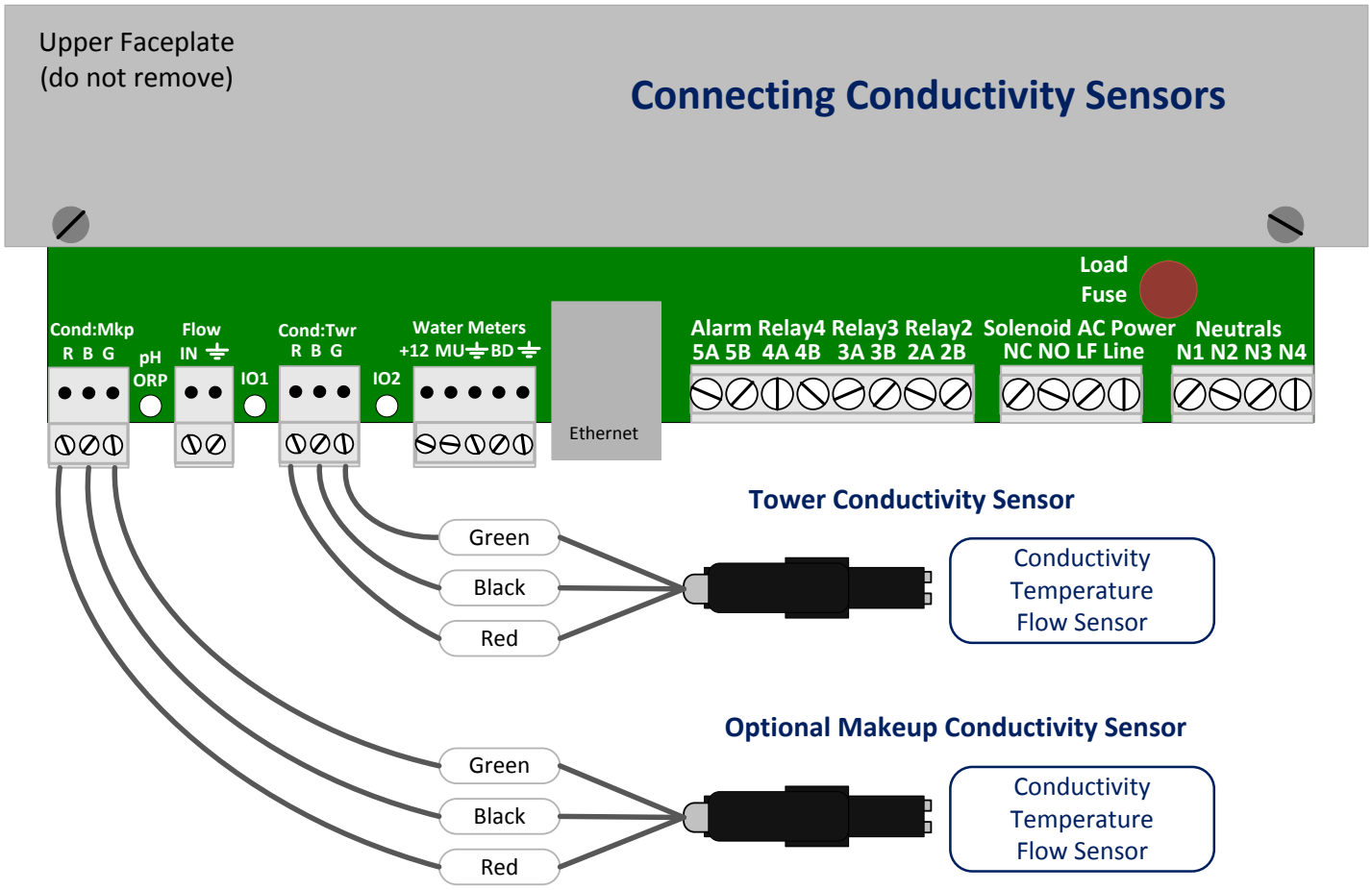


11. Sensor & Water Meter Wiring

Open the enclosure door, unplug the power cord & remove the lower faceplate:

Tower and make-up conductivity sensors are identical & may be interchanged.
PromTracs are typically shipped with the tower sensor connected.

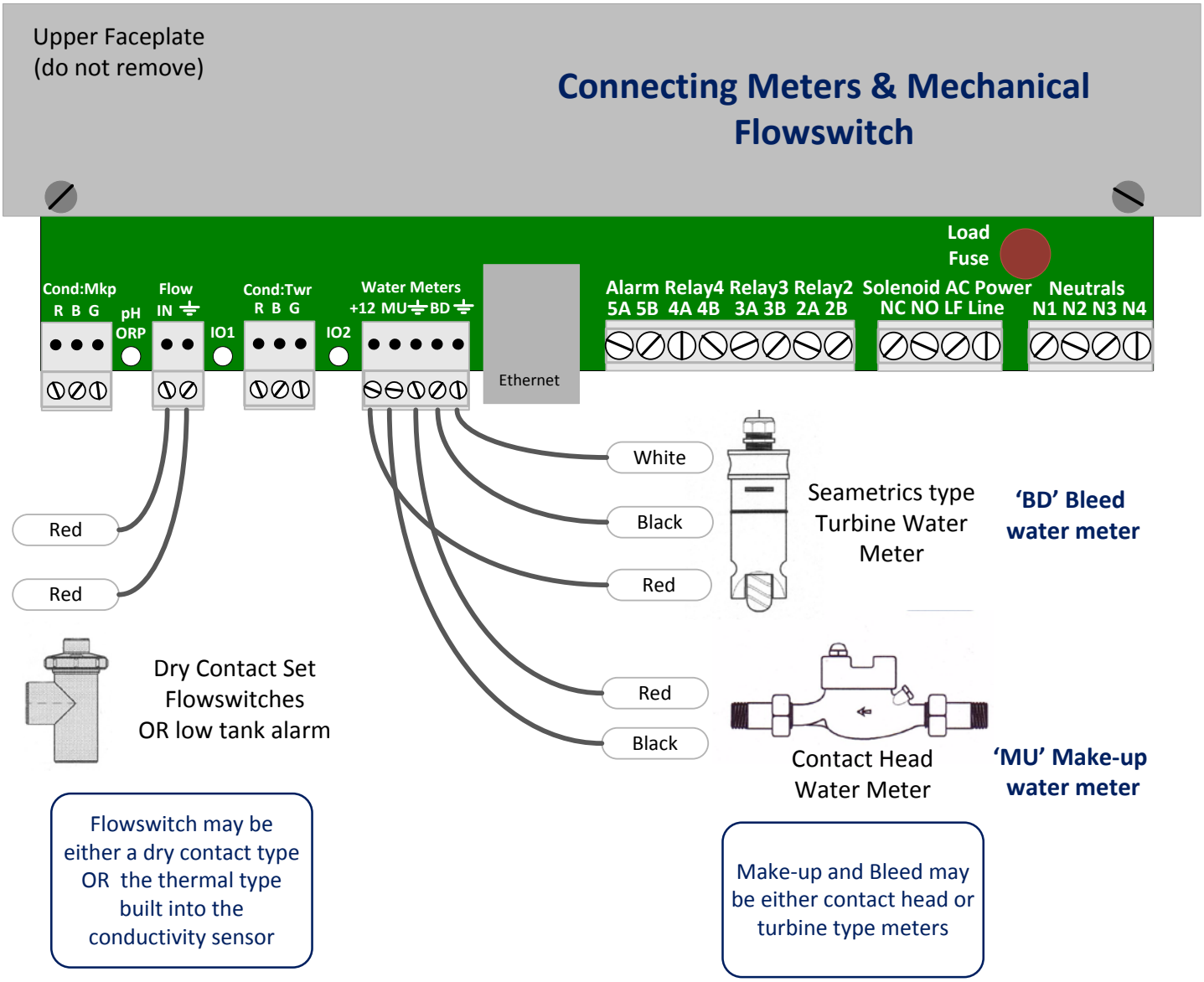
All sensor, meter & 4-20mA in-out terminal blocks are 2 piece.
The block can be removed to make it easier to connect wiring.



11. Sensor & Water Meter Wiring

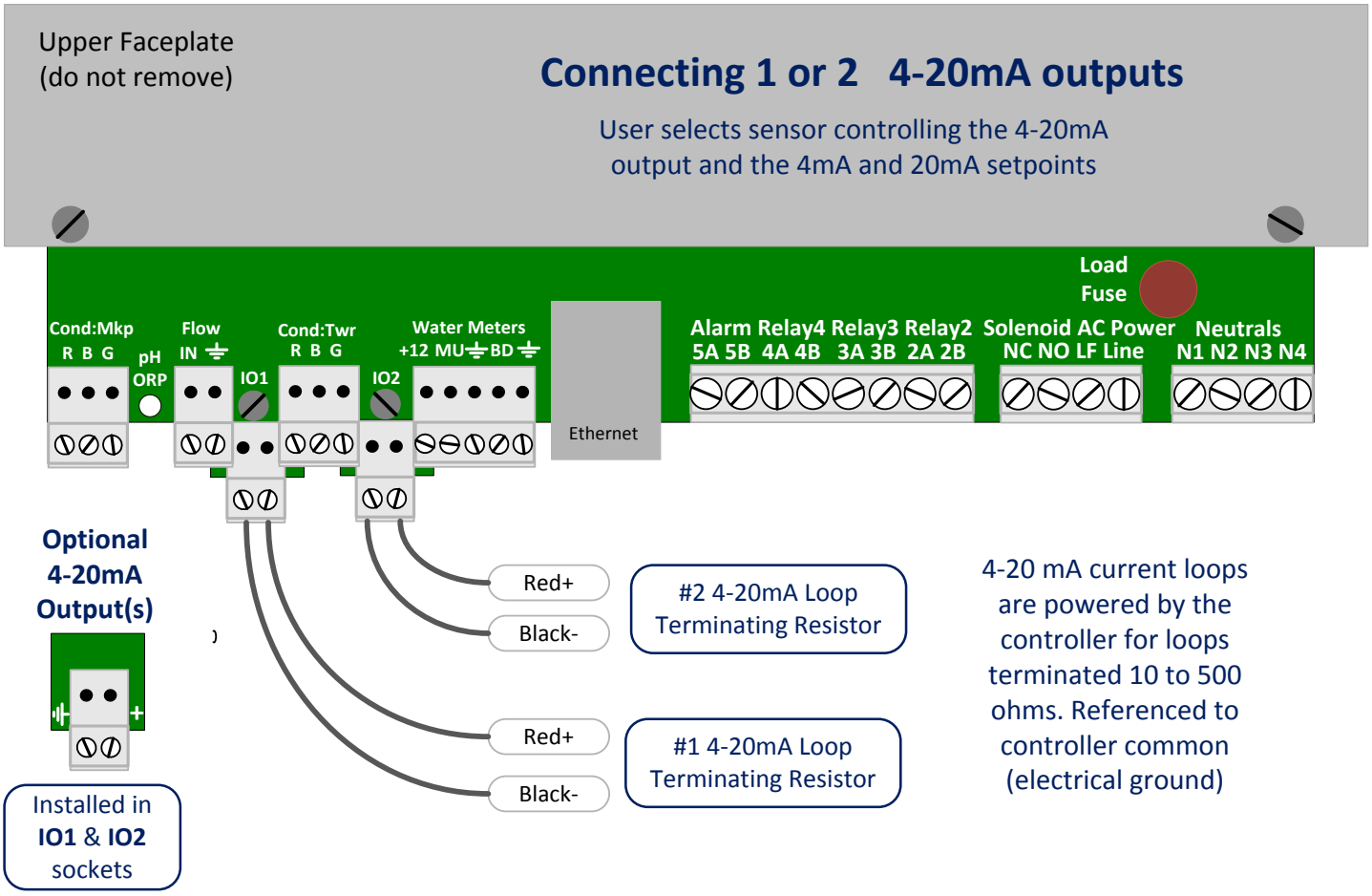
Open the enclosure door, unplug the power cord & remove the lower faceplate:

Flowswitch choice: Users may select to use the thermal flowswitch built into the tower conductivity sensor or a dry contact set connected as shown in the flowing graphic.
Select is a **System Settings / Site Options** (see **1.2 User Menus**).



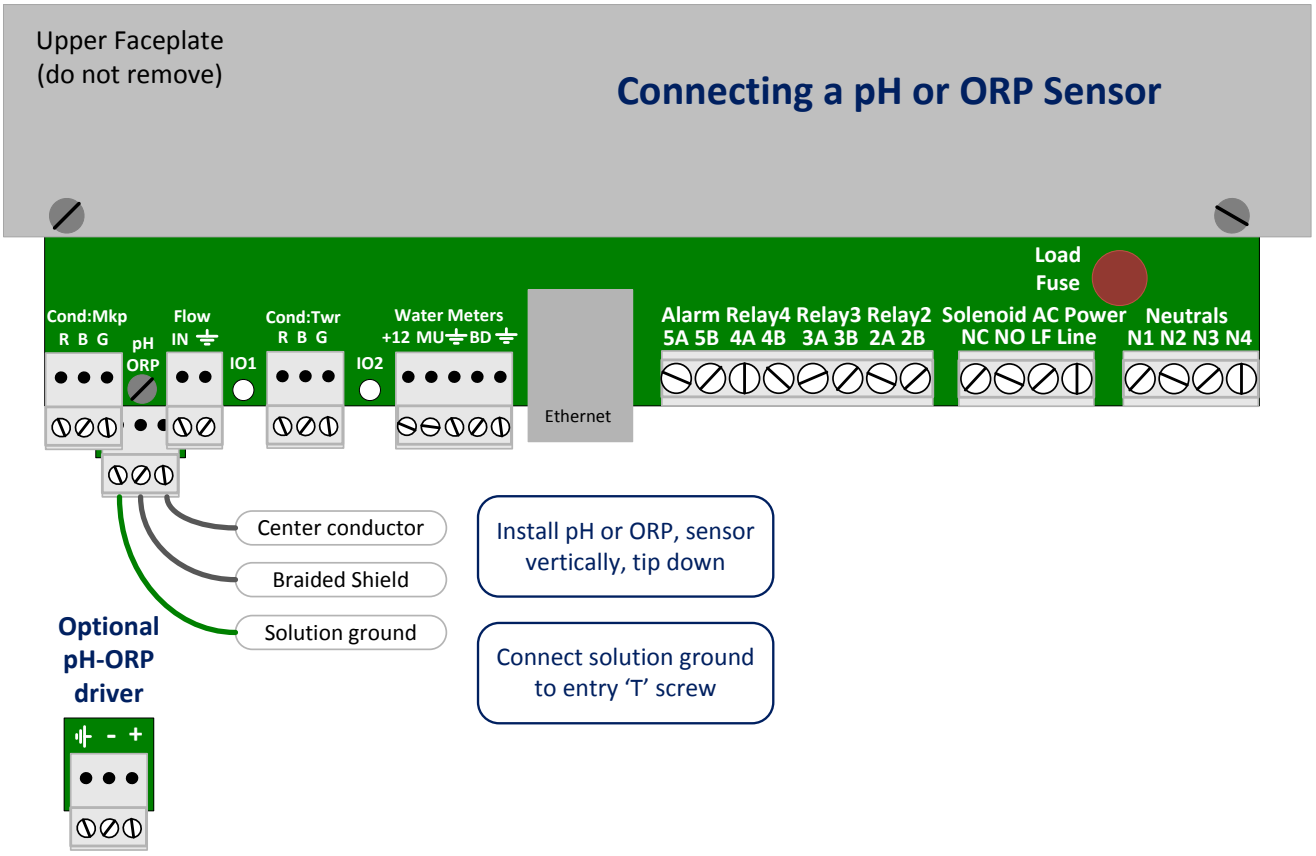
11. Sensor & Water Meter Wiring

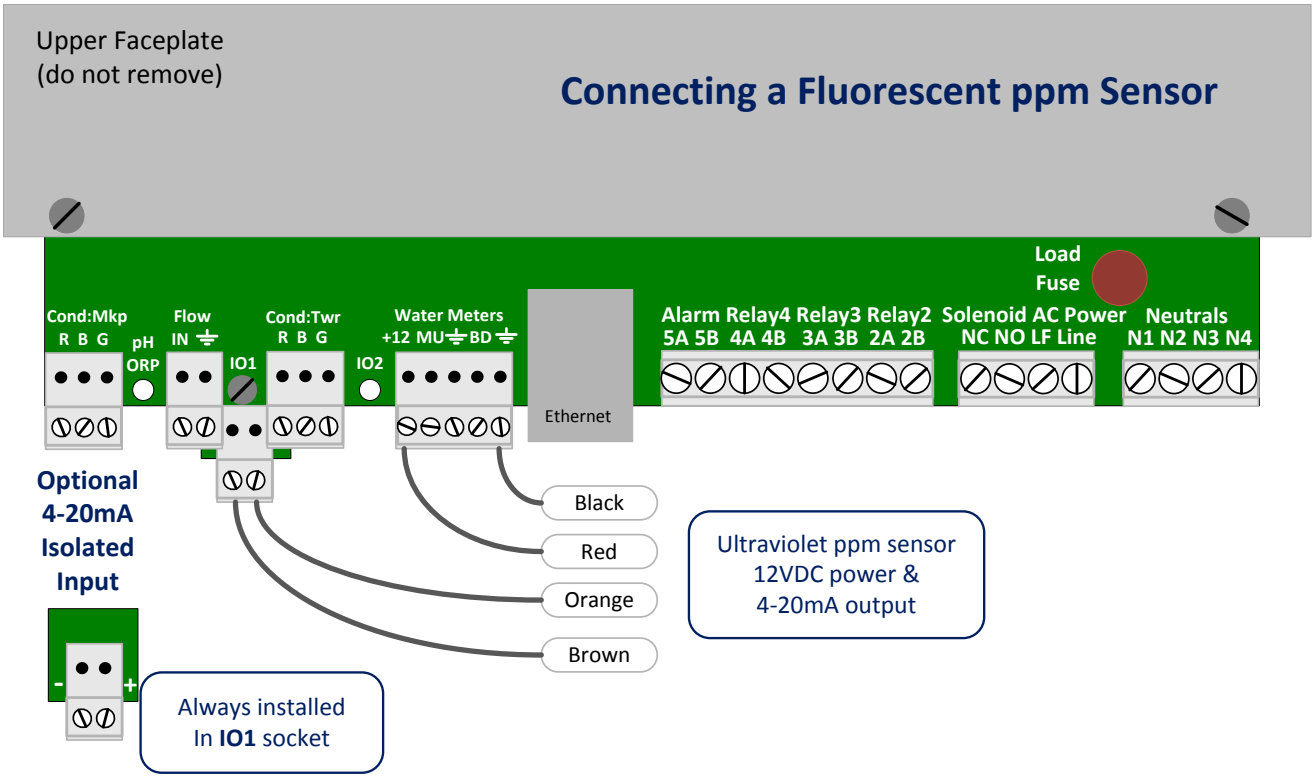
Open the enclosure door, unplug the power cord & remove the lower faceplate:



11. Sensor & Water Meter Wiring

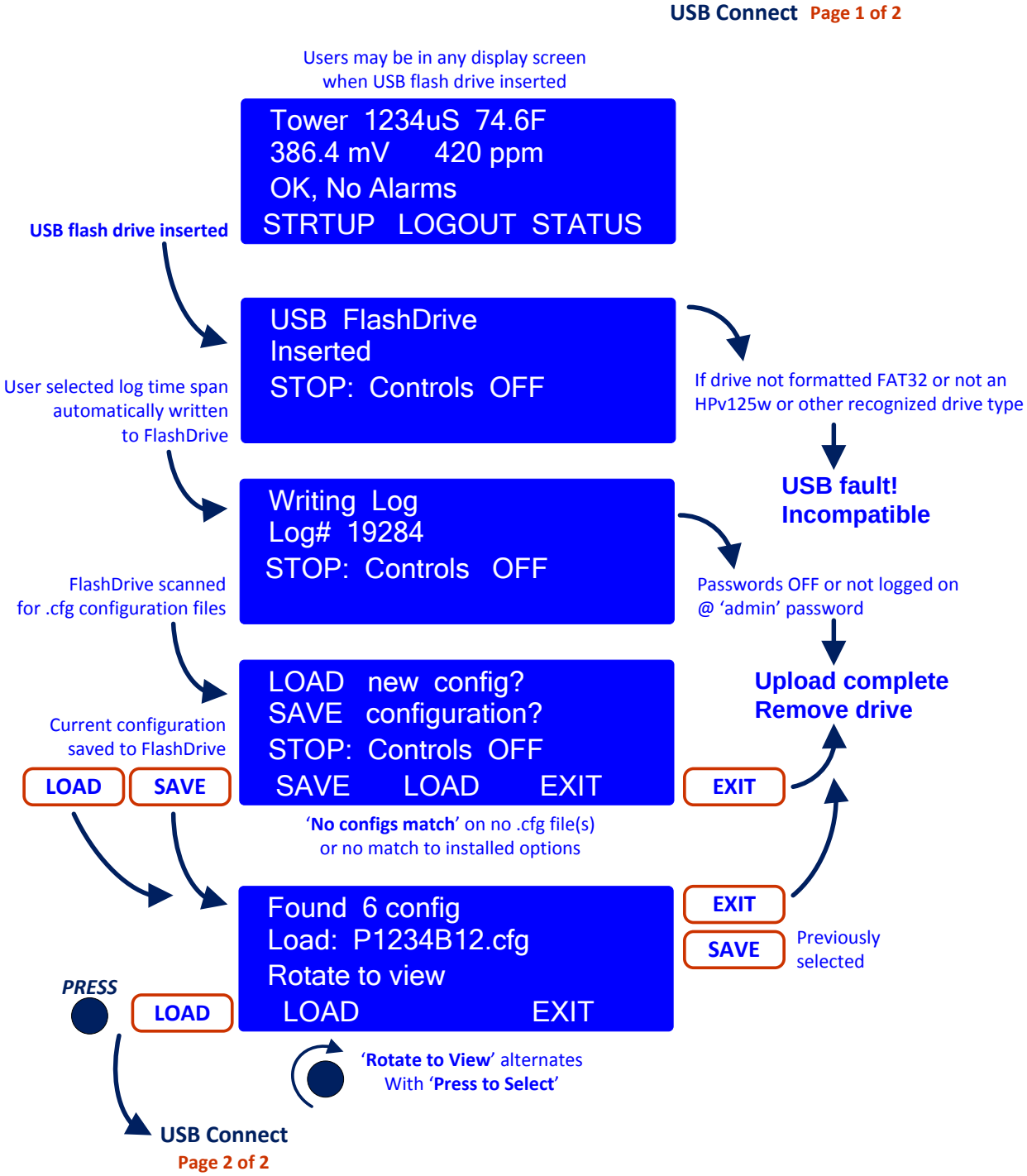
Open the enclosure door, unplug the power cord & remove the lower faceplate:





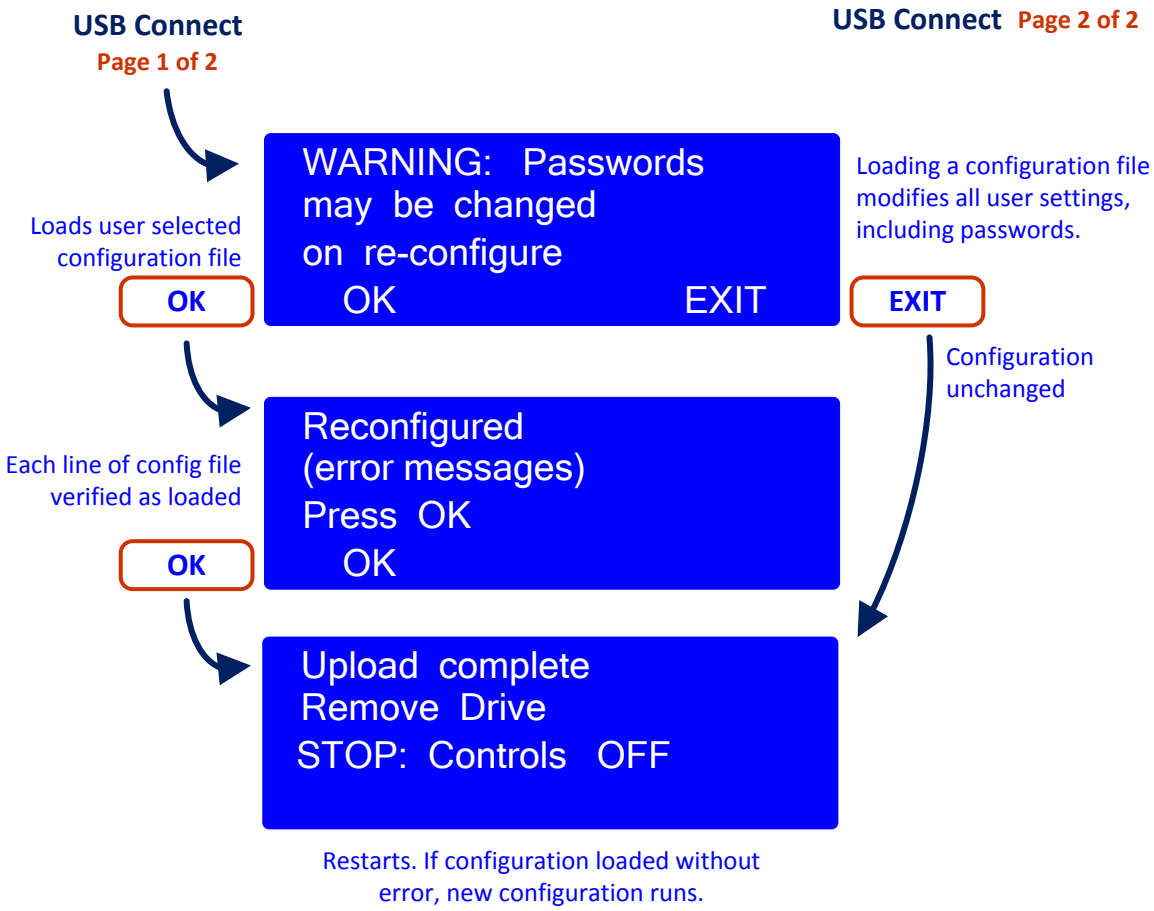
12. USB Flash Drive Data Logs & Configuration Files

WARNING: Relays 1 to 5 turn OFF when the flash drive is inserted
Plug an HP v125w type flash drive or any compatible FAT32 formatted drive into the USB socket.
The time span of the log file is user selected @ **System Settings / Site Options**
(see **1.2 User Menus**).



Notes.

1. Log files are named P**XXX***L**DDD***.txt where **XXX** = last 3 numbers of serial# & ***DDD*** = year Day#
2. Configuration files are named P**XXXX*MDD***.cfg where **XXXX** = last 4 numbers of serial# & ***MDD*** = Month 1..C & day 1..31.
   If you **SAVE** more than one configuration file in any 1 day, the first is named as noted previously & the most recent is named P**XXXXNEW**.cfg.



Notes.

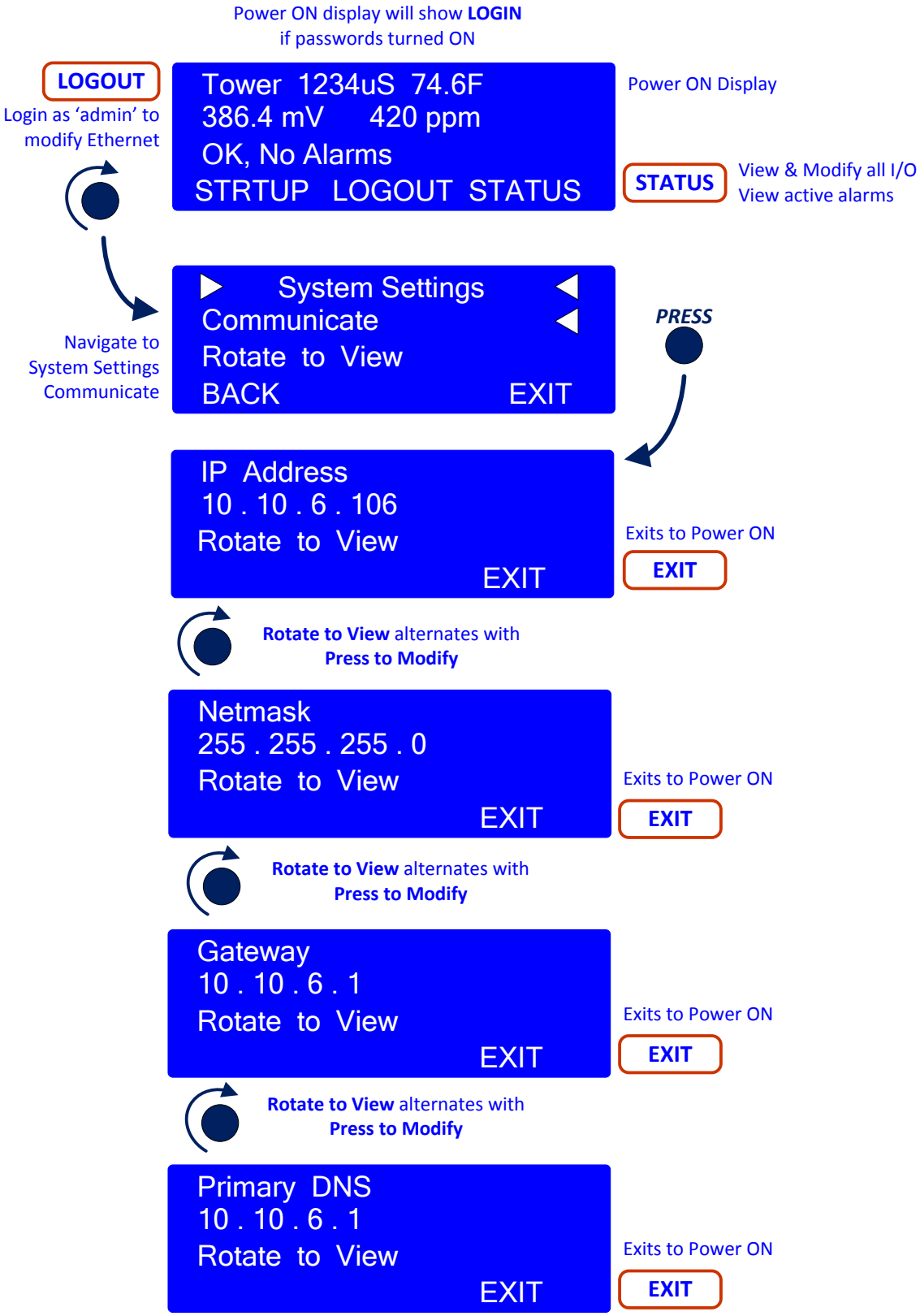
1. Today's configuration file has been written on the flash drive with today's log file.
   You can always return to this initial configuration & it's passwords.
   Today's files are named P**XXXX*MDD***.cfg where **XXXX** = last 4 numbers of serial#
   & ***MDD*** = Month 1..C & day 1..31.
   For example, if the controller's serial number is PA12x1424 & today was June 12
   the configuration file name would be **P1424612.cfg**

2. When you re-insert the flash drive to **LOAD P1424612.cfg.** the controller will
   auto-save the current configuration.
   To prevent overwriting **P1424612.cfg**, if more than one configuration file is **SAVE**ed in any 1 day,
   the first is named as noted previously & the most recent is named P**XXXXNEW**.cfg.

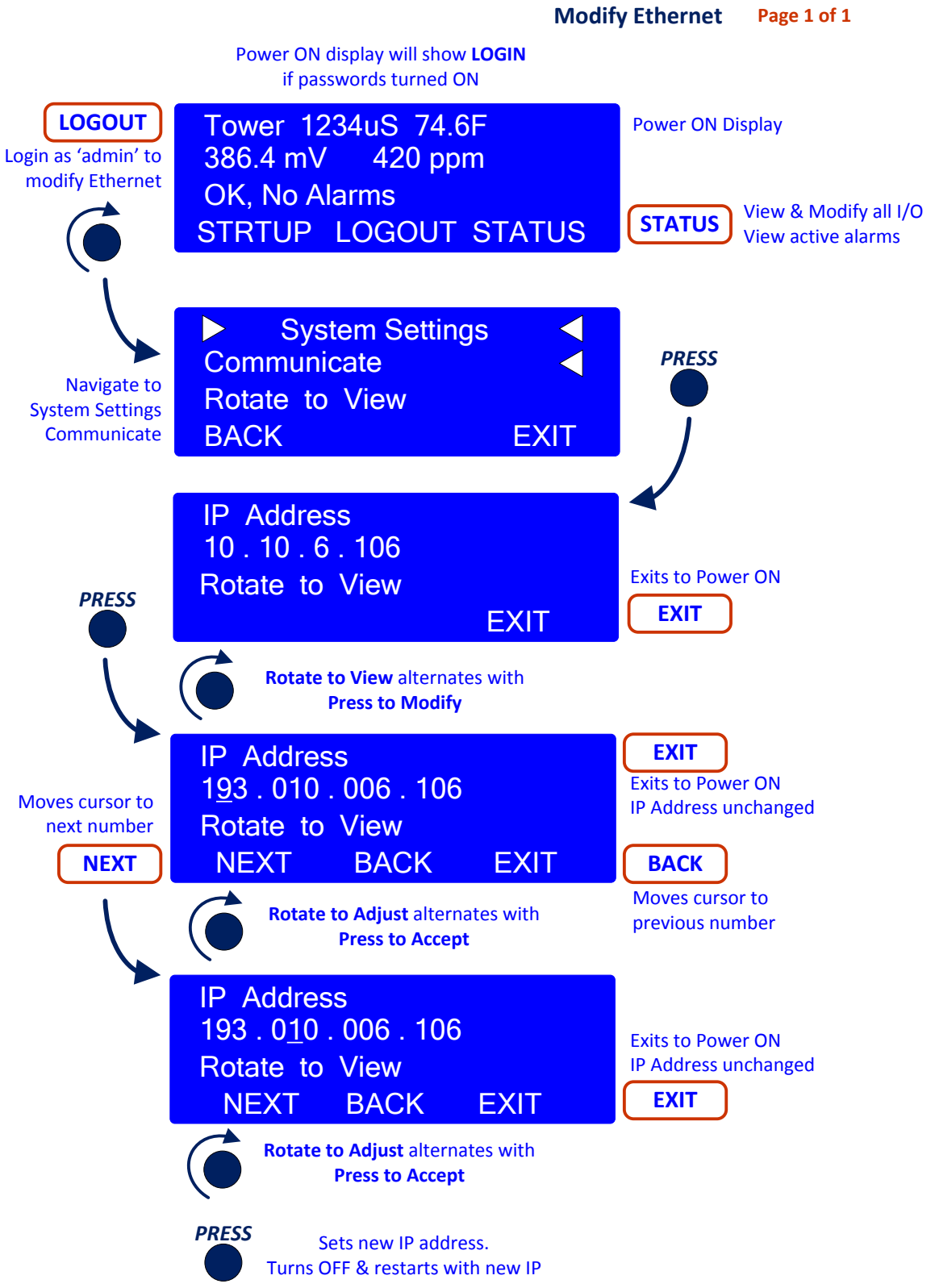
3. If you are creating & saving multiple configurations on the same day, rename or put each configuration
   in a sub-directory on the flash drive after you **SAVE** & it will not be renamed.
   Subdirectory .cfg files will not appear on the list of available configurations.
   You're going the have to rename to avoid more than 1 file with the same name. Any .cfg type
   file name of up to 8 letters maximum will be recognized by the ProMtrac.

13. Ethernet View-Modify

View Ethernet



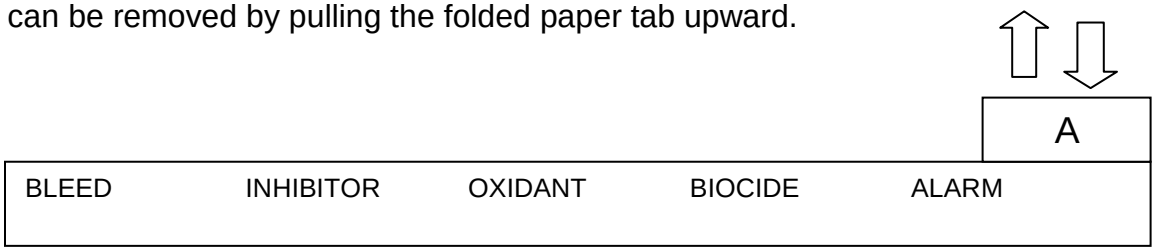
13. Ethernet View-Modify



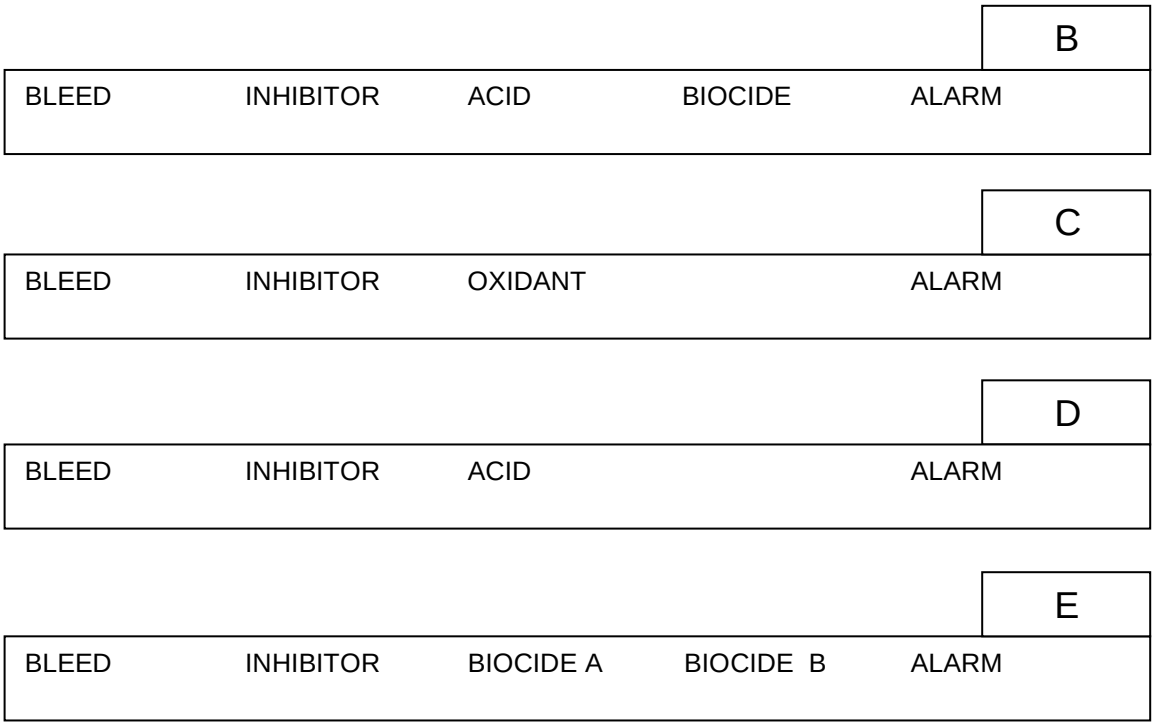
14. Relay Assignment

All units are shipped with the relays configured so that the front top controller panel displays the assigned relay captions in the windows associated with these functions, and indicate the status of each relay by the color of the LED immediately below each individual window (see page 4). Relays are numbered 1 - 5 from left to right.

It is possible to change the relay configuration if required by the application. The LED window captions can be changed by first turning power off to the controller and then removing the top panel. Inserted into the top edge of this panel is the paper legend 'A' or 'B' shown below which can be removed by pulling the folded paper tab upward.



In addition to the original factory configuration, additional paper legends are included with the controller for possible field changes – they are marked on the tab as shown below: 'B' for pH with biocide, 'C' for ORP and no biocide, 'D' for pH and no biocide, and 'E' for two biocides.



SPARE PARTS

7500979	**COND/TEMP/FLOW ASSEMBLY (Probe only 7761529)**
7500980	**COND/TEMP/FLOW ASSEMBLY HIGH PRESSURE (Probe only 7761533)**
7500850	**FUSE**
7500790	**4-20mA OUTPUT DRIVER CARD**
7500791	**pH or ORP DRIVER CARD**
7501032	**4-20mA ISOLATED INPUT DRIVER CARD**
7501031	**MAIN ELECTRONIC CIRCUIT BOARD**
7500727	**LITTLE DIPPER FLUOROMETER**
7500725	**100 PPB CALIB FLUOROMETER CALIUBRATION STANDARD**