AutoRAE 2 ™

Automatic Test and Calibration System

CONTENTS

1 INTRODUCTION

Product registration

Register your product online by visiting:

https://sps.honeywell.com/us/en/support/safety/hgas-product-registration

By registering your product, you can:

- Receive notification of product upgrades or enhancements
- Be alerted to Training classes in your area
- Take advantage of Honeywell special offers and promotions

Standard package contents

TheAutoRAE 2 Controller (P/N T02-0107-000) is shipped with the following:

- AutoRAE 2 Controller
- AutoRAE 2 Terminal Adapter
- PC Communications Cable, USB Type A (Male) to Type B (Male), P/N 410-0086-000
- 12-volt, 7.5A power supply (P/N 500-0141-000) with:
  - US (P/N 410-0036-000),
  - UK (P/N 410-0036-004), and
  - European (P/N 410-0036-005) power cords
- External inlet filters: 1 installed, three spare (P/N 008-3022-003, pack of 3)
- Tygon tubing (1/8" I.D., 15mm long), pack of 5, P/N 411-0018-037-05
- SD memory card - 2GB, P/N 550-0300-000
- Quick Start Guide, P/N T02-4002-000
- Product registration card
- Quality inspection and test certificate

Read before operating

This manual must be carefully read by all individuals who have or will have the responsib using, maintaining, or servicing this product. The product will perform as designed o used, maintained, and serviced in accordance with the manufacturer's instructions.

Sensor specifications, cross-sensitivities, and calibration information

The AutoRAE 2 can be used to calibrate a wide variety of sensors. For calibration inform and specifications and cross-sensitivities of various sensors refer to Honeywell Tech TN-114: Sensor Specifications And Cross-Sensitivities (available for free download f www.sps.honeywell.com). All specifications presented in this Technical Note reflect t performance of standalone sensors. Actual sensor characteristics may differ when th installed in different instruments. As sensor performance may change over time, spe provided are for brand-new sensors.

Make sure firmware is up to date

For best operation, make sure your monitors,AutoRAE 2 Controller and AutoRAE 2 Crad running the latest firmware.

1. Controller firmware.

2. Cradle firmware.

3. Instrument firmware.

Proper product disposal at end of life

The Waste Electrical and Electronic Equipment (WEEE) directive (2002/96/E intended to promote recycling of electrical and electronic equipment and components at end of life. This symbol (crossed-out wheeled bin) indicates s collection of waste electrical and electronic equipment in the EU countries. T product may contain one or more Nickel-metal hydride (NiMH), Lithium-i Alkaline batteries. Specific battery information is given in this user guide. Bat must be recycled or disposed of properly.

At the end of its life, this product must undergo separate collection and recycling fro or household waste. Please use the return and collection system available in your countr the disposal of this product.

2 GENERAL INFORMATION

Automatic test and calibration system

The AutoRAE 2 Automatic Test and Calibration System for new Honeywell portable gas monitors makes compliance with monitor test and calibration requirements as easy a a button. Simply cradle the monitor and the system will take care of all calibration, testing recharging.

The AutoRAE 2 is a flexible, modular system that can be configured to meet your calibrat requirements effectively and efficiently. An AutoRAE 2 system can be as simple as a sing cradle deployed in standalone mode to calibrate one instrument at a time, or as powerful networked, controller-based system supporting ten monitors and five distinct calibrat cylinders.

Key features

ˈ Automatic testing, calibration, charging, and reports management

ˈ Deployable as a standalone cradle or a controller-based system with up to 10 cradles

ˈ Controller with a large, color LCD display

ˈ Up to 5 calibration gas cylinders can be connected at the same time*

ˈ Data storage on a standard SD card

ˈ Bench-top or wall-mounted use

ˈ Instruments supported: MultiRAE Lite (Pumped), MultiRAE, and MultiRAE Pro, M ToxiRAE Pro, ToxiRAE Pro PID, ToxiRAE Pro LEL, and ToxiRAE Pro CO $_2$, QF and diffusion models), and MiniRAE Lite, MiniRAE 3000, ppbRAE 3000, and Ultr

ˈ Unique cradle for all ToxiRAE Pro family (cradle supplied with adapters)

ˈ Networking capability (optional)

ˈ Wireless networking capability using external Wi-Fi module for AutoRAE 2 (option

* Supported only on AutoRAE 2 Controller-based systems.

Benefits

ˡ Easy, one-touch bump testing, calibration, charging, and reports management

ˡ Supports a wide variety of gases, including exotics

ˡ Optimized for field use—does not require a computer to operate

ˡ Firmware-upgradeable to protect your investment

Differences between AutoRAE 2 and stand-alone crad

Summary of differences between an AutoRAE 2 controller-based system and a stan
cradle.

	Controller-based system	Stand
Monitors calibrated simultaneously	Up to 10	1
Number of gas inlets (distinct calibration gas cylinders)	5 dedicated gas inlets plus fresh air with dedicated exhaust port on the Controller	2 dedicated gas i with dedicated e
Display	5.7" TFT (320 x 240) graphical backlit color LCD on the Controller + 2 seven-segment LED displays on each Cradle	2 seven-segmer
Buttons	3 buttons ([Mode], [Y/+], and [N/-]) on the Controller + 2 buttons ([Bump] and [Cal]) on each Cradle	2 buttons ([Bum
Power supply	• 12V, 7.5A output • Charges up to 10 instruments at a time	• 12V, 1.25A out • Charges one ins
Printer support		Through Safety Configurator (SS
Built-in pump	Built-in pump (500 ml/min) in the Controller	MultiRAE Cradle pump to pull in ai ToxiRAE Pro Cr internal pump AutoRAE Cradle relies on the instr in air. MicroRAE AutoF about 300 cc/m
Data storage	Standard 2 GB SD card with security lock on the Controller	None. Data store
Networking	RJ-45 10/100 Base-T port on the Controller Wireless	None

3 SPECIFICATIONS

Size

AutoRAE 2 Controller	5.63" W x 10.43" L x 1.73" H (143 x 265 x 44 mm
MultiRAE Cradle	6.50" W x 12.68" L x 4.37" H (165 x 322 x 111
ToxiRAE Pro Cradle	6.50" W x 11.61" L x 3.91" H (165 x 295 x 99 mm
QRAE 3 Cradle	6.50" W x 12.60" L x 4.65" H (165 x 320 x 118
Handheld PID Cradle	6.50" W x 16.80" L x 4.43" H (165 x 427 x 112
Handheld PID Cradle extended for UltraRAE 3000	6.50" W x 20.31" L x 4.43" H (165 x 516 x 112
MicroRAE Cradle	6.5" W x 11" L x 3.93" H (165 x 180 x 100 mm)
Terminal Adapter	2.17" W x 8.86" L x 1.65" H (55 x 225 x 42 mm)

Weight

AutoRAE 2 Controller	1.9 lbs. (0.86 kg)
MultiRAE Cradle	1.9 lbs. (0.86 kg)
ToxiRAE Pro Cradle	1.96 lbs. (0.89 kg)
QRAE 3 Cradle	2.16 lbs. (0.98 kg)
Handheld PID Cradle	2.79 lbs. (1.27 kg)
MicroRAE Cradle	1.9 lbs. (0.86 kg)
Terminal Adapter	0.33 lbs. (0.15 kg)

Power supply

AutoRAE 2 Controller:	AC adapter (110V to 240V input, 12V, 7.5A output)
	Charges up to 10 instruments at a time
Cradle:	AC adapter (110V to 240V input, 12V, 1.25A output)
	Charges one instrument at a time

Cradles Supported

AutoRAE 2 Controller	Up to 10 cradles total (any mix)

Display

AutoRAE 2 Controller	5.7" TFT (320 x 240) graphical backlit color LCD
Cradle	2 seven-segment LEDs

Buttons

AutoRAE 2 Controller	3 buttons ([Mode], [Y/+], and [N/-])
Cradle	2 buttons ([Bump] and [Cal])

Real-time Clock

AutoRAE 2 Controller	
Cradle	

Visible Alarm/ Indicators

AutoRAE 2 Controller	Color graphical LCD display
Cradle	Tri-color (red/green/yellow) LED lights

Audible Alarm

AutoRAE 2 Controller	90dB @ 12" (30 cm)
Cradle	Same as above

Gas Inlet/Outlet Ports

AutoRAE 2 Controller	6 inlets (1 dedicated fresh air inlet and 5 configurable calibration gas inlets); 1 exhaust port
Cradle	3 inlets (1 dedicated fresh air inlet and 2 configurable calibration gas inlets); 1 exhaust port

Gas Port Connectors

AutoRAE 2 Controller	Connectors with 200-series barbs, 1/8" (3.18 mm) ID tubing
Cradle	Same as above

Gas Regulator

AutoRAE 2 Controller	Demand-flow regulator (0 to 1,000 psig/70 bar)
Cradle	Same as above

Pump Flow Rate

AutoRAE 2 Controller	Built-in pump (500 ml/min)
MultiRAE Cradle	None; relies on instrument's pump to pull in air
ToxiRAE Pro Cradle	400cc/min pump (typical)
QRAE 3 Cradle	400cc/min pump (typical)
Handheld PID Cradle	None; relies on instrument's pump to pull in air
MicroRAE AutoRAE 2	400cc/min pump (typical)

Data Storage

AutoRAE 2 Controller	Standard 2 GB SD card with security lock
Cradle	None. Data stored only on PC

PC Communications

AutoRAE 2 Controller	USB (Type B) port for direct connection to PC
Cradle	Same as above

PC Communications

AutoRAE 2 Controller	USB (Type B) port for direct connection to PC
Cradle	Same as above

Certifications

UKCA

CHAPTER

4   OVERVIEW

An AutoRAE 2 Cradle can be deployed as a stand-alone station for automatic charging, k
testing, and calibrating monitors, or as part of an AutoRAE 2 Controller-based system
can accommodate up to 10 AutoRAE 2 Cradles. These can be all the same or a mix of M
MicroRAE, QRAE 3, and ToxiRAE Pro models, as well as MiniRAE Lite, MiniRAE 3000, p
3000, and UltraRAE 3000.

When an AutoRAE 2 Cradle is connected to the AutoRAE 2 Controller, all electrical, elect
and gas connections are automatically internally connected. A controller-based syste
accommodate up to five distinct gas sources for multi-sensor calibration and bump t

An AutoRAE 2 Cradle can be used on a tabletop (or other flat surface) or mounted on a v
Wall-mounting instructions are included in this guide.

AutoRAE 2 Overview

The AutoRAE 2 Controller turns the AutoRAE 2 into a powerful, networked docking statio
can support up to 10 monitors at a time and accommodate up to five distinct gas sources
multi-sensor calibration and bump testing.

No.	Item	No.	Item
1	Inlet filter	8	On/Off switch
2	Fresh air inlet	9	Y/+ key
3	Exhaust port	10	MODE key
4	5 gas inlets	11	N/- key
5	USB to PC (not shown)	12	Alarm buzzer
6	Ethernet port (not shown)	13	Color LCD
7	DC input from AC adapter (not shown)	14	Up to 10 monitor cradles and the terminal adapte

No.	Item	No.	Item
1	Exhaust port	4	RJ-45 ethernet port
2	Gas ports	5	12V, 7.5A DC power input
3	USB to PC	6	On/Off switch

The AutoRAE 2 Controller has sliding covers to protect its USB and Ethernet ports from contamination when they are not in use. Simply slide their respective covers over them.

Cradles

MultiRAE Cradle

No.	Item	No.	Item
1	Filter	11	Cal key
2	Air inlet	12	Cal/Status LED
3	Exhaust port (not shown)	13	Charging status LED
4	2 gas inlets (not shown)	14	Charge contacts
5	End cap, left	15	Sensors for testing MultiRAE LED alarms
6	USB port (not shown)	16	Sensor for testing MultiRAE buzzer
7	DC input from AC adapter	17	End cap, right
8	2-character LED display	18	Sensors for testing MultiRAE LED alarms
9	Bump/StatusLED	19	Release mechanism
10	Bump key	20	Capture mechanism

ToxiRAE Pro Cradle

No.	Item	No.	Item
1	Filter (hidden)	10	Cal key
2	Air inlet (hidden)	11	Cal/status LED
3	Exhaust port (not shown)	12	Charging status LED
4	2 gas inlets (not shown)	13	Charge contacts (hidden)
5	USB port (not shown)	14	Sensor for testing ToxiRAE Pro buzzer
6	DC input from AC adapter	15	End cap, right
7	2-character LED display	16	Sensors for testing ToxiRAE LED alarms
8	Bump/status LED	17	Release mechanism
9	Bump key	18	Capture mechanism

QRAE 3 Cradle

No.	Item	No.	Item
1	Filter	10	Bump key
2	Air inlet	11	Cal key
3	Exhaust port	12	Cal/status LED
4	2 gas inlets	13	Charging status LED
5	Sensor for testing QRAE3 LED alarms	14	Charge contacts
6	USB port (not shown)	15	Sensor for testing QRAE3 b
7	DC input from AC adapter	16	Sensors for testing QRAE 3
8	2-character LED display	17	Release mechanism
9	Bump/status LED	18	Capture mechanism

MicroRAE Cradle

No.	Item	No.	Item
1	Filter (hidden)	11	Cal/status LED
2	Air inlet (hidden)	12	Charging status LED
3	Exhaust port (not shown)	13	Charge contacts (hidden)
4	2 gas inlets (not shown)	14	Sensors for testing LED alarms
5	USB port (not shown)	15	Sensor for testing buzzer
6	DC input from AC adapter	16	End cap, right
7	2-character LED display	17	Sensors for testing LED alarms
8	Bump/status LED	18	Release mechanism
9	Bump key	19	Capture mechanism
10	Cal key		

Handheld PID cradle

No.	Item	No.	Item
1	Filter	10	Cal key
2	Air inlet	11	Cal/status LED
3	2 gas inlets	12	Charging status LED
4	Exhaust port	13	Charge contacts
5	USB port (not shown)	14	Sensor for testing buzzer
6	DC input from AC adapter	15	Sensors for testing LED alarms
7	2-character LED display	16	Release mechanism
8	Bump/status LED	17	Capture mechanism
9	Bump key		

The UltraRAE 3000 has a gas separation tube holder that extends the length of the instr...
In order to accommodate the extra length, the Handheld PID Cradle is designed so that i...
extends.

1. Turn the Handheld PID Cradle over.

2. Remove the screw with the red washer.

3. Pull out the capture mechanism until it is fully extended.

4. Replace the screw.

End cap with ports

No.	Item	No.	Item
1	Exhaust port	3	USB port
2	Gas ports	4	12V DC power input

The USB port has a sliding cover that protects the contacts from contamination when it is
in use. Simply slide the cover over the port.

Standard package contents

The AutoRAE 2 Cradle for MultiRAE Pumped Monitors (P/N T02-0103-000), QRAE
Monitors (P/N T02-0203-000), AutoRAE 2 Handheld PID Cradle (T02-0403-000), Au
Cradle for MicroRAE (P/N T02-0503-000), and AutoRAE 2 Cradle for ToxiRAE Pro Monit
(P/N T02-0003-000) are shipped with the following:

- AutoRAE 2 Cradle for MultiRAE Pumped Monitors, AutoRAE 2 Cradle for QRAE 3 Pu
  Monitors, AutoRAE 2 Cradle for Handheld PID (MiniRAE Lite, MiniRAE 3000, ppbRAE
  and UltraRAE 3000), AutoRAE 2 Cradle for MicroRAE, or AutoRAE 2 Cradle for ToxiR
  Monitors

- Left and right end caps (for deployment in stand-alone mode)

- For ToxiRAE Pro Cradle only: Cradle comes with ToxiRAE Pro Cradle adapters and s
  for different ToxiRAE Pro models

- Handheld PID Cradle only comes with 1 Quick Connector (P/N: T02-3301-000).

- 4 screws and 4 screw covers to attach the right end cap to the Cradle if deployed in s
  alone mode or Cradle to a controller-based system

- 12-volt, 1.25A power supply with interchangeable plugs, P/N 500-0114-000

- External inlet filters (except Handheld PID): 1 installed, three spare (P/N 008-302
  pack of 3)

- Active Carbon Filter (Handheld PID only), P/N: 490-0006-000

- AutoRAE 2 Handheld PID Cradle comes with 1 Quick Connector (P/N: T02-3301

- Tygon tubing (1/8" I.D., 15mm long), pack of 5, P/N 411-0018-037-05

- PC Communications Cable, USB Type A (Male) to Type B (Male), P/N 410-0086-000

- Quick Start Guide, P/N T02-4014-000

- Product registration card

- Quality inspection and test certificate

5 STAND-ALONE USE

Installing the end caps for stand-alone use. The AutoRAE 2 cradle is shipped with left an
end caps, which are intended to protect and label the ports on both sides of the AutoRAE
Cradle. The one for the "input" side (left end cap) snaps on, while the one on the other si
(right end cap) gets slipped into its position and is then secured with two screws (plastic
are included, to hide the screws).

Note: The same end caps fit all cradle models.

Slide the cap over the end and snap it into place.   Slide the second cap i

Insert the two screws.

Tighten the screws. Do not overtighten!

Press the caps o

6   POWERING THE AUTORAE 2 CR

When used as a stand-alone unit, theAutoRAE 2 Cradle is powered by its own AC adapt
(When an AutoRAE 2 Cradle is attached to an AutoRAE 2 Controller, it receives its powe
the AutoRAE 2 Controller, and therefore does not need a separate AC adapter.) The jack
AC adapter connection is in the recess of the left end cap. Plug the barrel end of the AC
into the AutoRAE 2 Cradle and the transformer into an AC outlet.

Caution: Never use the AutoRAE 2 Cradle or its AC adapter in wet or damp environments
hazardous locations.

Plug barrel from AC adapte

7 PREPARING CRADLE

Preparing cradle for bump testing & calibration

Before performing a bump test or calibration, the AutoRAE 2 Cradle must be set up, filter installed, and power applied. In addition, it must be configured using Safety Suite De Configurator (SSDC) software to set the gas types and concentrations, as well as the tim date. See "Programming a cradle" on page 52 for more information..

Installing an external filter

In order to ensure that fresh air is uncontaminated by dust or other materials, use a filter AutoRAE 2 Cradle's fresh air inlet. The inlet is located on the top end, to the left of the lo mechanism. Inspect the filter periodically and replace it as necessary if dirty, damage contaminated.

Press filter onto receptacle

NOTE: Remove charcoal filter between uses and store in plastic bag for best practice.

Installing an external charcoal filter

When zeroing the ppbRAE 3000, it is necessary to use an external charcoal filter for the
zero readings (alternatively, you can use ultra-pure zero air). It is also a good idea to use
charcoal filter anywhere that the ambient air has VOC (volatile organic compounds).
Carbon Filter (P/N: 490-0006-000) filters out VOC from the air. To install the charcoa
the cradle, remove the plastic filter adapter by twisting the plastic filter clockwise wh
pulling outward. The Active Carbon Filter is designed for 20 uses. To help you keep track
many calibrations are performed, there are 20 small boxes painted on the surface of the
that you can mark with a pen after each use.

Simply press it into the receptacle on the AutoRAE 2 cradle.

Note: Make sure the arrow on the side of the filter points toward the cradle.

Connecting an AC adapter

The AutoRAE 2 Cradle uses a 12V, 1.25A DC adapter. Plug the barrel end into the port o
side of the AutoRAE 2 Cradle and the transformer end into an AC power source. There is
power switch, so when power is applied to the AC adapter, the AutoRAE 2 Cradle is pow

CAUTION

**Never use the AutoRAE 2 Cradle or its AC adapter in wet or damp environments or
hazardous locations.**

Connecting calibration gas to a Cradle

The AutoRAE 2 Cradle can accommodate two gas calibration gas cylinders (mixture or s
gas in each). In addition, there is a connection labeled "Exhaust," for venting the gas afte
gone through the AutoRAE 2 Cradle. All gas connections are barbed to secure the hoses
them. Appropriately non-reactive/non-adsorptive tubing with a 1/8" I.D. should be us
for PID or corrosive or reactive gases, Tygon for others). The cylinders must have deman
regulators (0 to 1,000 psig/70 bar) installed.

No.	Item
1	Exhaust
2	Calibration gas cylinder 1
3	Calibration gas cylinder 2

IMPORTANT!

Always check that the active gas configuration on the AutoRAE 2 Cradle and the
type/concentration of the actual calibration gases connected to the Cradle match be
begin any bump test or calibration.

Cross-sensitivities determination

Cross-sensitivities determine the order in which sensors should be calibrated.

Gases used for calibration should be configured and connected to inlet 1 and then inlet 2 the order in which the sensors should be calibrated. This applies to both a standalone cra and controller-based systems. Information on the order of calibration is available in Technical Note TN-114 and TN-203.

If MultiRAE sensors have cross-sensitivities to the target gas(es) of other sensors in the same instrument, the order in which such sensors are calibrated is important, as time required between calibrations to allow the sensors to clear after exposure to cross-s gas. To shorten the time required to perform calibration, calibrate the most cross-se sensor first, followed by the least cross-sensitive. Wait for both sensors to recover to zer then expose both to gas again with most cross sensitive first and least cross sensitive se

For example, 50 ppm of NH_3 produces 0 ppm response on a Cl_2 (less cross-s and 1 ppm of Cl_2 produces about -0.5 ppm of response on a NH_3 (more cross sensor. So calibrate the NH_3 sensor first with 50 ppm of NH_3. This should have Cl_2 sensor. Then calibrate the Cl_2 sensor with 10 ppm Cl_2. This will send the NH negative for some period.

After calibrating the Cl_2 sensor, return the instrument to clean air and wait until the cross-sensitive sensor (NH_3) fully recovers and/or stabilizes (if it stabilizes to a numb than zero, then re-zero the instrument).

After both sensors return to zero, expose both to calibration gas in the same order (NH and then Cl_2.) Note the sensor response. If both sensors are within 10% of the value s the gas cylinder, then the calibration of the cross-sensitive sensors was successful.

This same logic applies to the order of performing a bump test on an instrument that has cross-sensitive sensors. For more information on cross-sensitivities for select senso Honeywell Technical Note TN-114.

Placing a MultiRAE monitor in the cradle

1. Make sure the external filter on the instrument is not dirty or clogged and screwed on instrument inlet tightly.

2. Make sure the monitor is either turned off or is in AutoRAE 2 Communications Mode.

3. Place the instrument into the cradle face-down, making sure that it is aligned cor with the contacts on the AutoRAE 2 Cradle's charging port. There are two alignmen on one side and one alignment point on the other side, designed to mate with match points on the bottom of the MultiRAE.

4. Press in on the capture mechanism to lock the MultiRAE in place.

Note: there is no need to remove the external filter, rubber boot, belt clip or wrist stra the monitor to use it with the AutoRAE 2.

Placing a ToxiRAE Pro monitor in the cradle

The ToxiRAE Pro cradle requires one of two different adapters, and each is specific to th
of ToxiRAE Pro. They click into place and can be easily removed, in case you want to us
cradle for bump testing/calibrating/managing different types of ToxiRAE Pro monitors

Installing adapters in the ToxiRAE Pro cradle

The two types of ToxiRAE Pro adapters are shown here:

Adapter for ToxiRAE Pro EC, ToxiRAE Pro CO $_2$ and ToxiRAE Pro LEL Adapter for Tox

Align the two holes in the appropriate adapter with the two matching ports inside the
Mechanism.

Adapter for ToxiRAE Pro EC, ToxiRAE Pro CO $_2$ and ToxiRAE Pro LEL Adapter for Tox

Note: The adapters can be removed by pulling on the "thumb tab" at the top of each one
into a niche in the capture mechanism).

Each adapter comes with a sticker for the inside of the cradle. It is especially recommend
that you install these stickers, particularly if both types of adapters are being used in
cradles connected to an AutoRAE 2 Controller.

Place self-adhesive sticker here.

Placing a ToxiRAE Pro monitor in the cradle

1. Make sure the correct adapter is located in the cradle's capture mechanism.

2. Make sure the monitor is either turned off or is in AutoRAE 2 Communications Mode.

3. Place the instrument into the cradle face-down, making check that it is aligned c
   with the contacts on the AutoRAE 2 Cradle's charging port.

4. Press in on the capture mechanism to lock the ToxiRAE Pro in place

Note: There is no need to remove the external filter, rubber boot, belt clip or wrist strap fr
monitor to use it with the AutoRAE 2.

Placing a QRAE 3 monitor in the cradle

1. Make sure the external filter on the instrument is not dirty or clogged and screwed on instrument inlet tightly.

2. Make sure the monitor is either turned off or is in AutoRAE 2 Communications Mode.

3. Place the instrument into the cradle face-down, making sure that it is aligned cor with the contacts on the AutoRAE 2 Cradle's charging port. There are two alignmen on one side and one alignment point on the other side, designed to mate with matc points on the bottom of the QRAE 3.

4. Press in on the capture mechanism to lock the QRAE 3 in place.

Note: There is no need to remove the external filter, belt clip or wrist strap from the monit use it with the AutoRAE 2.

Placing a MicroRAE monitor in the cradle

1. Make sure the monitor is either turned off or is in AutoRAE 2 Communications Mode.

2. Place the instrument into the cradle face-down, making sure that it is aligned cor
   with the contacts on the AutoRAE 2 Cradle's charging port. There are two alignmen
   on one side and one alignment point on the other side, designed to mate with match
   points on the bottom of the MicroRAE.

3. Press in on the capture mechanism to lock the MicroRAE in place.

Note: There is no need to remove the belt clip or wrist strap from the monitor to use it wit
AutoRAE 2.

Placing a Handheld PID monitor in the cradle

You must remove the inlet probe before placing a handheld PID instrument (MiniRAE
MiniRAE 3000, ppbRAE 3000, or UltraRAE 3000) into the cradle. If the instrument does r
have a Quick Connector (P/N: T02-3301-000) already installed, you must install one

Installing a quick connector

MiniRAE Lite, MiniRAE 3000, or ppbRAE 3000:   UltraRA

To remove the inlet:

1. Press down on the collar of the Quick Connector base.

2. Lift the inlet probe off of the base.

Installing the instrument in the cradle

If the instrument is equipped with a Quick Connector, install the instrument in the cra

1. Remove the inlet probe by pressing down on both sides of the base and releasing th
   probe.

2. Make sure the monitor is either turned off or is in AutoRAE 2 Communications Mode.

3. Place the instrument into the cradle face-down, making sure that it is aligned cor
   with the contacts on the AutoRAE 2 Cradle's charging port. There are two alignmen
   on one side and one alignment point on the other side, designed to mate with match
   points on the bottom of the instrument.

4. Press in on the capture mechanism to lock the instrument in place.

For MiniRAE Lite, MiniRAE 3000, or ppbRAE 3000:

For UltraRAE 3000:

Warm-up

When you place a monitor in the cradle and lock the capture mechanism, the Cradle automatically starts charging the instrument and initiates a warm-up cycle to prepare instrument for bump testing or calibration. In order for the warm-up cycle to commen however, the monitor needs to be either turned off or in AutoRAE 2 Communications mo

The warm-up time depends on the sensors installed in the instrument and their indiv warm-up requirements. During warm-up, the two Cradle LEDs labeled "Bump" and "Cal" orange in alternation. When the instrument is warmed up, the two LEDs glow contin green, indicating that you may now perform a bump test or calibration.

If the instrument fails to warm up, the Cradle's Bump and Cal LED lights will blink red in alternation and the buzzer will alarm. Remove the monitor from the cradle and refer to th information on the instrument display.

An instrument to be placed in the cradle can be off or turned on and set for AutoRAE 2 Communications mode.

1. When you place an instrument that is turned off into the Cradle, the Cradle auto starts charging the instrument and initiates a warm-up cycle to prepare the instr bump testing or calibration.

   Note: If the instrument's voltage is too low to power on, the cradle initiates a warm-u until the voltage is sufficient to power on. That is to say, the identification time is lon

2. When instruments are turned on and entered into AutoRAE 2 communication mc are treated in different ways. Refer to this following table:

Instrument	Instrument powered off		Instrument po... AutoRAE 2 C...
	Time	Comments	Time
MultiRAE	2'12"	Performs self-test. PID sensor needs 2 minutes to warm up.	6"
ToxiRAE Pro	1'26"	Performs self-test. PID sensor needs 1 minute to warm up.	25"
QRAE 3	1'22"	Performs self-test. Sensors need 1 minute to warm up.	8"
MiniRAE Lite	10"	Performs self-test.	6"
MicroRAE	30"	Performs self-test.	12"
MiniRAE 3000, ppbRAE 3000, UltraRAE 3000	10"/20"	Performs self-test. Normal time is 10". If wireless is supported, it requires 20".	6"

Important! If sensors are still warming when entering AutoRAE 2 Communications M...
instrument will not be ready until the sensors are warmed.

8   PERFORMING A MANUAL BUMP

Honeywell recommends that a bump test be performed on all portable instruments p
each day's use. A bump test is defined as a brief exposure of the monitor to the test gas t
make sure that sensor respond to gas and alarms are functional and enabled.

ι   The monitor must be calibrated if it does not pass a bump test, or at least once every
days, depending on use and sensor exposure to poisons and contaminants.

ι   Calibration intervals and bump test procedures may vary due to national legislatio

1. Connect calibration gas cylinders that match the gas settings configured on the C
specified for Bottles 15 and 16 under Gas Config 8. See "Gas inlet configuration set
on page 54 for more information.).

2. Insert an instrument in the AutoRAE 2 Cradle (as described in Section 6.4) and wait f
warm up (See "Placing a MultiRAE monitor in the cradle" on page 33 for more inform

3. When the instrument is warmed up (both LEDs are glowing green), press "Bump" to i
a bump test. The Cradle produces a beep to signal the start of a bump test.

4. The Bump LED flashes green when a bump test is under way. The Cal LED stays da

5. If the instrument passes a bump test, the Bump LED will turn solid green.

Note: See section 10 for an explanation of the LED indications that tell you which
operations are underway and which LED indications tell you of errors during a bump

Note: In its standard configuration, if the instrument does not successfully pass
test, the AutoRAE 2 Cradle automatically initiates a full calibration.

9 PERFORMING A BUMP TEST

Performing an automatic bump test

If the Cradle is configured to perform an automatic bump test, place the monitor in the cr
and lock it. Bump testing starts automatically. Every other aspect of bump testing is
a manual bump test, including messages that are shown if an instrument is removed, a b
test is aborted, or calibration gas runs out.

Note: To configure a Cradle or Controller/Cradle system for automatic bump testing
using Safety Suite Device Configurator (SSDC). Refer to section 15 for the installation
procedure.

10 PERFORMING A CALIBRATION

All portable instruments must be calibrated periodically in accordance with national a
regional regulations, but no less frequently than every 180 days. Always perform a full
calibration after replacing a sensor, using a new instrument for the first time, or if the
instrument has been unused for a long period of time. In addition, if the instrument has fa
bump test, perform a full calibration as well.

1. Connect calibration gas cylinders that match the gas settings configured on the C

2. Insert an instrument in the AutoRAE 2 Cradle (See "Placing a MultiRAE monitor in the
   cradle" on page 33 for more information.) and wait for it to warm up (See "Warm-up"
   page 40 for more information.).

3. When the instrument is warmed up (both LEDs are glowing green), press "Cal" to init
   calibration. The Cradle produces a beep to signal the start of the calibration process

4. The Cal LED flashes green when a calibration is under way. The Bump LED stays da

5. If a calibration completes successfully, the Cal LED will turn solid green.

Note: See section 10 for an explanation of the LED indications that tell you which
operations are underway and which LED indications tell you of errors during cal

11 BUMP AND CAL ERROR

Bump and cal error and status messages

The LEDs labeled "Bump" and "Cal" above the two keys on the AutoRAE 2 Cradle provid[...]
information about status during bump and calibration testing. The following table exp[...]
various messages:

Status	Bump LED	Cal LED	User Action
Warm-up in progress	Orange blinking in alternation with Cal LED	Orange blinking in alternation with Bump LED	Pressing keys has no effect.
Warm-up error	Red blinking in alternation with Cal LED	Red blinking in alternation with Bump LED	Remove the instrument from the cr[...] the action indicated on the instrume[...]
Warm-up completed successfully	Green (solid)	Green (solid)	Press Bump or Cal key to perform a [...] calibration.
Bump test in progress	Green (blinking)	Off	Do not remove the instrument, or th[...] be interrupted. Pressing keys has n[...]
Bump test completed successfully	Green (solid)	Off	The bump test result (pass) has be[...] may remove the instrument from th[...] use or leave it on the Cradle for the n[...] 2 operation or to charge its battery.
Bump test failed	Red (blinking slowly)	Off	The bump test result (fail) has been [...]
Calibration in progress	Off	Green (blinking)	Do not remove the instrument, or th[...] be interrupted. Pressing keys has n[...]
Calibration completed	Off	Green (solid)	The result (pass) has been logged. [...] remove the instrument from the Cra[...]

Status	Bump LED	Cal LED	User Action
Calibration failed	Off	Red (blinking slowly)	The result has been logged in the i... may remove it from the Cradle and... display for an error code. If a Control... the Controller's display shows the e...
Sleep mode	Orange (solid)	Orange (solid)	Charging continues when in sleep... either key to wake up the instrumer...
Monitor not connected / system idle	Off	Off	Check to make sure the monitor is... installed in the cradle and the captu... mechanism is fully engaged. Check to make sure the monitor is in... Communications Mode or turned...
Cradle error	Red (blinking slowly at the same time as the Cal LED)	Red (blinking slowly at the same time as the Bump LED)	Take the action indicated in the Co... display, if used. Otherwise, contact... Technical Support.

12 CHARGING A BATTERY

Charging an instrument's battery

Placing an instrument in the cradle and locking it in position allows the instrument's battery to
be charged.

When power is applied to the AutoRAE 2 Cradle and the instrument's battery is charging, the
LED glows red.

The LED glows green when the battery is fully charged:

13 REMOVING AN INSTRUMENT

Removing an instrument from a cradle

When you want to remove an instrument from a cradle, press down on the red release le
until the capture mechanism springs forward, releasing the instrument. Then lift the i
from the cradle, inlet side first.

IMPORTANT!

If you remove an instrument that is warming up or under bump test or calibration, the pro
is interrupted, and requires that you place the instrument back in the cradle to restart the

AutoRAE 2 reports

After you perform any test on an instrument, the display on the instrument gives a report
each test that has been done.

Step through the screens to see results from tests that were performed. For example, on
MultiRAE:

Select Exit to return the monitor to Normal Measurement Mode.

14   PROGRAMMING A CRADLE

Programming a stand-alone AutoRAE 2 cradle

The AutoRAE 2 Cradle gas configurations (gas inlet settings) as well as the system date
time comprise the configurable parameters available for an AutoRAE 2 Cradle. You need
Safety Suite Device Configurator (SSDC) Software, the AutoRAE 2 Cradle connected to
source, and a USB PC communications cable.

1. Connect a USB cable between a PC with Safety Suite Device Configurator (SSDC) S
   and the AutoRAE 2 Cradle.

2. Make sure the AutoRAE 2 Cradle is on (AC adapter connected and plugged in).

3. Put the Cradle into PC communications mode. Press and hold the "Bump" key for five
   seconds, until the 2-digit LED display at the bottom left of the Cradle shows "PC."

4. Start Safety Suite Device Configurator (SSDC) software on the PC.

5. Login with your username and password. By default the user name is "administrator"
   the password will be "Default123".

6. The program will begin performing a Startup Scan for any connected devices.

7. Add AutoRAE 2 IP (if connected through network) to Safety Suite Device Configurato
   (SSDC) using the "Search AutoRAE 2 IPs" option.

8. Locate the device on the device list and Click on the device's serial number.

9. Safety Suite Device Configurator (SSDC) will then show the information of the AutoR
Cradle and two windows with both inlet information.

10. Click on the calendar icon next to the date and time to check or set the date and time

If you want to synchronize the date and time on the AutoRAE 2 Cradle with the time on th
click the box labeled "Synchronize with Server."

Gas inlet configuration settings

Gas Inlet windows tells the AutoRAE 2 what kind of gas is supplied to each gas inlet.

The Gas Inlet windows section includes configuration parameter settings for the two
Cradle gas inlets including gas types, concentrations, concentration units, purge tim
soak time for gas cylinders connected to each gas inlet. You can modify these values an
upload them to your AutoRAE 2 Cradle(s) or download the values currently program
the Cradle to Safety Suite Device Configurator (SSDC)

Gas Inlet windows cover settings for two cylinders of gas corresponding to gas inlets 1 a
respectively, on the side of the AutoRAE 2 Cradle.

The window shows the Gas Inlet number, the gasses included, Gas Lot Number, Gas Ex

Selectable gas index values

Click on the Edit icon   to access the selected Inlet Configuration window.

Supported gases include:

1 - CO	9 - HCl	17 - CH_3SH
2 - H_2S	10 - HF	18 - CO_2
3 - SO_2	11 - Cl_2	19 - Isobutylene
4 - NO	12 - ClO_2	20 - Benzene
5 - NO_2	13 - H_2	21 - Propane
6 - HCN	14 - HCHO	22 - Methane
7 - NH_3	15 - $COCl_2$	23 - Nitrogen
8 - PH_3	16 - O_2	24 - ETO

Note: Use the scroll bar to select the desired gas.

Concentration [value]

You can set the concentration value by clicking in the respective gas concentration box a
then typing in the concentration value.

Concentration unit

When you click on the drop-down Concentration Unit menu, select the desired gas concentration units (there are other types of units).

ppm

%

ppb

μ g/m^3

mg/m^3

ug

%LEL

%VOL

%CH4

μ

μ mol/mol

x10^6

Purge time (sec.)

Type to set the number of seconds for the system to purge with fresh air after performing bump test or calibration.

Soak time (sec.)

Type to set the number of seconds for the system to allow the sensor to be pre-exposed calibration gas before bumping or calibrating.

Uploading settings to the AutoRAE 2 cradle

To upload the settings to the AutoRAE 2 Cradle just click on the Save button and wait to program to reload the screen.

Saving the settings file

If you want to save the settings for backup or for use later, click the "Save as File" button then save the file. The file has a ".ssc" extension (a SSDC file).

Recalling stored settings

If you have previously stored settings in a separate file, you can call them up so that you modify them and/or apply them to AutoRAE 2 Cradles. This feature is especially useful if have multiple individual Cradles to which similar settings need to be populated.

1. Click the icon.

2. Select

3. The configuration can also be updated and saved back to the file or can be applied to another device with the same make and model.

4. Apply to Device: To apply the changes or configuration to a device, Select Apply to D from the below screen.

5. Select a Device to apply the configuration from the list of devices.

6. Click on the Tick box.

7. Select Save.

8. The Configuration is applied to the Instrument.

Note: Currently the Configuration can only be applied to device that have the same firmw
version. If the device you want to apply the configuration file is not on the same version,
upgrade / downgrade the firmware to match the version before applying.

Uploading settings to multiple AutoRAE 2 cradles

You can apply settings to multiple cradles. Simply connect one cradle to the PC and upl
settings as outlined in the previous section, disconnect that cradle, connect another,
upload settings.

Exiting programming

When you are done programming and have saved the settings, do the following:

1. Exit Safety Suite Device Configurator (SSDC).

2. Disconnect the USB cable between the PC and the AutoRAE 2 Cradle.

3. Press the "Bump" key on the AutoRAE 2 Cradle (the display changes from "PC" to th
   active gas configuration, G8).

15   UPGRADING CRADLE FIRMWA

Upgrading firmware on the AutoRAE 2 cradle

Upgrades to a stand-alone AutoRAE 2 Cradle's firmware can be loaded into the AutoRAE
Cradle using Safety Suite Device Configurator (SSDC) software running on a PC. If the C
(or multiple Cradles) is attached to an AutoRAE 2 Controller, follow the AutoRAE 2 Contr
Firmware Upgrade. See "Performing firmware upgrades" on page 65 for more inform

1. Connect a PC running Safety Suite Device Configurator (SSDC) software to the Auto
   Cradle via a USB cable.

2. Press and hold the Bump key until "PC" appears in the display.

3. Start Safety Suite Device Configurator (SSDC).

4. Click on the Device serial number to access the details screen. Find the current firmw
   version in the details screen as shown.

5. Click on 'Update' button (it will show under the Firmware Version when available). If t
   is connected to internet and the 'Firmware updates using local file' setting is not che
   clicking the update button would set the firmware to the latest version supported
   device.

6. If PC is not connected to internet or if the 'Firmware updates using local file' setting is
   checked you can apply the firmware manually as below:

   ꞁ Click the 'Update' button.

   ꞁ Click on "Choose file" in the "Update Firmware Version" selection dialog box. Th
      firmware can be downloaded from: https://sps.honeywell.com/us/en/softw

7. The firmware update will start.

8. The firmware is uploaded to the AutoRAE 2 Cradle.

9. Exit PC Communications mode on the AutoRAE 2 Cradle by pressing "Bump." The d
   should now show "G8."

10. Exit Safety Suite Device Configurator (SSDC) on the PC.

11. Disconnect the USB cable.

16 AUTOMATIC BUMP TESTING

Configuring the system for automatic bump testing

If the system or one of its cradles is not configured for automatic bump testing, you must
configure it. This enables automatic bump testing for a stand-alone cradle or any nu
cradles in a system.

1. Connect a PC running Safety Suite Device Configurator (SSDC) to the AutoRAE 2 Cr
   a USB cable.

2. Press and hold the Bump key until "PC" appears in the display.

3. Start Safety Suite Device Configurator (SSDC).

4. Login with your username and password. By default the user name is "administrator"
   the password will be "Default123".

5. Click "LOG IN"

6. Select the AutoRAE 2 Cradle.

8. Click "Save" to save the changes on the configuration.

17 STAND-ALONE AUTORAE 2 SET

Using A Stand-Alone AutoRAE 2 Cradle for Datalog Transfer, Monitor Configuration,
Firmware Upgrades. Datalogs can be downloaded from an instrument to a computer
firmware updates and configuration data can be uploaded to an instrument via the U
a stand-alone AutoRAE 2 Cradle. Use the included USB cable to connect the AutoRAE 2
to a computer running Safety Suite Device Configurator (SSDC). Follow the instructi
Safety Suite Device Configurator (SSDC) User's Guide.

18   PERFORMING FIRMWARE UPG

A compatible AutoRAE 2 monitor's firmware can be upgraded using an AutoRAE 2 Contr
and AutoRAE 2 Cradle for that monitor connected to a PC running Safety Suite Device
Configurator (SSDC) software. The following procedure covers the process of upgra
firmware.

Note: Refer to the Safety Suite Device Configurator (SSDC) User's Guide and the monito
User's Guide for more detail on operation and parameters.

Prepare for data transmission

1. Make sure the PC is running the latest version of Safety Suite Device Configurator (S
   software.

2. Use the included USB cable to connect the AutoRAE 2 Cradle to PC.

3. Make sure the AC adapter is plugged into an AC power source and the AutoRAE 2 C

4. Make sure an SD card is in the port on the side of the AutoRAE 2 Controller. The port
   located at the lower end of the AutoRAE 2 Controller:

Note: Instructions for installing an SD card are included in the AutoRAE 2 User's Gu

5. Toggle the power switch on the side of the AutoRAE 2 Controller to turn it on. The LC
   display turns on and the LED on the on/off switch glows red. The system performs a
   test, covering the AutoRAE 2's internal pump and valves, Terminal Adapter, gas pre
   connected cylinders, and other vital components and parameters. As each crad
   powered up, its Bump and Cal LEDs turn on momentarily and the two-character LE
   display lights up showing the Cradle ID number in the system.

Place a monitor in its cradle

1. Make sure the monitor is either turned off or is in AutoRAE 2 Communications Mode.

2. Place the instrument into the cradle face-down, making sure that it is aligned cor
   with the contacts on the AutoRAE 2 Cradle's charging port. There are two alignmen
   on one side and one alignment point on the other side, designed to mate with match
   points on the bottom of the monitor.

3. Press in on the capture mechanism to lock the monitor in place.

Note: There is no need to remove the belt clip or wrist strap from the monitor to use
the AutoRAE 2.

Upgrade firmware on a monitor with a PC

Upgrades to a monitor's firmware are loaded from a PC using Safety Suite Device Config
(SSDC) software running. The monitor must be in the AutoRAE 2 Cradle for that monitor,
the cradle/controller must be attached to a PC running Safety Suite Device Configur
(SSDC).

1. Make sure the PC running SSDC is connected to the AutoRAE 2 Cradle via a USB c
   that the monitor is secured in the cradle and that the AutoRAE 2 Controller is turne

2. Start Safety Suite Device Configurator (SSDC).

3. Login with your username and password. By default the user name is "administrator"
   the password will be "Default123".

4. Click "LOG IN"

5. Select the Monitor

6. Click on 'Update' button (it will show under the Firmware Version when available). If t
   is connected to internet and the 'Firmware updates using local file' setting is not che
   clicking the update button would set the firmware to the latest version supporte
   device.

7. If PC is not connected to internet or if the 'Firmware updates using local file' setting is
   checked you can apply the firmware manually as below:

   ˌ Click the 'Update' button.

   ˌ Click on "Choose file" in the "Update Firmware Version" selection dialog box. Th
     firmware can be downloaded from: https://sps.honeywell.com/us/en/softw

   ˌ Browse to select the firmware file to apply (.rfp file).

8. The firmware update will start.

9. The firmware is uploaded to the Monitor.

10. Release the monitor from its Cradle by pressing the red tab. Then remove the instrum

11. Exit Safety Suite Device Configurator (SSDC) on the PC.

12. Disconnect the USB cable.

Note: After upgrading the monitor's firmware, the instrument will turn off automaticall

19 OPERATION OF AN AUTORAE 2

Operation of an AutoRAE 2 Controller-based System

Deploying AutoRAE 2 Cradles with the AutoRAE 2 Controller significantly enhances system's capabilities compared to those of a standalone cradle. An AutoRAE 2 Controller system can charge, test, and calibrate up to 10 instruments at the same time using up to distinct gas inputs. The system has a standard SD card on which data are stored.

When one or moreAutoRAE 2 Cradles are attached to the AutoRAE 2 Controller, the Auto controller acts as the "command center" for the system. The Controller powers the entire system, manages all the configuration settings, and its built-in pump and valves con gas flow.

Note: An AutoRAE 2 Terminal Adapter must be attached to the rightmost cradle in order f AutoRAE 2 Controller-based system to work.

IMPORTANT!

Before using the AutoRAE 2 Controller, it must be configured using Safety Suite Device Configurator (SSDC) software to set the gas types and concentrations, as well as the tim date. See "Settings" on page 101 for more information..

20 SETTING UP AN AUTORAE 2

Setting up an AutoRAE 2 controller-based system

A single AutoRAE 2 Controller can connect with up to 10 AutoRAE 2 Cradles (these can
one kind, or mixed types). The Terminal Adapter must be connected to the final (rightmos
AutoRAE 2 Cradle.

To assemble an AutoRAE 2 Controller-Based System, slide an AutoRAE 2 Cradle snugly
the AutoRAE 2 Controller. If you have more than one AutoRAE 2 Cradle, slide each one
the other, until all are held snugly. Then slide the Terminal Adapter against the last one. F
them all into place once more, and then insert the Philips screws that hold the units secu
together.

Tighten all of the Philips screws, and then press the black plastic caps over them.

Installing batteries for the real-time clock

The AutoRAE 2 Controller has an internal real-time clock (RTC), which is set via Safety S
Device Configurator (SSDC). A small button cell is soldered to the main board to keep th
running when power is removed from the system (it is recharged when power is connecte
addition, three AA replaceable batteries in the AutoRAE 2 Controller maintain the last
calibration record in the event that it is not written to the SD card.

1. Make sure the AutoRAE 2 Controller is turned off and the AC adapter disconnected.

2. Remove the two Phillips-head screws that secure the battery compartment cove

3. Remove the battery compartment cover.

4. Insert three AA batteries (alkaline or lithium), paying attention to their polarity.

5. Replace the cover.

Attaching an external filter

In order to ensure that fresh air is uncontaminated by dust or other materials, use a filter
the AutoRAE 2 Controller's fresh air inlet. The inlet is located at the top end on the left si
Inspect the filter periodically and replace it as necessary if it is dirty, damaged, or
contaminated.

AutoRAE 2 Controller – top view

Press filter onto receptacle

NOTE: Remove charcoal filter between uses and store in plastic bag for best practice.

Active carbon filter for removing VOC

Whether zeroing the ppbRAE 3000 or in an environment in which the ambient air has VO
(volatile organic compounds), you can use an Active Carbon Filter (P/N: 490-0006-0
filters out VOC from the air. When an AutoRAE 2 Controller is used with one or more Cra
the air inlet on each attached cradle is disabled and air is taken in through the Controller'
inlet. Therefore, you only need to use one Active Carbon Filter for the Controller instead
each cradle. To install the Active Carbon Filter on the cradle:

1. Remove the standard filter (if one is installed).

2. Remove the plastic filter adapter by twisting the plastic filter clockwise while gen
   outward.

3. Press the Active Carbon Filter into the receptacle. The filter is designed for 20 uses.
   you keep track of how many calibrations are performed, there are 20 small boxes pa
   on the surface of the filter that you can mark with a pen after each use. Note: Make
   the arrow on the side of the filter points toward the cradle.

Remove standard filter

Press Active Carbon
receptacle

Remove plastic filter
adapter

21   POWERING AN AUTORAE 2

Powering an AutoRAE 2 controller-based system

An AutoRAE 2 Controller-based system is powered by its 12V, 7.5A AC adapter. The jack
AC adapter connection is in the recess on the left side of the AutoRAE 2 Controller, next
power on/off switch. Plug the barrel end of the AC adapter into the AutoRAE 2 and the
transformer into an AC outlet.

CAUTION

**Never use the AutoRAE 2 Controller or its AC adapter in wet or damp environments o
hazardous locations.**

Plug barrel from AC adapter

22 OPERATION

Operating a controller and attached cradles

When an AutoRAE 2 Controller is attached to one or more AutoRAE 2 Cradles, the butto
the AutoRAE 2 Cradles are only used to initiate a bump test or calibration. The two-chara
LED displays on each Cradle show the ID number for the respective Cradle. All operation
settings are controlled by the AutoRAE 2 Controller.

Turning the AutoRAE 2 controller on

Toggle the switch on the side of theAutoRAE 2 Controller. The LCD display turns on and
LED on the on/off switch glows red. The system performs a self-test, covering the AutoRA
internal pump and valves, Terminal Adapter, gas pressure in connected cylinders, an
vital components and parameters. As each cradle is powered up, its Bump and Cal LEDs
on momentarily and the two-character LED display lights up showing the Cradle ID n
the system.

Turning the AutoRAE 2 controller off

Toggle the switch on the side of the AutoRAE 2 Controller. The display and power LED g
as do all the LEDs on attached cradles.

Startup routine

When you turn on the system, the AutoRAE 2 Controller's display shows this screen:

It then goes through a series of tests and shows several screens, including configura
information for the five gas inlets.

If the system's initial checkout passes, then this screen is displayed:

If either or both mechanical tests fail, then a red square with an "X" in it indicates the pro

If the Controller Valve & Manifold Check fails, you should turn off the system and contact
Honeywell Technical Support.

If the Terminal Adapter Check fails, make sure the Terminal Adapter is connected to the l
AutoRAE 2 Cradle, and that all the AutoRAE 2 Cradles in the system are firmly connecte
restarting the system. If everything is connected but the test fails again, contact Hor
Technical Support.

If all tests pass, then this screen is displayed, indicating that the AutoRAE 2 system is re
use:

If there are instruments in the cradles, their warm-up process starts automatically as
their respective cradle has been powered up and identified by the AutoRAE 2 Controller.

User interface

All functions and configurations are initiated by using the three buttons on the Contro
[Y/+], [MODE], and [N/-]:

"Soft keys" are shown on the display, and the AutoRAE 2 Controller's buttons correspond
keys directly above them. For example:

Display status messages and color coding

The AutoRAE 2 Controller has a color display, so colors are used to indicate status in dif
categories of information.

Status	Color	Explanation
Pass	**Green**	1. All sensors and alarms passed bump test. 2. All sensors and alarms passed calibration.
Pass?	**Green**	1. All sensors that were tested passed bump test. Some sensor tested. 2. All sensors that were calibrated passed calibration. Some sen not calibrated.
Fail	**Red**	1. One or more sensors or alarms failed bump test. 2. One or more sensors or alarms failed calibration. 3. Monitor not detected after 30 minutes. 4. Monitor warm-up error or other error.
Warning	**Yellow**	Sensor does not match the gas.
Warm-up	None	Instrument warm-up.
Ready	**None**	Instrument ready to bump test or calibrate.

Monitor warm-up

When you place a monitor in the Cradle and lock the capture mechanisms, the system automatically starts charging the instrument and initiates a warm-up cycle to prepare instruments for use with AutoRAE 2. For the warm-up cycle to commence, however, the monitors need to be either turned off or in AutoRAE 2 Communications mode.

The warm-up time depends on the sensors installed in the instrument and their individual warm-up requirements. During warm-up, the two Cradle LEDs labeled "Bump" and "Cal" glow orange in alternation and the instrument's name in the AutoRAE 2 Controller's display is accompanied by "Warm-up." When an instrument is warmed up, the two LEDs glow continuously green, and the AutoRAE 2 Controller's display shows the word "Ready" next to the instrument name without highlighting. (Note: If there is a sensor mismatch, the name is highlighted in yellow.) This indicates that you may now perform a bump test or calibration.

If the instrument fails to warm up, the Cradle's Bump and Cal LED lights will blink red in alternation and the buzzer will alarm. The AutoRAE 2 Controller's display highlights the instrument in red with the word "Error." Remove the monitor from the cradle and refer to the information on the instrument display.

Upgrade firmware without a PC

Firmware upgrades for the instruments can be done without connecting an AutoRAE
Controller/Cradle to a PC. However, this first requires connecting them to a PC for an init
upgrade (the upgraded firmware is loaded into the monitor and is saved in the AutoRAE
Controller's SD card). Subsequent upgrades using the same firmware can then be perfor
without a connection between the AutoRAE 2 and a PC.

1. Follow the instructions in the previous section to upgrade the firmware in one mo

2. After shutting down Safety Suite Device Configurator (SSDC) and disconnecting
   AutoRAE 2 Controller, make sure the AutoRAE 2 is turned on.

3. Follow the instructions in Section 3 to put a monitor that needs its firmware upgra
   the cradle.

4. In a few seconds, the AutoRAE 2 will check to see if the firmware in the monitor is up
   date. If it needs to be upgraded, the display will show "New instrument firmware ava
   Proceed to upgrade?"

5. You can press [Y/+] to start the upgrade immediately, or if you do not press any butto
   countdown will occur and the monitor will have its firmware upgraded automatic

   Note: If you want to decline the upgrade, press [N/-] to "Skip," and the upgrade will n
   performed.

   Note: If more than one cradle is connected to theAutoRAE 2 Controller, then multipl
   monitors' firmware can be upgraded at the same time.

During the upgrade, the display shows the current firmware version and the upg
version, plus the message "Don't move any part now".

Important! Do not disconnect power or remove the instrument from the cradle.

Note: While the upgrade is in progress, the alphanumeric display shows "bL" (for "bootload").

6. After the monitor is upgraded, the Controller shows the results:

7. With the upgrade completed, you can now remove the MicroRAE from the cradle.

IMPORTANT!

⌐ Test the monitor before placing it into service.

⌐ If you place a monitor into a cradle for another purpose, such as a bump test or calibr
and the AutoRAE 2 determines that firmware must be upgraded, it will perform the firm
upgrade, but it will not perform other subsequent operations unless you specifica
it to perform them. It will not, for example, perform the upgrade and then automat
to perform a bump test or calibration.

Testing

When the AutoRAE 2 Controller is turned on, it performs a self-test, SD card checks (wh
SD card is present, whether it is full or nearing full capacity, etc.), a test of each attached
AutoRAE 2 Cradle, and then a test of any instruments that are in the cradles. Bump testi
calibration can only take place on an instrument if its tests are passed, including cor
between the gas settings in the AutoRAE 2 Controller and the instrument.

Compatibility testing

The AutoRAE 2 Controller checks that the gas settings programmed into the AutoRAE 2
Controller match the settings in the instrument for each sensor and its calibration ga
is a mismatch, the "Status" column on the display shows "Warning." Press [N/-] to scroll t
instrument in the list that you want to read details on. Press [MODE] to get more info:

Information is available that describes the detected problem:

If there is a mismatch, check the instrument's settings in Programming Mode, as well as
settings programmed for theAutoRAE 2 via Safety Suite Device Configurator (SSDC

If all instruments in the cradles warm up and all test without errors or incompatibilitie
they are listed as "Ready":

23 PREPARING CONTROLLER

Preparing controller for bump testing & calibration

Before performing a bump test or calibration, the AutoRAE 2 must be set up (See "stand-AutoRAE 2 set up" on page 64 for more information.), have an SD card with sufficient av memory in it, power applied, and calibration cylinders connected.

SD memory card

The AutoRAE 2 Controller electronically stores system files and reports on a standard SD memory card, as well as system-specific data.

IMPORTANT!

The 2GB SD card that comes with the AutoRAE 2 Controller is pre-formatted and ready f (RAE Systems P/N 550-0300-000). If you purchase an SD card from another vendor, it c greater than 2GB, but only 2GB of space will be used by the AutoRAE 2 Controller.

Note: The SD card inside AutoRAE 2 can only be used for AutoRAE 2 recording. Do not other files to the SD card.

Although a 2GB SD card can hold approximately 3 years' worth of daily bump, calibration combined data for 500 instruments, transferring reports from the SD card to a PC every 6 months is recommended. This enhances data security and speeds the data-transfer

IMPORTANT!

The AutoRAE 2 cannot operate without an SD card in its slot.

Note: If no SD card is in the slot when the AutoRAE 2 Controller is turned on, or the SD is locked, or if the SD card is removed during operation, the display shows this message:

CAUTION

Do not remove the SD card from its slot or insert an SD card into an empty slot while
AutoRAE 2 Controller is running. This may damage the SD card or corrupt its data.

If the SD card is locked, the error message shown above is displayed. The AutoRAE 2 C
cannot write data to a locked SD card. Remove the SD card and unlock it by moving the
upward; then reinsert the SD card.

Unlocked SD Card   **Locked SD Card**

If remaining space for data on the SD card is very low, the display shows the message "S
running low on space." If the SD card is full, an error message appears on the display tha
"SD card full." Replace the SD card with another with more space on it, or offload the dat
computer. Then erase the data from the card, using your computer, and reinsert the SD c
back into the AutoRAE 2.

IMPORTANT!

Keep the SD card port cover closed whenever an SD card is not being inserted or remov
helps to keep the reading mechanism and the SD card clean, especially in dusty environ

Installing an SD card

1. Use a 2.0-size hex wrench to loosen and remove the screw holding the cover on the card port.

2. Slide the door down so that the port is visible.

3. Press the SD card into the slot with the angled notch on the right. Press until it locks place, making a "click" sound. Slide the door up to cover the port.

4. Insert and tighten the screw.

Loosen the hex screw that secures the cover   Remove the hex

Slide the cover down   Press the SD card into the sl

Removing an SD card

To remove an SD card, press in on it until it makes a click and pushes part of the way ou slot. Then pull it out with your fingers.

Connecting calibration gas to a controller

Connect cylinders of calibration gas to the inlet ports labeled "Gases" on the left side of t
AutoRAE 2 Controller. Make sure that they are connected to the correct inlet, as defined
Bottle settings. See "Gas inlet settings" on page 110 for more information..

All gas connections are barbed to secure the hoses to them. Appropriately non-reac
adsorptive tubing with a 1/8" I.D. should be used (Teflon for PID or corrosive or reactive g
Tygon for others). The cylinders must have demand-flow regulators (0 to 1,000 psig/
installed.

IMPORTANT!

Always check that the Gas Bottle configuration for each inlet on the AutoRAE 2 Controlle
matches the type/concentration of the actual calibration gas connected to it before y
any bump test or calibration. Also, make sure the calibration gas is not past its due date.

Note: When a cylinder of gas is empty, or has low pressure, it should be replaced.

No.	Item	No.	
1	Exhaust	3	AutoRAE 2 control
2	Calibration gas cylinders (each has a demand-flow regulator)	4	AutoRAE 2 cradles

Cross-sensitivities determine the order in which sensors should be calibrated

Gases used for calibration should be configured and connected to inlet 1, inlet 2, inlet 3,
the order in which the sensors should be calibrated. This applies to both a standalone cra
and controller-based systems. See "Connecting calibration gas to a Cradle" on page 31 f
more information.. Information on the order of calibration is available in Honeywell Te
Note TN-114 and TN-203.

Placing monitors in cradles

When you are ready to perform bump tests or calibration tests, place monitors in the crad
See "Placing a MultiRAE monitor in the cradle" on page 33 for more information..

Performing a bump test in a controller

The AutoRAE 2 Controller lets you perform bump tests on individual instruments or a
instruments that are cradled. A bump test can be initiated by pressing a Bump button on
Cradle or selecting a Bump Test via the AutoRAE 2 Controller menus.

Press [Y/+], which selects "Function":

A menu is shown, with "Bump Test" at the top of the list, already selected (the triangle to
right of the name indicates the selection):

When you press [Y/+] to click "Select," this screen appears:

Note: A grayed-out box indicates that it cannot be selected.

When you check "Bump All," the "Bump All" checkbox and all the other checkboxes for identified instruments are checked.

You can also select individual instruments for bump testing.

- Press [N/-] to scroll down the list.

- Press [Y/+] to toggle the selection between checked and unchecked.

- After you have made your selection(s), press [MODE] to start the bump test.

Press [N/-] to select "Exit," and then press [Y/+] to exit.

A screen shows the instruments to be bump tested and begins a countdown. All bump te
then performed automatically.

If there is a mismatch between sensors and calibration gas settings, then this message is
shown. The bump test countdown still proceeds. The sensors that do match the calibratio
settings will be bump tested.

Interrupting a bump test

Pressing the Abort button during a bump test suspends the test, and this message appears on the AutoRAE 2 Controller's display:

Removing an instrument from the cradle during a bump test interrupts it and results in the following message:

Press [N/-] to abort the bump test.

When all bump tests are complete, the display shows results:

This chart shows the meaning of the results:

Result	Description
Pass	All sensors passed successfully
Pass ?	All sensors that were tested passed successfully, but some sensors were no
Fail	The instrument failed one or more tests
N/A	The instrument was not tested

Select a menu item, and then follow through its screens. Navigation markers are located
the bottom of each screen.

Performing calibration

The AutoRAE 2 Controller lets you perform calibration on individual instruments or a instruments that are cradled. A calibration can be initiated by pressing a Cal button on the Cradle or selecting a Calibration via theAutoRAE 2 Controller menus.

Press [Y/+], which selects "Function":

A menu is shown, with "Bump Test" at the top of the list, already selected (the triangle to right of the name indicates the selection).

Press [N/-] until "Calibrate" is highlighted.

When you press [Y/+] to click "Select," this screen appears:

Note: A grayed-out box indicates that it cannot be selected.

You can select "Calibrate All" or individual instruments.

To select "Calibrate All," press [Y/+] to check the "Calibrate All" box.

You can also select individual instruments for calibration.

ⁱ Press [N/-] to scroll down the list.

ⁱ Press [Y/+] to toggle the selection between checked and unchecked.

ⁱ After you make your selection(s), press [MODE] to select "Done" and start the calibra

Press [N/-] to select "Exit", and then press [Y/+] to exit.

A screen shows the instruments to be calibrated and begins a countdown. All calibrations
then performed automatically.

Interrupting a calibration

Releasing an instrument from an AutoRAE 2 Cradle or otherwise interrupting a calib
suspends the test, and this message appears on the AutoRAE 2 Controller's display:

If you remove the instrument, calibration cannot resume. You must abort the calibrat
restart it. Press [N/-] to abort the calibration. This screen is displayed.

After calibration is complete, the AutoRAE 2 controller shows status:

When an instrument fails calibration, the word "Fail" is in the instrument's row, and the ro
highlighted in red. You can get a report for it and the other instruments in the system's cr
by pressing [Y/+] ("Report").

If an instrument does not pass calibration, check the sensor's age, and consult the instru
User's Guide.

Direct bump testing and calibration

Direct bump testing and calibrating via the cradles' buttons

When multiple AutoRAE 2 Cradles are connected to a Controller, they can still be used individually to perform a bump test or calibration.

1. Place one or more instruments in the Cradles.

2. Press either Bump or Cal.

You have five seconds to change your choice. After that, a screen with a list of the s instruments and your choices of Bump or Cal. are shown. If no instrument is in one cradles, or if you did not choose either option, then there is no selection indicated.

You can start the bump tests and calibrations immediately by pressing [Y/+]. Ot countdown begins. When it reaches zero, the bump and calibrations are initiated. Yo quit during this time (press [N/-]).

The instruments will undergo a bump test or calibration using parameters store attached AutoRAE 2 Controller. (A stand-alone AutoRAE 2 Cradle uses the con stored in its internal configuration.)

Configuration settings

In addition to showing status of the most recent bump and calibration testing, the ma
provides access to check settings and change the password. At the main screen, press [
which selects "Function":

Settings

At the main screen, press [Y/+], which selects "Function":

A menu is shown. Press [N/-] until "Settings" is selected (the triangle to the right of the na
indicates the selection):

Click [Y/+] to enter Settings.

A password screen is shown. You must input a password for Advanced access. (A Basic
level is reached with an incorrect password.)

The default value is "0000" (four zeroes).

⌐ Press [Y/+] to increase a value (0 through 9).

⌐ Press [N/-] to advance to the next digit.

⌐ Press [MODE] after you have entered the password.

If you enter an incorrect password, this screen appears:

If you have entered the correct password, you see the "Gas Settings" screen.

If you have entered an incorrect password again, then you access the Basic settings, wh
provides read-only information about the gases configured for each gas inlet:

To navigate between the settings types in Advanced mode, press [N/-].

To select, press [Y/+].

Gas settings

Gas Settings consists of read-only screens that show the gas configuration for each of th
gas inlets.

To advance through the settings, press [N/-]. The current screen is highlighted by th
circle in the series of circles representing the five inlets.

To exit from Gas Settings and return to the Settings screen, press [MODE].

System settings

In Advanced Mode, you can make changes to the system's settings.

System Settings (Advanced mode only) allow you to access the following:

Controller information

This is read-only information about the AutoRAE 2 Controller:

˫ Model

˫ Serial Number

˫ Firmware

˫ Built

Date

You can set the date according to the format set in Safety Suite Device Configurator (SS

Press [Y/+] to advance through numbers 0 through 9.

Press [N/-] to advance to the next digit.

Press [MODE] to save the new date.

Note: If you have already set the date by using Safety Suite Device Configurator (SSDC)
not need to set the date again. This screen is useful for checking that your date stamps a
correctly set.

Time

You can set the time according to the format set in Safety Suite Device Configurator (SS
Press [Y/+] to advance through numbers 0 through 9.

Press [N/-] to advance to the next digit.

Press [MODE] to save the new time.

Note: If you have already set the time by using Safety Suite Device Configurator (SSDC)
not need to set the time again. This screen is useful for checking that your time stamps a
correctly set.

Password

You can change the password at this screen, which shows:

꜀ Current Password

꜀ New Password

꜀ Press [Y/+] to advance through numbers 0 through 9.

꜀ Press [N/-] to advance to the next digit.

꜀ Press [MODE] to save the new password.

Action after bump failed

You can select the action performed by the AutoRAE 2 if a bump test fails. Your options a

꜀ Calibration if Bump Test Fail

꜀ Bump Test Only

꜀ Press [N/-] to advance to the next option.

꜀ Press [Y/+] to select the highlighted option or press [MODE] to go back, or press [N/-]
  advance to the next option.

꜀ Press [Y/+] to save your change or [N/-] to abort.

Network settings

Network Settings lets you set up communication with a PC.

ꞁ DHCP Enable/Disable

ꞁ Host IP Address

ꞁ Subnet Mask

ꞁ Default Gateway

ꞁ Port Number

DHCP Enable/Disable

You can enable or disable DHCP (Dynamic Host Configuration Protocol) at this scre

With DHCP Enable/Disable highlighted in the Network Settings menu, press [Y/+] to
Enable and Disable options. Note: The currently operational option is shown at the top in

ꞁ Press [N/-] to advance to the next option.

ꞁ Press [Y/+] to select the highlighted option.

ꞁ Press [MODE] to close the window and return to the main menu.

Host IP address

This is a read-only screen that shows the Host IP Address.

With Host IP Address highlighted in the Network Settings menu, press [Y/+] to access the
IP Address screen.

ꞁ Press [MODE] to close the window and return to the main menu.

Subnet mask

This is a read-only screen that shows the Subnet Mask.

With Subnet Mask highlighted in the Network Settings menu, press [Y/+] to access the S
Mask screen.

ꞁ Press [MODE] to close the window and return to the main menu.

Default gateway

This is a read-only screen that shows the Default Gateway.

With Default Gateway highlighted in the Network Settings menu, press [Y/+] to access th
Default Gateway screen.

ꞁ Press [MODE] to close the window and return to the main menu.

Port Number

You can view and change the Port Number at this screen.

With Port Number highlighted in the Network Settings menu, press [Y/+] to access the Po
Number screen. Note: The default value is 9800.

ꞁ Press [Y/+] to advance through numbers 0 through 9.

ꞁ Press [N/-] to advance to the next digit.

ꞁ Press [MODE] to save the new Port Number.

24 PROGRAMMING AN AUTORAE 2

Programming an AutoRAE 2 on the computer

When it comes to an AutoRAE 2 Controller-based system configuration, some param
as date and time, can be configured either on the PC or directly on the Controller screen
parameters, such as the AutoRAE 2 system password can only be configured directly on
Controller, whereas gas configurations (gas inlet settings), can be only configured on a P
Firmware updates for both the Controller and all the Cradles connected to it can also onl
done on a PC.

To program an AutoRAE 2 Controller-based system on a PC, you need Safety Suite Dev
Configurator Software, the AutoRAE 2 Controller-based system connected to a pow
and a USB PC communications cable.

1. Connect a USB cable between a PC with Safety Suite Device Configurator (SSDC) a
   AutoRAE 2 Controller.

2. Turn on the AutoRAE 2 Controller (with AC adapter connected and plugged in, power
   toggled so red LED light is glowing).

3. Start Safety Suite Device Configurator (SSDC) software on the PC.

4. Login with your username and password. By default the user name is "administrator"
   the password will be "Default123".

5. The program will begin performing a Startup Scan for any connected devices.

6. Locate the device on the device list and Click on the device's serial number.

Safety Suite Device Configurator (SSDC) shows all the information of the AutoRAE 2 Co
including information about the AutoRAE 2 Cradles attached to the AutoRAE 2 Cont

Note: The AutoRAE 2 Controller's display shows this message while it is connected and
communicating with a PC running Safety Suite Device Configurator (SSDC):

Click "Set Date Time" to check or set the time. Select the preferred date and time and cli
"Save".

To set the password for theAutoRAE 2, click on the window "PASSCODE". Type the 4 di
the new password and then click "Save".

Note: The default value is "0000."

Gas inlet settings

"Gas Inlet Information" tells the AutoRAE 2 what kind of gas is supplied to each gas inlet. "Gas Inlet Information" section includes configuration parameter settings for the five on the AutoRAE 2 Controller. For each "Gas Inlet," you can view and set the gas type, concentration, concentration unit, purge time, and soak time. You can modify these upload them to your AutoRAE 2 or download the values currently programmed into the AutoRAE 2 to Safety Suite Device Configurator (SSDC).

There are five gas configurations (Gas Inlet 1 through Gas Inlet 5), and each can be cust to suit the number and types of gases in each gas inlet.

Scroll down to see the "Gas Cylinders" section with the information of each gas cylinder.

The window now shows the Gas Cylinders Information, its Gas Number (number of gases gas mix, if the cylinder contains more than one gas; single gas shown), Gas Lot Number Expiration Date, and data that includes Gas Name, Concentration, Concentration Un Time (Sec.), and Soak Time (Sec.).

Configuring a gas cylinder

Each Gas Inlet section is designed so that you can define individual gases or gas combin[...] to match the cylinders you are planning to use with an AutoRAE 2 Controller-based syste[...]

Click on the "Edit" icon   to change Lot Number, Expiry Date, Gas Types, Concer[...] Purge Time, Soak Time, and add gases for each cylinder.

Gas number

This is the number of gases (up to eight) present in a single Gas Inlet. Click the up arrow [...] increase the number or the down arrow to decrease the number. Note: The number can [...] (0). This allows you to effectively remove the corresponding inlet from calibrations a[...] testing.

Gas lot number

Fill in the numbers to correspond to the lot number printed on the gas cylinder. This will b[...] included in any test and calibration certificates generated while bump testing or calib[...] instruments using this gas.

Expiration date

Click on each number and use the up/down arrows to change the date numbers to corres[...] to the expiration printed on the gas cylinder. This will be included in any test and calibrati[...] certificates generated while bump testing or calibrating instruments using this gas.

Gas index

The pull-down menus can be used to select Gas Index values corresponding to the gas [...] interest. Supported gases include:

1 – CO	8 - PH_3	15 - $COCl_2$	22 - Meth[...]
2 - H_2S	9 - HCl	16 - O_2	23 - Nitro[...]
3 - SO_2	10 - HF	17 - CH_3SH	24 - ETO
4 – NO	11 - Cl_2	18 - CO_2	25 – Hexa[...]
5 - NO_2	12 - ClO_2	19 - Isobutylene	26 – Buta[...]
6 – HCN	13 - H_2	20 - Benzene	
7 - NH_3	14 - HCHO	21 - Propane	

Note: Use the scroll bar to select the desired gas.

Gas name

To modify a Gas Name click the Edit icon and select the gas from the dropd
Click "Save" to save the selection.

Concentration [value] for controller

Set the concentration value by clicking the Edit icon . Click on the Concer
and enter de desired value. Click "Save" to save the changes.

Concentration unit for controller

Select the desired gas concentration unit (there are other types of units) from the
Concentration Unit dropdown menu.

ppm

%

ppb

μg/m^3

mg/m^3

%LEL

%VOL

%CH4

μ

μ mol/mol

x10^6

Purge time (sec.)

Set the purge time value by clicking the Edit icon . Click on the Purge Time
enter de desired value. Click "Save" to save the changes.

Soak time (sec.)

Set the soak time value by clicking the Edit icon . Click on the Soak Time se
de desired value. Click "Save" to save the changes.

Uploading settings to the AutoRAE 2

When you are done setting the Gas Cylinder parameters, click the Save button.

Update will be automatically uploaded to the AutoRAE 2. A green notification will appear the configuration has been succesfully saved.

Saving the settings file for controller

To save the configuration (including sensor configuration) of an instrument to a file, Instrument (Connected only) in the device list screen.

This could be a RAE by Honeywelldevice connected though a travel charger, cradle or A 2 controller. Click on the serial number link to navigate to the device details screen.

Save as File: To save the details to a file, Click on

Saves the configuration of this device as a file (with.ssc extension).

Click on Save.

Configuration files

If you have previously stored settings in a separate file, you can call them up so that you
modify them and/or apply them to the AutoRAE 2 system. This feature is especially usef
you have multiple individual systems to which similar settings need to be populated.
can be opened and viewed later from anySafety Suite Device Configurator (SSDC) insta
view the file:

   1. Click on

   2. Select   from the dropdown menu.

   3. The configuration can also be updated and saved back to the file or can be applied t
      another device with the same make and model.

   4. Apply to Device: To apply the changes or configuration to a device, Select Apply to D
      from the below screen.

5. Select a Device to apply the configuration from the list of devices.

6. Click on the Tick box.

7. Select Save.

8. The Configuration is applied to the Instrument.

Note: Currently the Configuration can only be applied to device that have the same firmw
version. If the device you want to apply the configuration file is not on the same version,
upgrade / downgrade the firmware to match the version before applying.

Uploading settings to multiple AutoRAE 2 systems

You can apply settings to multiple AutoRAE 2 systems. Simply connect one system to th[e]
and upload the settings as outlined in the previous section, disconnect that system,
another, and then upload settings.

Exiting programming in a controller

When you are done programming and have saved the settings, do the following:

1. Exit Safety Suite Device Configurator (SSDC).

2. Press [MODE] on the AutoRAE 2 Controller to exit Communications Mode.

3. Disconnect the USB cable between the PC and the AutoRAE 2 Controller.

25   UPDATING CONTROLLER FIRM

Updating firmware on the AutoRAE 2 controller

Updates to the AutoRAE 2 Controller's firmware may be produced, and these can be load
the AutoRAE 2 Controller using Safety Suite Device Configurator (SSDC) software runnir
PC.

   1. Connect the Device to PC using the USB cable.

      Note: The connected device is indicated with symbol "   "

   2. Click on the Device serial number to access the details screen. Find the current firmw
      version in the details screen as highlighted.

   3. Click on 'Update' button. If the PC is connected to internet and the 'Firmware updates
      using local file' setting is not checked, clicking the update button would set the firmw
      the latest version supported for the device.

4. If PC is not connected to internet or if the 'Firmware updates using local file' setting is checked you can apply the firmware manually as below:

  - Click the 'Update' button.

  - Click on "Choose file" in the "Update Firmware Version" selection dialog box. Th firmware can be downloaded from: https://sps.honeywell.com/us/en/softw

  - Browse to select the firmware file to apply (.rfp file).

5. The firmware update will start.

6. The device is upgraded to the selected firmware.

7. When the update is complete, exit Safety Suite Device Configurator (SSDC) on the F

8. Disconnect the USB cable.

26 TRANSFERRING DATA

Transferring AutoRAE 2 controller data to a computer

Bump and calibration data is collected each time an instrument is bump tested or ca
The AutoRAE 2 Controller collects this data and stores it on an SD Card, providing a con
means of storage and easy data transfer.

To download data to a computer from the device follow the next steps:

1. Connect a USB cable to the AutoRAE 2 Controller and to a PC running Safety Suite I
   Configurator (SSDC) software

2. Make sure the AutoRAE 2 Controller has power and is turned on.

3. Start Safety Suite Device Configurator (SSDC) software on the PC.

4. Select the Controller from the device's list and click on "Download Data"

Bump Test and Calibration results can also be downloaded from Safety Suite Device
Configurator (SSDC). Just click on Bump/Cal Results

1. Select the results to be downloaded and click on "Export Test Results".

2. Click "Browse" to select the location to download the file.

3. Select the type of file to be downloaded from the pop-up window.

4. A green notification will be shown in the top right corner when the file is downloa

Exporting reports

The report can be exported for archiving or sending. It can be saved as a CSV file, makir easy to import into most word-processing programs such as Microsoft Word, or it can be as a text file (.txt). To download, follow the process mentioned in the previous section.

27 WIRELESS OPERATION

The AutoRAE 2 Controller can communicate wirelessly with a PC running Safety Suite D
Configurator (SSDC), and operates in the same manner (that is, the wireless connection
substitutes for a hardwired connection). This requires purchasing an optional Wi-Fi A
and configuring it properly for your network. It also requires configuration of the Auto
Controller.

Software and firmware requirements:

ˡ Safety Suite Device Configurator (SSDC) V3.1.0.2837 (or newer)

ˡ AutoRAE 2 controller firmware V1.20 (or newer)

ˡ AutoRAE 2 Utility V1.02 Build 105 (or newer)

Note: This procedure has been tested with NetGear's WNCE2001 Universal Wi-Fi Intern
Adapter (or equivalent)

Configure the AutoRAE 2 network interface

1. Connect an Ethernet cable between the PC and the AutoRAE 2 Controller.

2. On the AutoRAE 2 Controller, enter Function and then Settings choose "Select."

3. When the dialog box appears, input your password. Select "Done."

4. Now choose Network Settings and "Select" again. The first option is DHCP Enable/D (see Figure 1).

Figure 1. AutoRAE 2 Network Setting Menu.

5. Enter or verify network settings. Following is an example that works with its relative F settings throughout this procedure.

   a. Disable DHCP.

   b. Set the Host IP Address, which is the address of AutoRAE 2 Controller. (The foll values are for reference only; use values specific to your network.)

   Note: The AutoRAE 2 Controller is the host (or server) when connected to the Ethernet.

   Enter: 172.16.121.25

   Subnet mask: 255.255.255.0

   Default gateway: 172.16.121.1

6. Restart the AutoRAE 2 Controller (turn it off and on again).

7. Set the corresponding PC Ethernet port IP address, subnet mask, and default ga
   manually as shown in Figure 2 for connection to AutoRAE 2.

Figure 2. Manually Set PC network properties for connection to AutoRAE

8. Run Safety Suite Device Configurator (SSDC). The program should be able to detec
   AutoRAE 2 Controller via the Ethernet cable and communicate with the AutoRAE 2
   Controller normally.

Configure the Wi-Fi adapter

Configure The Wi-Fi Adapter & Test The Network

Disconnect the Ethernet cable from the PC and the AutoRAE 2 Controller. You will now u
PC's built-in Wi-Fi wireless modem and a Wi-Fi Internet Adapter connected to AutoRAE 2
Communication will be over a wireless network.

1. Keep all the network settings that you provided in Part One. Disconnect and remove
   Ethernet cable.

2. Connect a Wi-Fi Internet Adapter (the Netgear WNCE2001 NetGear Universal W
   Internet Adapter is recommended) to the PC's network port using the Ethernet cable
   shipped with the Wi-Fi Internet Adapter. Connect power to the Wi-Fi Internet Adapte

3. Open the Internet Protocol (TCP/IP) Properties of the PC network port. Set "Obtain a
   address automatically" as in Figure 3 for the Wi-Fi Internet Adapter setup. Also mak
   the "Obtain DNS server address automatically" button is selected.

Figure 3. Set PC network properties to automatic for the Wi-Fi Internet Adapt

4. Make sure that the PC has no other Ethernet connection (wired or wireless), except t
   connection to the Wi-Fi Internet Adapter. Open a web browser in Windows. The Wi-
   Internet Adapter setup menu will be shown as Figure 4 to Figure 6. Note: You must
   region. Then click the "Continue" button.

5. Following the process shown in Figure 4 to Figure 6, select a wireless network, enter
password for the wireless network, and confirm settings/connection.

Figure 4. Select a wireless network. (This example shows all available wireless n
within range. Your choices will be different.)

Figure 5. Enter a password to access the selected wireless network.

Figure 6. Confirm that the Wi-Fi Internet adapter successfully connected to th
wireless network.

6. Exit the Wi-Fi Internet Adapter setup. Unplug the Ethernet cable between the Wi
Adapter and the PC, and connect it to the AutoRAE 2 Controller.

7. Restart the AutoRAE 2 Controller.

9. Enable the PC's Wi-Fi and connect the PC to the same wireless network as the Wi-F
   Internet Adapter. (In this example, the wireless network used is RAEGN as shown ir
   4.)

10. There are two ways to connect, using manual or automatic connection.

    a. Manually. Open the corresponding TCP/IP properties of the PC Wi-Fi (wirele
       Manually set the IP address, subnet mask and default gateway as shown in Fig
       for connection to the AutoRAE 2 Controller, which has DHCP disabled.

    b. Automatically (DHCP enabled). At the AR2 site, enter the AutoRAE 2 network se
       menu. (See Figure 3.) Enable the DHCP function of the AutoRAE 2 Controller I
       port then exit to AR2 normal mode. Keep the PC wireless port setting as showr
       Figure 3 (that is, set it to get the IP address automatically).

11. Close the Windows Properties dialog box and wait for a few seconds. The PC will wir
    connect to the AutoRAE 2 Controller.

12. Run Safety Suite Device Configurator (SSDC) software, which should be able to dete
    AutoRAE 2 Controller via Wi-Fi connection and communicate with the AutoRAE 2
    Controller.

No.	Item	No.	
1	PC with wireless connection	3	Wi-Fi internet adapt
2	Wireless netwrok	4	AutoRAE 2 controll

28 WALL MOUNTING

The AutoRAE 2 can be used on a flat surface, or it can be mounted on a wall. This requir
drilling holes into the wall and inserting screws to hold the AutoRAE 2.

Note: Handheld PID Cradles cannot be wall-mounted.

Important! Make sure the wall is strong enough to support the weight of the AutoRAE 2
Controller and attached AutoRAE 2 cradles. If necessary, mount a piece of plywood or us
reinforcement for the wall.

Use a pair of slotted TS35 DIN rails (35mm high x 7.5mm deep) cut to slightly longer than
length of the assembled system and attach to a strong wall or other rigid surface using lo
profile screws. Make sure the center-to-center spacing of the slotted rails is 135 mm

Once the rails have been firmly fastened to the wall, slide the AutoRAE 2 Controller from
side onto the rails. Then slide an AutoRAE 2 Cradle onto the rails from the right side. Ma
that the last AutoRAE 2 Cradle has the Terminal Adapter from the AutoRAE 2 Controller
attached.

Once all the AutoRAE 2 units have been slid onto the rails, press them together, insert th
screws to secure them to each other, and then place the plastic caps over the screws. Re
section 20 for assembly details.

Make sure that the power cord and the AC Adapter, as well as all gas lines are properly
protected from damage and tampering.

29 TRANSFERRING DATA

Transferring bump and calibration data

Bump and calibration data is collected in the instruments' datalog each time an instr
bump tested or calibrated. To download the data, consult the instruments' User's Guide.

30 MAINTENANCE

Occasional cleaning of the AutoRAE 2 Controller and AutoRAE 2 cradle exterior is recommended. Use a damp cloth (water only, no solvents or cleaners) to wipe the exterior and the dock area. Do not use alcohol or solvents.

Inspect the ports in the dock and the space around and between the buttons and the case. If dirt has settled into any of these places, use a can of compressed air to blow it out.

Inspect the gas connections and make sure the tubing from gas cylinders is not damaged or cracked.

Inspect the optical sensor(s) on cradles to make sure they are clean. Dirty optical sensors degrade testing performance for instruments' LED alarms, and may incorrectly cause an instrument to fail an alarm functional test while in the cradle.

Check the filters on the air inlets often, making sure that dirt and debris do not build up and affect performance.

Important! Never use sharp tools or solvents to dislodge small obstructions. If debris is in any portion of the AutoRAE 2 Controller or AutoRAE 2 Cradle and cannot be removed with compressed air or soft cloth, refer it to qualified service personnel.

31 TECHNICAL SUPPORT

To contact Honeywell Technical Support:

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