

ABB MEASUREMENT & ANALYTICS | SYSTEM MANUAL

ABB Ability™ Mobile Gas Leak Detection System (MobileGuard™)



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1 Preface

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Disclaimer

This document contains product specifications and performance statements that may be in conflict with other ABB published literature, such as product flyers and product catalogs. All specifications, product characteristics, and performance statements included in this document are suggested specifications only. In case of conflict between product characteristics in this document and specifications in the official ABB product catalogs, the latter takes precedence. ABB reserves the right to make changes to the specifications of all equipment and software, and to the contents of this document, without obligation to notify any person or organization of such changes. Every effort has been made to ensure that the information contained in this document is current and accurate. Please contact ABB if you find any error in this document, so we can make appropriate corrections.

Cybersecurity Disclaimer

This product is designed to be connected to and to communicate information and data via a network interface. It is operator's sole responsibility to provide and continuously ensure a secure connection between the product and your network or any other network (as the case may be). Operator shall establish and maintain any appropriate measures (such as but not limited to the installation of firewalls, application of authentication measures, encryption of data, installation of anti-virus programs, etc.) to protect the product, the network, its system and the interface against any kind of security breaches, unauthorized access, interference, intrusion, leakage and/or theft of data or information. ABB, Inc. and its affiliates are not liable for damages and/or losses related to such security breaches, any unauthorized access, interference, intrusion, leakage and/or theft of data or information.

Customer Support

ABB provides product support services worldwide. To receive product support, either in or out of warranty, contact the ABB office that serves your geographical area, or the office indicated below:

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Text Formats and Warning Icons

Text Formats

This section describes text formats and warning icons used in this manual.

- *Italicized* text is used for emphasis in text and also to emphasize the names of screens or text fields.
- Bold text is used to show text that you type in fields and also button choices that you enter.

Warning Icons

Warning icons used in this manual are shown and described below.

⚠ NOTE OR IMPORTANT!

Emphasizes facts and conditions important to analyzer operation.

WARNING!

General Warning icon: gives general safety information that must be followed to avoid hazardous conditions.

2 Introduction

Scope

This manual covers the use and operation of the MobileGuard™ system.

For information on the ABB LGR-ICOS[™] GLA232-MEA Methane/ Ethane Analyzer, refer to the ABB LGR-ICOS[™] GLA232 Series Methane/Ethane Analyzer User Manual.

Refer to the ABB ICOS FastScanner[™] Software User Manual for guidelines on installing the MobileGuard[™] software and generating reports. The ABB ICOS FastScanner[™] Software User Manual also describes the software menu, data screens, and report details.

System Description

The MobileGuard[™] system is a powerful and state-of-the-art tool for detecting and estimating the location of natural gas emissions from roadways. The following are key of the system:

- ABB LGR-ICOS[™] GLA232-MEA Methane/Ethane Analyzer ABB laser-based technology measures both methane and ethane for highly reliable results, thus distinguishing between pipeline gas and other methane sources
- Global Navigation Satellite System (GNSS) provides local coordinates
- Sonic anemometer measures wind speed and direction
- User interface (UI) software maps gas concentrations in real-time and stores data which can be transmitted to your Google Drive storage location in real-time

These components work together to efficiently pinpoint natural gas emissions in a timely manner.

3 System Hardware

Overview

Before proceeding with the installation, ensure that the vehicle meets the requirements outlined in the "Vehicle Readiness Checklist". Installation of the MobileGuard[™] system varies significantly from vehicle to vehicle.

\land WARNING!

Only qualified personnel with electrical experience should perform the MobileGuard[™] installation.

Parts and Tools

Parts

Unless otherwise mentioned, all parts listed below are provided with the MobileGuard $\ensuremath{^{\text{TM}}}$ system.

- Chassis Fastener kit option; not provided with MobileGuard[™] system. Refer to "Kits, Accessories, and Service Items" for details.
- Annual Maintenance Kit option; not provided with MobileGuard[™] system. Refer to "Kits, Accessories, and Service Items" for details.
- Battery-to-Analyzer cable 2 each
- Battery fuse
- Inlet-to-Trunk kit
- Yakima Round-Bar Roof-Mounting system
- 23 inch Speed Rail Bar
- 24 inch Speed Rail Bar
- Vertical Speed Rail Bar (cut to size)
- Mast knuckle adapters 5 each
- Speed Rail wye 4 each
- Speed Rail tee
- Sonic anemometer with cables
- GNSS antenna
- 10 foot TNC cable (for GNSS antenna)
- Magnetic cable tie mounts
- Zip ties
- Microsoft Surface Pro Tablet
- Cradlepoint WiFi router with 3G/LTE
- 12 inch Ethernet cable
- GLA232-MEA Methane/Ethane Analyzer

Tools

All tools listed below are customer-supplied.

- + $\ensuremath{^{1\!\!/_2}}$ inch wrench or socket wrench
- Allen wrench for toggle bolt
- Voltmeter
- Tape measure
- Painter's tape
- 3/16 inch Allen wrench
- Flat-head screwdriver large
- Flat-head screwdriver small
- ¹¹/₁₆ inch wrench 2 each
- Wire brush
- Sandpaper

Vehicle Readiness Checklist

Requirements

- Trunk is large enough to accommodate the analyzer
- Instrument location is climate-controlled
- Roof rack can accept Yakima TimberLine System
- Roof-rack bar spacing is approximately 61 cm (24 in)
- Vehicle battery terminals are accessible
- Alternator is producing between 12.7 V and 14.5 V
- Adequate clearance for cabling and tubing to enter trunk
- Inlet mount point is appropriately positioned
- Activated cellular SIM card compatible with the carrier version of the Cradlepoint router ordered with the MobileGuard[™] System
- AC charging point is available for tablet/laptop

Contact ABB Sales if any of the readiness requirements cannot be met.

Vehicle Interior

Nearly all vehicles have a trunk space large enough to accommodate the analyzer, which measures 67 cm L x 50 cm W x 18 cm H (26.4 in L x 19.7 in W x 7.1 in H). Any trunk space that accommodates these dimensions is acceptable.

Analyzer Mounting

The analyzer may optionally be hard-mounted to customersupplied vehicle mounting. The analyzer is 48.3 cm (19 in) rackcompatible and includes 10-32 screw holes at intervals along the side panels which can be used to attach L-brackets.

Climate Control

An important requirement for sustained operation is that the analyzer be placed in a climate-controlled environment, that is, in the passenger cabin of the vehicle. For this reason, ABB recommends using a small SUV or hatchback-style vehicle.

▲ IMPORTANT!

The analyzer cannot be operated in a closed trunk because the air space overheats.

A large vehicle is not required for MobileGuard[™] operation. Smaller vehicles are more beneficial because a shorter anemometer mast height reduces the chances of the anemometer striking trees, buildings, and other overhanging objects.

Rooftop Assembly

Mounting the anemometer on the vehicle requires attaching 2.54 cm (1 in) diameter round bars to the vehicle roof. The preferred mounting hardware is Yakima TimberLine System which can be quickly and securely attached to a raised-roof rail. Figure 1 illustrates the difference between raised- and flushroof rails.

Flush rails require a custom installation, which may not be possible depending on the vehicle manufacturer's configuration. Contact ABB Sales before selecting a vehicle with flush rails.

A custom installation is required for vehicles without a manufacturer-installed roof rack. Contact ABB Support for information on installing MobileGuard[™] on vehicles with a bare roof.

There are two basic types of factory rails, Raised Rails, and Flush Rails.





Raised rails are raised up off of the vehicle's roof.

Flush rails are flush with the vehicle's roof

Figure 1 Raised vs. Flush Rails

Anemometer Placement Guidelines

Important factors when deciding how the anemometer is mounted to the vehicle are:

- The anemometer height should be approximately 229-279 cm (90-110 in) above the ground.
- The larger the distance between the vehicle roof and the anemometer, the better.
- The anemometer should be as far forward as possible to avoid windshield-induced wake turbulence.
- Light bars, roof-rack wind breaks, and other flow-disrupting objects should not be mounted in front of the anemometer.

System Power and Battery Access

The MobileGuard[™] system is powered by direct access to 11.5-15 V DC power from the vehicle's battery which receives power from the alternator while the engine is running. Standard vehicle batteries can be used as power sources. The measured alternator voltage should be approximately 14.4 V for standard automotive batteries and 12.7 V to 14.4 V for Absorbent Glass Mat (AGM) batteries.

Terminal Access

Battery terminal access and appropriate terminal lugs are required. If the terminal is not directly accessible, an alternative connection point must be provided. For example, the 2017 Ford Escape has an inaccessible negative terminal, however, the jump lug or vehicle frame can be used as a return.

▲ IMPORTANT!

Many newer vehicles use automatic engine start/stop technology to reduce fuel consumption. If a vehicle with automatic start/stop is used, it must have a manual override that is always engaged when operating MobileGuard[™]. Starting a car engine routinely drops battery voltage below 10 V DC, which may force a restart of the analyzer.

ABB recommends against using hybrid or electric vehicles for MobileGuard™.

Although the analyzer adequately operates on battery power, do not start the vehicle engine while the analyzer is running.

Inlet Mounting Area

The front bumper of the vehicle must have an appropriate mounting location to affix the 3D printed inlet. Nearly all vehicles have an appropriate location. The inlet may be temporarily attached using high-bonding strength Velcro, or permanently attached using sheet-metal screws installed in the bumper plastic.

Inlet Placement Guidelines

The inlet should be:

- as near as possible to the curb side of the road without extending beyond the vehicle width.
- minimum 61 cm (24 inches) from the ground, and should not be the lowest object on the front of the vehicle.
- as close to the side of the car as possible, but such that the splash guard (or fender) provides protection of water splashing towards the inlet.



Figure 2 Inlet Placement Example

4G/LTE Connection

The MobileGuard[™] system requires an internet connection to view map data and upload drive packages to your Google Drive storage location. This internet connection is customersupplied via a cellular SIM card. This SIM card must be 2FF form factor (North America / Europe / APAC) and compatible with the carrier version of the Cradlepoint router ordered with the MobileGuard[™] System. Carrier compatibility information may be found at:

<u>https://cradlepoint.com/products/cor-ibr200</u> or by contacting ABB Support (icos.support@ca.abb.com).

120/240 V AC Charge Point

Because laptop and tablet batteries rarely last through a full day of surveying, it is recommended that the vehicle includes an AC plug that can be used to charge the UI laptop. Many vehicles have built-in inverters. However, if this is not available in your selected vehicle, contact ABB Sales to add the optional inverter to your MobileGuard[™] system.

Non-Standard Installations

It is usually possible to install MobileGuard[™] in non-standard vehicles, such as Kubota UTVs. Contact ABB Support for information.

Hardware Installation

Battery Cable and Inlet Tubing

▲ WARNING!

Only qualified personnel with electrical experience should install the battery cable.

WARNING!

The route selected should avoid sharp edges and high-temperature engine elements.

Battery Cable Installation

WARNING!

Do not attach the positive (+) red connection to the battery until the cables have been routed through the vehicle and have been tested for proper connectivity.

Figure 3 shows a schematic overview of typical battery cable routing and attachments.



Figure 3 Typical Battery Cable Routing and Attachments

1 Locate the vehicle firewall on the driver's side (typically located under the steering wheel). See Figure 4 for an example.



Figure 4 Power and Inlet Tube Passed Through Vehicle Firewall

2 Route the positive (+) red cables through the firewall of the vehicle so that the terminal lugs are in the engine compartment, and the gray battery connector end of the cable is in the cabin of the vehicle (see Figure 5).



Figure 5 Terminal Lugs in Engine Compartment

3 Inside the engine compartment, attach the lugs on the red power cables to the unoccupied end of the fuse box. See Figure 6 for proper orientation of the two battery cable lugs inside of the fuse box. Use a ½ inch wrench (or socket wrench) to tighten the nut that secures the terminal lugs in the fuse box.



Figure 6 Orientation of Battery Cable Lugs Inside Fuse Box

4 Securely fasten the fuse box to a suitable location in the engine compartment. See Figure 7 for an example.

WARNING!

Do NOT connect the fuse box to the vehicle battery at this stage. The vehicle battery should not be connected to the fuse box until the cables have been fully routed through the vehicle and checked for proper continuity.



Figure 7 Fuse Box Secured to Vehicle Chassis Inside Engine Compartment

5 Run the two red power cables along the driver's side of the vehicle (beneath the paneling when possible) and into the trunk compartment so that the gray battery connectors are easily accessible. See Figure 8 for an example.



Figure 8 Example of Battery Cables and Inlet Tubing Routed into Vehicle Trunk

- 6 Locate a suitable location to connect the negative (-) black cables to the chassis of the vehicle, preferably a location near the trunk of the vehicle.
- 7 Use sandpaper to remove any paint or oxidation from the mounting location (Figure 9).

The paint on the chassis is generally not conductive, so it must be removed using an abrasive, such as sandpaper.



Figure 9 Mounting Location for Negative Terminal Lugs on Battery Cable

8 Securely fasten the negative (-) black lugs to the vehicle chassis using either the toggle bolts (preferred) or the two self-tapping screws provided in the Chassis Fastener kit. (See Figure 10.)



Figure 10 Negative Leads Fastened to Vehicle Chassis Using Toggle Bolt

9 Using a voltmeter, check that the black terminals on each battery connector have low resistance (less than 2 ohms) to a test point on the vehicle chassis. The exhaust pipe typically offers a convenient access point for this measurement. See Figure 11 for an example.



Figure 11 Test Negative (-) Black Battery Connector Terminals

 10 Using a voltmeter, check that the red and black terminals on each battery connector are isolated from each other. See Figure 12 for an example test setup to measure resistance or voltage between battery connector terminals.



Figure 12 Example to Measure Resistance or Voltage Between Terminals

- **11** Remove any debris or oxidation from the positive (+) terminal of the vehicle battery using a wire brush.
- 12 Carefully attach the lug of the short red cable from the fuse box to the battery terminal.
- **13** Secure all cables inside of the engine compartment so that they will not move as the vehicle vibrates.
- 14 With the engine turned off, use a voltmeter to check that the voltage across the two leads of each gray battery connector is now approximately 12 V DC (see the example test setup in Figure 12).
- **15** Turn the vehicle engine on. The voltage across the terminals of the battery connectors is now supplied by the vehicle's alternator. Check that this voltage is less than 16 V DC.
- 16 Turn the vehicle off.
- **17** Using the gray battery connectors, attach the two Batteryto-Analyzer cables.

Inlet Tubing Installation

Gas is sampled from $\frac{3}{6}$ inch tubing attached to an inlet that is fastened approximately 15.24 cm (6 inches) from the ground on the passenger side of the vehicle (see the example in Figure 13). This location is ideal to sample as close to the ground as possible, while minimizing the chances of pulling water or dirt into the sampling inlet.

WARNING!

Avoid submerging the inlet to prevent liquid water from entering the analyzer: If water enters the analyzer's optical cavity, extensive cleaning may be required.



Figure 13 Example of Properly Installed Gas-Sampling Inlet

- 1 Route the ³/₈ inch tubing provided in the Inlet-to-Trunk kit through the vehicle firewall (Figure 4).
- 2 Find an appropriate path to route the tubing through the engine compartment and through the lower part of the front radiator grill. This path should avoid sharp edges or high-temperature engine components.
- **3** Route the other end of the tubing through the vehicle and into the trunk compartment, taking care to not over-compress or crimp the tubing.
- **4** Zip-tie the inlet tube in place in the engine compartment to prevent vibration-induced damage (Figure 7).
- 5 Attach the inlet filter assembly to the front bumper: Use either the Velcro tape provided in the Inlet-to-Trunk kit or self-tapping screws through the mounting holes on the inlet.
- 6 Slide the ³/₈ inch Swagelok nut and ferrules onto the ³/₈ inch tubing (Figure 14) and carefully tighten the Swagelok nut 1 ¹/₄ turns onto the male Swagelok fitting on the inlet.



Figure 14 Swagelok Ferrules Assembly Order

WARNING!

Over-tightening the Swagelok connections or NPT fitting on the inlet may damage the inlet.

Roof Mast

Ensure the raised roof rack on the installation vehicle meets the requirements outlined in the "Vehicle Readiness Checklist". Install the Yakima roof rack according to the provided instructions with the modifications described in the following section.

Yakima Round Bar Installation

- 1 When preparing the front cross-bar:
 - a Slide the Round Bar through one rail attachment.
 - **b** Slide a knuckle adapter and the Speed Rail tee onto the Round Bar.
 - c Slide the Round Bar through the second rail attachment.
- **2** Use a measuring tape to determine where the halfway mark is on the front Round Bar and mark that location with a small piece of painter's tape (see Figure 15).



Figure 15 Assembled Front Round Bar with Blue Painter's Tape Marking Middle

3 Mount the front Round Bar as far forward on the vehicle's raised roof rack as possible (see Figure 16).



Figure 16 Front Round Bar Assembly Mounted on Roof Rack

4 When preparing the rear Round Bar assembly, slide the Round Bar through one rail attachment, then slide four knuckle adapters and two Speed Rail wyes onto the Round Bar before sliding it through the second rail attachment (see Figure 17).



Figure 17 Rear Round Bar Assembly

5 Mount the rear Round Bar assembly approximately 61 cm (24 inches) from the front Round Bar assembly (see Figure 18).



Figure 18 Mounted Rear and Front Round-Bar Assemblies 24 Inches Apart

Speed Rail Mast Installation

- 1 A 30 inch piece of black powder-coated aluminum Speed Rail is provided as the vertical post on which the sonic anemometer is mounted: This piece of Speed Rail must be cut to size so that the top of the anemometer is approximately 279 cm (110 inches) from the ground. To determine the proper length of the Speed Rail bar, measure the distance from the ground to the front Round Bar. The length of the vertical bar should be approximately 239 cm (94 inches) minus this measured distance.
- Insert the vertical Speed Rail bar into the socket on the tee mounted to the front crossbar, then lock it into place using a ³/₁₆ inch Allen wrench to tighten the set screw.
- 3 Slide two Speed Rail wyes onto the vertical post (Figure 19).



Figure 19 Vertical Speed Rail Bar with Two Wye Fittings

- 4 Slide the knuckle adapter into the Speed Rail tee used to mount the vertical post on the front crossbar, then tighten this into place with the vertical post oriented vertically at the marked location in the middle of the crossbar.
- 5 Insert the 23 inch Speed Rail bar into the socket on the wye on the driver's side of the rear crossbar, then tighten this into place using an Allen wrench on the set screw.
- 6 Insert the other end of the 23 inch Speed Rail bar into the bottom wye attached to the vertical bar on the front crossbar, then tighten into place.
- 7 Insert the 24 inch Speed Rail bar into the socket on the wye on the passenger side of the rear crossbar, then tighten into place.

- 8 Insert the other end of the 24 inch Speed Rail bar into the top wye on the vertical crossbar, then tighten into place.
- **9** Ensure the vertical bar is truly vertical and tighten the 23 inch and 24 inch Speed Rail bars into the sockets on the rear crossbar wyes.



Figure 20 Full Assembly of Roof Mast

- **10** Visually inspect the roof rack. You may have to repeatedly loosen or tighten the Speed Rail connections to perform slight changes to the alignment of the vertical post.
- **11** Place the anemometer on the vertical Speed Rail post. Rotate the anemometer so that the black junction box faces forward. Tighten the bolt on the hose clamp with a flat-head screwdriver to secure the anemometer in place (Figure 20).

▲ IMPORTANT!

Proper orientation of the anemometer is critical for making accurate estimations of the wind direction. Evaluate the anemometer orientation, by eye, from a variety of vantage points to ensure it is properly aligned with the vehicle. (See Figure 21.)



Figure 21 Schematic of Proper Anemometer Orientation

GNSS Antenna and Exterior Cable Routing

 Place the magnetically mounted GNSS antenna on the roof of the vehicle, then attach the 10 foot TNC cable to the antenna (Figure 22).



Figure 22 Placement of GNSS Antenna and Cable Routing

- **2** Route all GNSS and anemometer cables through a region of the trunk door's compressible weatherproofing material so that closing the trunk door does not damage cabling.
- **3** Route cables along the exterior of the vehicle using zip ties and the provided magnetic cable-tie mounts.

Analyzer Power-On

- 1 Place the analyzer in the trunk of vehicle in a position in which the front and rear fans are not impeded.
- **2** Attach the water-dropout trap and filter assembly to the analyzer by first hand-tightening the water-trap mount screws to the rear panel of the analyzer.
 - Water Dropout Filter Assembly

 Sample Air Inlet Tube

 Wireless Router

 Filter

 Big Strate Strates

 Exhaust Waste Optionality

 Gas Inlet

Figure 23 Analyzer Connections Overview

- **3** Connect the GNSS antenna cable to the TNC bulkhead labeled *GPS Sensor* and the coaxial Anemometer Power cable to the *Anemometer Power* port on the analyzer rear panel.
- 4 Connect the anemometer signal cable to the *Anemometer* port on the analyzer rear panel and use a small flat-head screwdriver to secure the anemometer connector in place.



Figure 24 Analyzer Rear Panel Close-Up

- 5 Attach inlet tubing to the water dropout trap: Use two ¹¹/₁₆ inch wrenches to connect. If the Swagelok nut and ferrule assembly are not on the inlet tube, follow the Swagelok assembly instructions in the "Inlet Tubing Installation" section to attach the inlet tube to the water dropout trap.
- 6 Ensure the analyzer front-panel switch is in the Off position.

4 Network Communications Configuration

Overview

A local network in the MobileGuard™ vehicle is established using the provided Cradlepoint router. Before powering on the analyzer, ensure that the router power is connected.

Configure Router

Once the analyzer is powered on, the Cradlepoint router should also turn on. It takes approximately 2 minutes for the router to boot and be ready for users to connect. The Cradlepoint router's SSID and default password/key are provided on a label on the bottom panel of the router, as shown in Figure 25.



Figure 25 SSID and Password Shown in Red Box



Figure 26 Schematic Diagrams of MobileGuard[™] Network Configuration

In addition to providing a means for establishing a local area network, the included router requires an activated SIM card from the appropriate wireless carrier in order to provide internet access.

While the router is configured at the factory to have the correct DHCP and firewall configuration, general instructions providing an example of how to set up the network using these devices are provided in the sections which follow. If you encounter any problems, please contact ABB Support (icos.support@ca.abb. com).

Figure 26 illustrates the MobileGuard[™] network configuration. Only the Surface Pro Tablet communicates with the internet through the firewall. The analyzer does not communicate with the internet, and all traffic to and from the analyzer is limited to the intranet.

...4 Network Communications Configuration

Connect and Power On Router

- 1 Connect the Cradlepoint router's power port to the supplied connector so that it receives power from the analyzer.
- 2 Use the provided Ethernet cable to plug the router into the Ethernet port on the rear of the analyzer.
- **3** Power on the analyzer.

Verify Router Settings

- 1 Connect the MobileGuard[™] tablet to the Cradlepoint router's SSID.
- 2 Open Google Chrome browser and go to 192.168.0.1.
- 3 Log in with the username *admin* and password shown on the bottom of the router.
- 4 Click **Dashboard** on the left panel.
- 5 Verify that the wireless modem is listed and connected as shown in Figure 27.

WARNING!

To maximize cybersecurity, users are advised to change all passwords from their default value.

cradlepoint				WiFi Clients: 0 IBR200 🕞
NetCloud os	∂ ⑦ >		Modem/LTE: 11 Internal 10M-VZ	Other Connections: None
G	🕰 Dashboard			Search
🕅 QUICK LINKS	Device Information			▲ Help
DA SHBOARD			_	
S CONNECTION MANAGER	1BR200-10M	MM190104701794	v7.0.30 (Mon Jan 28 20:22:13 UTC 2019)	
.ĄL. STATUS	0 days, 0 hours, 46 mins	00:30:44:3b:c3:59	670 14%	
	Not Managed	33 °C (HI/Lo: 33/22 °C)	Tue Nov 19 2019 20:22:21 GMT-	
	- Modems		<i>I</i>	
해 SYSTEM	▶ Internal 10M-VZ (SIM - Verizon)	No WWAN Devices Detected	-	
	Section LAN (clients: 1)	1	🗢 WiFi	0
	Primary LAN: 192.168.0.1 / 255.255.255.0		SSID: IBR200-359 - Radio 1	
	IPv6 Address: None Route Mode: NAT Access: Admin Access,DHCP		Channel: 6 Channel Contention: 3 % Transmit Power: 100%	
	Guest LAN: 192.168.10.1 / 255.255.255.0 IPv6 Address: None		Channel Locked: No Security: WPA2 Personal Network: Primary LAN	
	Route Mode: NAI Access: DHCP			
Copyright © Cradlepoint, Inc. 2018 All rights	reserved. Licenses			Privacy Policy Support www.cradlepoint.cor

Figure 27 Example of Correctly Configured Dashboard with an Operational Verizon Modem

...4 Network Communications Configuration

Verify Analyzer is Connected

1 Click **Networking** on the left panel.

- 2 Click Ethernet ports from the sub-menu.
- **3** Verify that the analyzer appears connected to 192.168.0.100 as shown in Figure 28.

	Reservations	
Local Networks	😌 Add 🧪 Edit 😣 Remove	
Wireless (WiFi) Settings	Hostname	IP Addr
Ethernet Ports	□ MEA	192.168.0.100



...4 Network Communications Configuration

Cradlepoint Deployment Guidelines

The Cradlepoint router comes from the factory preconfigured according to these guidelines. Users are advised not to change these settings and that doing so risks introducing cybersecurity vulnerabilities.

The MobileGuard™ software requires access to the following TCP ports on the intranet:

- 22: basic SSH commands to analyzer
- 445: SMB port (not currently used)
- 8082: Watchdog Websocket connection
- 20002: Websocket data stream from analyzer

The MobileGuard™ software requires access to the following TCP port on the internet:

• 443: HTTPS

Ensure that these ports are not blocked by any firewall software on the intranet or internet.

ABB, Inc. and its affiliates are not liable for damages and/ or losses related to security breaches, any unauthorized access, interference, intrusion, leakage and/or theft of data or information resulting from deviations from the default configuration.

Deny All Filter Policy

Under **Security** > **Filter Policies**, restrict all IPs not in LAN on all Ports for TCP/UDP Traffic as shown in Figure 29.



Figure 29 Configuring Firewall Filter Policies

Firewall Options

Under Security > Zone Firewall > Port Forwarding, configure port forwarding to the IP address of the Microsoft Survey (typically 192.168.0.10) for HTTPS on port 443 to Surface Pro Tablet IP. This information can be found under Local Networks > DHCP Server and listed as Active Leases. An example of the port forwarding configuration is shown in Figure 30.





All Remote Logins Restricted

- Remote Web Admin: DISABLED
- Remote SSH Access: DISABLED

Additional Settings

- IPV6: DISABLED
- Anti-Spoof: ENABLED
- Weak Cipher Support: DISABLED
- SMS support: DISABLED
- Guest AP: DISABLED
- MAC Logging: ENABLED
- WAN pings: DISABLED
- VPN: Disabled
- GRE Tunnels: None
- Network Mobility (NEMO) Settings: None (Licensable Feature)
 not licensed

5 System Configuration

Once the MobileGuard[™] system is installed, several additional steps must be taken to ensure the various components are properly mounted and configured.

Anemometer Orientation Check and Calibration

Newly installed anemometers require an orientation check and calibration before they can be used in the MobileGuard[™] system. The following sections assume the anemometer is properly mounted on a vehicle (as described in the "Roof Mast" section), and signal and power connections are made to the analyzer. It also requires all MobileGuard[™] system components be functional, including the local area network and 3G/4G internet connection.

Anemometer Orientation Test

This section describes how to check for proper orientation of the installed anemometer by collecting a short drive package and checking that the mean azimuthal angle for wind measurements is between 178 and 182 degrees.

- 1 Power on the MobileGuard[™] system and begin a drive package.
- 2 Drive for 5-10 minutes, preferably covering a range of directions and vehicle speeds (0-40 mph / 0-64 kph should be sufficient).
- **3** Stop the drive package collection.
- 4 When the drive package production is complete, open the PDF report contained in the *.drive* file and examine the *Mean Wind Azimuth* value reported in the *Measurement Statistics* section on the first page of the report (see Figure 31).

Measurement Statistics

	Min	Max	Mean
CH ₄ (ppm)	1.89	4.83	2.06
C ₂ H ₆ (ppm)	-0.18	0.66	0.10
Outside Temperature (°C)	10.13	21.63	12.39
Wind Speed (mph)	0.00	13.75	1.30
Car Speed (mph)	0.00	36.86	10.97
Wind Azimuth (deg)	121.44	191.59	180.52
Wind Elevation (deg)	-89.92	89.25	-6.26

Figure 31 Location of Mean Wind Azimuth Value on Report

5 If the reported mean azimuthal angle is between 178 and 182 degrees, the anemometer is properly aligned to the vehicle.

If the reported value is outside this range, rotate the anemometer slightly to bring it into better alignment with the vehicle: See Figure 21 and follow Steps 6 and 7, below.

If the mean azimuthal angle is too large (that is, greater than 182 degrees) rotate the anemometer slightly clockwise from the top. If the angle is too small (that is, less than 178 degrees) rotate the anemometer slightly counter-clockwise from the top.

- **6** To rotate the anemometer, use a flat-head screwdriver to loosen the stainless-steel hose clamp on the anemometer's base. The anemometer can now be rotated. Try to achieve the configuration shown in Figure 21.
- 7 Tighten the hose clamp on the anemometer's base to secure it to the vehicle mast and repeat Steps 1 5 to check the new alignment. Repeat this process until proper alignment is achieved.

Calibrate Anemometer for Higher Vehicle Speeds

If the MobileGuard[™] system is intended to be used at vehicle speeds in excess of 30 mph (50 kph), a set of calibration factors must be applied to account for perturbations to the wind measurements.

The following describes how to calibrate the anemometer for higher vehicle speeds.

1 In the MobileGuard™ UI from the sidebar, select General Settings > Vehicle Calibration Settings (see Figure 32).



Figure 32 Access Vehicle Calibration Settings

2 Set the Anemometer Calibration X, Y, and Z values to 0 (see Figure 32).

If values from a previous installation exist, it is recommended to record these values for your records.

- **3** Power on the MobileGuard[™] system and begin a drive package.
- 4 Drive for approximately 30-45 minutes covering a range of speeds (0-60 mph / 0-97 kph) and directions.
- 5 Stop the drive package collection.
- 6 When the drive package production is complete, email the drive package (the *.drive* file) to ABB Support and request an anemometer calibration.
- 7 ABB Support will process this data and send you Anemometer Calibration (X), (Y), and (Z) values. Enter these in the appropriate fields under General Settings > Vehicle Calibration Settings.

Configure Hemisphere R330 GNSS Receiver

The Hemisphere R330 GNSS receiver is installed in the top panel of the analyzer. The stock settings must be changed to work with the MobileGuard™ system. Change the receiver settings using the Up, Down, and Enter arrows, accessible on the analyzer top panel.

- Set the output baud rate: From the top menu, navigate to System Setup > Baud Rates, then set the value for PORT A to 19200.
- 2 Configure the GNSS output format:
 - **a** From the top menu, navigate to *Configure* > *Data PORT A*.
 - **b** Set GPRMC to **2 Hz**.
 - c Ensure all values other than GPRMC are set to Off.

Measure Sampling Delay Time

If your MobileGuard[™] inlet installation uses the entire 6.1 meter (20 foot) section of ³/₈ inch Teflon tubing provided by ABB, the sampling delay time (time it takes gas from the inlet to reach the analyzer) should be approximately 1500 ms, which is the default value entered into the MobileGuard[™] software. If the tubing length is modified, the sampling delay time must be remeasured and entered in the software. Currently, it is advised to contact ABB customer support for assistance with this process.

Optional Configuration

Configure Anemometer Output

This section describes how to access and configure the RMY81000 anemometer using Minicom, a serial terminal application which can be run on the analyzer.

<u> ∧ NOTE</u>

Configuring the anemometer output can be particularly challenging. It is recommended that ABB Support performs the configuration via a remote connection.

Configure Anemometer Output - Setup

- 1 Ensure that the analyzer and anemometer are powered on, and the anemometer serial cable is connected to the correct serial port on the analyzer.
- **2** Use Virtual Network Computing (VNC) to access the desktop of the analyzer.

Configure Anemometer Output - Install Minicom

1 Open a terminal window: Right-click on the desktop and select **Open Terminal Here**.



Figure 33 Select Open Terminal Here

2 Type the following command at the terminal prompt:

sudo apt-get install minicom

۶.,			ໂ	Termin	al - Igr@LGF	R-13-0204: ~/D	esktop
File	Edit	View	Terminal	Go	Help		
lgr@L	GR-13	-0204 :	~/Deskto	p\$ su	udo apt-g	et install	minicom

Figure 34 Command to Install Minicom

- 3 Enter the superuser password.
- 4 Confirm disk space installation: Type Y.

Configure Anemometer Output - Connect to Anemometer After Minicom is installed, perform the following to connect to the anemometer.

1 Type: minicom -s



Figure 35 Command – minicom -s

2 Choose Serial port setup.



3 Change *Serial Device* to */dev/ttyM6*: Type **A**, then modify the device string.

	Terminal - Ig	r@LGR-13-0204: ~/
e	cuit view reminal Go Heip	
Ì	A Carial Davies	(10) (10)
	A - Serial Device :	/dev/ttyusbu
	B - Lockfile Location :	/var/lock
	D Callout Program	
	E Pos/Par/Dits	20400 001
	E Hardware Elew Control	Vor
	G - Software Flow Control	No
	d - Software From control .	110
	Change which setting?	
	+	
	Save setup as dfl	
	Save setup as	i i
	Exit	- i -
	Exit from Minicom	- i -
	+	+

Figure 37 Modify Device String

4 Change *Speed* to 38400 8N1: Type **E**, then select **D** from the *Speed* menu.

	Terminal - Igr@LGI	k-13-0204/Deskto	ip.
ile Edit View Terminal	Go Help		
		Parameters	
I A - Serial Del	[com	rarameters]	
B - Lockfile Loci	Current:	38400 8N1	
C - Callin Pro	Speed	Parity	Data
D - Callout Pro	A: <next></next>	L: None	S: 5
E Bps/Par/B	B: <prev></prev>	M: Even	T: 6
F - Hardware Flo	C: 9600	N: Odd	U: 7
G - Software Flo	D: 38400	O: Mark	V: 8
1	E: 115200	P: Space	
Change which			
+	Stopbits		
Screen a	W: 1	Q: 8-N-1	
Save set	X: 2	R: 7-E-1	
Save set			
Exit			-
Exit fro	Choice, or <e< td=""><td>nter> to exit?</td><td></td></e<>	nter> to exit?	
++			

Figure 38 Change Speed

- 5 Turn off Hardware Flow Control: Type F.
- 6 Select Exit to exit configuration and begin displaying data.

Data streaming from the anemometer should appear in the following form:

S.SS DDD.D E.E NNN.NN TT.TT

Where S is wind speed, D is direction, E is elevation, N is speed of sound, and T is temperature.

- 7 Press Ctrl-A, then type z.
- 8 Type A to select the Add linefeed option.

Terminal - Igr@LGR-13-0204: ~/Desktop	- • ×
File Edit View Terminal Go Help	
1.05 332.4 -1.3 348.68 28.56	
0+	+
0 Minicom Command Summary	1
0	
0 Commands can be called by CTRL-A <key></key>	
0	
0 Main Functions Other Functions	
0	
0 Dialing directoryD run script (Go)G Clear Screen	C
0 Send filesS <u>Receive filesR</u> cOnfigure Minico	m0
0 comm ParametersP Add linefeedA Suspend minicom.	J
0 Capture on/offL nangupn eXit and reset	X
0 send breakF initialize ModemM Quit with no res	et.Q
0 Terminal settingsT run KermitK Cursor key mode.	I
0 lineWrap on/offW local Echo on/offE Help screen	Z
0 Paste fileY scroll Back	B
0	
0 Select function or press Enter for none.	
0	1
0 Written by Miquel van Smoorenburg 1991-1995	1
0 Some additions by Jukka Lahtinen 1997-2000	
0 i18n by Arnaldo Carvalho de Melo 1998	
1+	+
CTRL-A Z for help 38400 8N1 NOR Minicom 2.5 VT102	Offline

Figure 39 Select Add linefeed Option

9 Press Enter to exit.

Configure Anemometer Output - Configure Anemometer to Output at 2 Hz

1 Press **Esc** three times, in rapid succession, to bring up the *Configuration* menu.

COMMANDS (VERSION 7.1.02) R) REPORT S) SETUP X) EXIT TO OPERATE MODE

Figure 40 Configuration Menu

- 2 Select S.
- 3 Select A from the Set Parameters screen.



Figure 41 Select Averaging from Set Parameters

4 Set the averages to 2, then press Enter.

NUM OF SAMP TO AVG: 2 ENTER NEW NUM OF SAMP TO AVG (0 TO 320): 2

Figure 42 Set Averages

- 5 Select O from the Set Parameters screen.
- 6 Select A to set the output rate to 4 Hz (which is then averaged twice to yield a 2 Hz data stream).

OUT	۲fly	ΓR/	ATE	=	4	Hz	 _
A)	4	ΗZ					
в)	С	ΗZ					
C)	8	ΗZ					
D)	10	ΗZ					
E)	16	ΗZ					
F)	20	ΗZ					
G)	32	ΗZ					
X)	EX3	Т					

Figure 43 Set Output Rate

7 Press X three times to return to Operation mode.

Configure Anemometer Output - Exit Minicom 1 Press Ctrl-A, then Z.

2 Type X and confirm exit from Minicom.

Configure Anemometer Output - Troubleshooting

- Problem: No text readout
- The serial port specified during the Minicom setup is incorrect.
- The anemometer is not powered.
- The serial cable is not connected.
- Problem: Text is garbled
- The baud rate is incorrect. The default rate is 38400, but commonly used options are 9600 and 19200.
- The serial port specified during the Minicom setup is incorrect.
- Problem: 3-Esc sequence produces no result
- Exit and restart Minicom.

Remote Access to Vehicle Computer

The MobileGuard Quick Support Module is installed by the factory on the Microsoft Survey provided with the system, but can also be downloaded at the following link: https://get.teamviewer.com/6gat44s or by contacting

ABB Support (icos.support@ca.abb.com). This installer will automatically link the *MobileGuard Quick Support Module* application to ABB's service account, which provides secure audit logs of all activity associated with the linked computer. This linking does **NOT** allow unattended access to the linked computer.

To launch the *MobileGuard Quick Support Module*, execute the TeamViewerQS.exe, then follow the prompts after which the screen below appears.



To allow a remote connection, users must click to allow the connection when the ABB support team attempts to connect. The ID of the machine will be known to the ABB support team, but you may be required to indicate which computer requires support, as well as verify the identity of the user/organization requesting support.

To request help, contact ABB Support (icos.support@ca.abb.com). This will notify our support team that help is needed, and they will contact you in a timely manner.

6 Using the System

Hardware Pre-Drive Inspection

- Check the roof rack for loose connections and damage.
- Check that the anemometer is securely attached.
- Check that the anemometer is aligned with the vehicle driving direction to within approximately one degree (the black junction box towards front of the vehicle).
- Check that the inlet is securely attached to the bumper.
- Inspect the inlet for damage.
- Inspect the inlet for obstructions.
- Check that all connections to the back of the analyzer are securely attached.
- Check that the water-dropout trap is empty and free of particulate. If not, refer to "Water-Dropout Trap" for instructions on emptying the water-dropout trap.

System Power On

- 1 Ensure that the analyzer power switch is OFF.
- 2 Start the vehicle.

\land IMPORTANT!

Do not start the vehicle while the analyzer is running. Although the analyzer can run directly off the battery, the voltage drops which occur when starting the vehicle reboot components in the analyzer.

3 Connect both 11.5-15 V DC power cables (see Figure 45).



Figure 45 One of the Two 11.5-15 V DC Power Connections

- **4** Power on the analyzer by flipping the switch on the front of the analyzer to ON.
- 5 Ensure that the GNSS antenna has a clear view to open sky and that the GNSS receiver has illuminated the green light (on the top panel of the analyzer).

Software Startup

- For details on accessing the UI, refer to the ABB ICOS FastScanner™ Software User Manual.
- For details on conducting a test drive package, refer to the ABB ICOS FastScanner™ Software User Manual.

Standard Operation

For details on standard operation, refer to the ABB ICOS FastScanner™ Software User Manual.

Report Generation

For details on report generation, refer to the ABB ICOS FastScanner™ Software User Manual.

Data Storage

For details on data storage, refer to the ABB ICOS FastScanner™ Software User Manual.

System Shutdown

- Ensure that no drive is currently active in the MobileGuard[™] software.
- 2 Click the **On/Off** icon, then select **Shutdown** (see Figure 46).

0	%	₿	<u>ب</u>	
-	Reb	oot		
	Shu	tdown		

Figure 46 Shutdown

- 3 Wait 30 seconds for the analyzer computer to shut down.
- 4 Power off the analyzer: Flip the switch on the front to OFF.
- **5** Copy any drive packages for reports or sharing from the laptop.
- 6 Shut down the laptop.
- 7 Disconnect the 11.5-15 V DC analyzer power plugs (see Figure 45).
- 8 Turn off the vehicle.

\land IMPORTANT!

Always ensure that the system is disconnected from the vehicle battery when not in use – small current draws from the analyzer over days drains the battery.

7 System Maintenance

Monthly Maintenance

Synchronize Survey Clock with Windows Server

Re-synchronize the computer Windows clock with the time.windows.com NTP server: While connected to the Internet, access the Windows date and time settings; then toggle the *Set time automatically* switch **Off**, then **On**. (See Figure 47.)



Figure 47 Synchronizing Windows Clock

Quarterly Maintenance

Clean Battery Power Cable Contacts

Carefully disconnect all points at which the battery cables are connected to the battery and chassis, starting with the (+) terminal on the vehicle battery. Clean contact locations with a wire brush or sandpaper, then re-attach the battery cables to the appropriate contact points (make the (+) connection to the battery the final connection). Double-check that the cable lugs are securely fastened.

Clean Google Drive Repository

Google Drive connection issues may occur if too many files are present in the repository. This is particularly applicable to users with fleets of vehicles depositing data to a single repository. On occasion, it may be necessary to back up older data to another source and delete this data from the Google Drive repository: Be very careful because this may result in lost data.

Clean 75 µm Filter

Refer to the instructions in the "Cleaning the 75 μm Filter" section.

Yearly Maintenance

Analyzer Inspection

- Methane and ethane concentration validation check
- Optical cavity health check (ringdown times)

Pump Diaphragm Replacement

- Contact ABB Technical Support.
- Required tools and equipment: 4 pump diaphragm replacement kits (ABB part number 019-0020-9000-0000).

Inlet Filter Replacements

It is recommended to service/replace the external 75 μm and 2 μm filters on the MobileGuardTM system on a yearly basis: Refer to "Inlet In-Line Filter Maintenance".

Incidental Maintenance

Water-Dropout Trap

If water is present in the water-dropout trap, perform the following:

- 1 Power off the analyzer.
- **2** Unscrew the water-dropout filter from the water-dropout-trap filter assembly (see Figure 48).

Water-Dropout Filter



Figure 48 Water-Dropout Filter

- **3** Empty the filter. It may be necessary to use compressed air or a brief soak in water to remove debris that has accumulated on the filter.
- **4** Screw the dry filter back onto the water-dropout-trap filter assembly.

...7 System Maintenance

Inlet In-Line Filter Maintenance

Overview

The MobileGuardTM inlet system has two external in-line filters (75 μ m and 2 μ m) that should be cleaned or replaced once per year, or sooner if they become clogged by debris. A significant clog in one of the filters is often indicated by software alarms for reduced pressure and/or reduced flow rate.

The 75 μm filter may be cleaned or replaced, however, the 2 μm filter must be replaced.

Cleaning the 75 µm Filter **Required Tools**

- Two crescent wrenches
- Canister of compressed air
- Flashlight (optional)

Procedure

 Using the two crescent wrenches, loosen, then remove, the ³/₈ inch Swagelok nut connecting the Teflon tubing to the inlet manifold (see Figure 49).

▲ IMPORTANT!

Do not disconnect the housing from the swage connection!



Figure 49 Remove Swagelok Nut from Inlet Manifold

2 Blow compressed air both ways through the section of the manifold that houses the 75 μm screen filter, as shown in Figure 50. This should remove any debris that has built up on this filter.



Figure 50 Blow Compressed Air Through Inlet Manifold

3 Inspect the screen filter for any remaining debris. Shining a flashlight through one end of the inlet (see Figure 51) aids in this process.



Figure 51 Use Flashlight to Confirm Filter Free of Debris

- 4 If there is still debris on the screen filter, repeat Steps 2 and
 3. If this does not remove all remaining debris, run water
 through the screen filter, then ensure the assembly is dry
 before proceeding.
- **5** Re-attach, then tighten, the Swagelok nut that connects the Teflon tubing to the inlet manifold. Be very careful not to over-tighten this connection.

...7 System Maintenance

Replacing the 75 μm Filter

- **Required Tools and Equipment**
- 75 μm filter assembly (ABB part number SPA-MG-75UM-INFLT)
- Two crescent wrenches
- Flat-head screwdriver (if needed)

Procedure

- Using the two crescent wrenches, loosen, then remove, the ³/₈ inch Swagelok nut connecting the Teflon tubing to the inlet manifold (see Figure 49).
- 2 Remove the filter assembly from the vehicle:
 - a If the assembly is attached to the vehicle by screws, use a flat-head screwdriver to remove the screws (see Figure 52).
 - **b** Detach the assembly from the vehicle (attached by Velcro).



Figure 52 Remove 75 µm Filter Assembly

- 3 Discard the used filter assembly.
- 4 Attach the new filter assembly to the vehicle:
 - a Remove the tape from the two Velcro sections on the filter assembly, then use the Velcro to secure the assembly to the vehicle.
 - **b** If the assembly is attached to the vehicle by screws, use a flat-head screwdriver to attach the screws that secure the assembly to the vehicle.
- **5** Re-attach, then tighten, the Swagelok nut that connects the Teflon tubing to the inlet manifold. Be very careful not to over-tighten this connection.

Replacing the 2 μm Filter Required Tools and Equipment

- Two crescent wrenches
- 2 μm filter assembly (ABB part number SPA-MG-2UM-INFLT)

Procedure

 Using the two crescent wrenches, carefully loosen the two Swagelok nuts on the assembly attached to the rear panel of the analyzer, as shown in Figure 53. Do NOT break any of the NPT connections that are sealed with Teflon tape.



Figure 53 Loosen Swagelok Nuts

- ${\bf 2}~$ Remove the used 2 μm filter assembly and replace it with the new one.
- 3 Re-tighten the two Swagelok nuts on the new filter assembly: DO NOT OVER-TIGHTEN THE NUTS.

....7 System Maintenance

System Decommissioning

At the system's end of service, it is important to securely decommission the supplied Microsoft Surface Pro tablet so that user data is not compromised after disposal. This can be accomplished by using the Microsoft Surface Data Eraser tool. This tool and instructions for use can be found at:

https://docs.microsoft.com/en-us/surface/microsoft-surface-data-eraser

8 Appendices

Acronyms

- AGM Absorbent Glass Mat
- GNSS Global Navigation Satellite System
- MEA Methane/Ethane Analyzer
- NEMO Network Mobility
- SIM Subscriber Identity Module
- UI User Interface
- VNC Virtual Network Computing

Troubleshooting

Troubleshooting Tips

Contact ABB Support with any questions – we're here to help! Refer to "Customer Support" for contact information.

Table 1	Troub	les	hoo	ting
---------	-------	-----	-----	------

Problem	Cause	Corrective Action
No internet	3G/4G not available	Drive to another location.
connection	Modem failure	Unplug and re-plug modem USB connection.
No data stream from analyzer	No active drive	Exit and restart UI, then start a drive package.
	Network configuration corrupted	Restart laptop, analyzer, and router.
Gray status indicator light	One or more devices not connected	Use the gray status indicator light to identify problematic component, then check power/connections for that component. If problematic component is GNSS, check to ensure present location does not have obstruction for GNSS antenna (eg, vehicle is under an overpass).
	GNSS antenna is obstructed	Drive to a new location where the antenna on the roof of the vehicle has a clear view of the sky.
Gray GNSS status indicator light	Poor GNSS antenna cable connection	Inspect the cable connecting the GNSS antenna to the rear panel of the analyzer. If this looks good, disconnect, then reconnect, the TNC connections at both ends of this cable.
		Close the UI, then restart the
UI is unresponsive	Front-end crash	MobileGuard [™] software. If problem persists, reboot laptop and restart software.
Methane, ethane, or water readings are non-physical	Loss of laser lock	Contact ABB Support for instructions.
Pressure alarm	Significant change to inlet pressure	This may occur if the vehicle has been moved to higher altitudes. Contact ABB Support for instructions.
	Clog in inlet system	This will likely be coupled with a Flow alarm. Ensure inlet system is not obstructed and clean/replace inlet filters.
Flow alarm	Clog in inlet system	Ensure inlet system is not obstructed and clean/replace inlet filters.
Temperature alarm	Analyzer temperature is below 0 °C (32 °F) or above 50 °C (122 °F)	Ensure nothing is obstructing fans or exhaust openings on analyzer case. Bring vehicle cabin into appropriate temperature range and leave analyzer on with fans running for 15 minutes before attempting to start another drive package.
Ringdown alarm	Analyzer mirrors are dirty	Contact ABB Support for instructions.
	Laser alignment	Contact ABB Support for instructions.
Maps are missing from PDF report	Poor internet connectivity	Reprocess drive package when a better internet connection is established.

...8 Appendices

Dealing with Automatic Updates

Both the Windows OS and Chrome are configured to automatically update. In most cases, these updates will cause no issues for the MobileGuard[™] software. Do not interrupt or delay the updating process except as a part of a troubleshooting process and when instructed by ABB Service Engineers.

Prevent Chrome from auto-updating as follows:

- 1 Type **Run** in the Windows search box.
- 2 Select the Run command.
- 3 Type msconfig.
- 4 Click **OK** or press **Enter**: The *System Configuration* window opens.
- 5 Select the Services tab.
- 6 At the bottom of the window, uncheck the box to the left of *Hide all Microsoft services*.
- 7 Navigate the list of services and uncheck the Google Update (gupdate) and Google Update (gupdatem) boxes.

	General Boot Services Startup Tools	
ncheck Boxes	Service Manufacturer Status Date Disables ✓ Windows Font Cache Service Microsoft Corporation Running ✓ Windows Font Cache Service Microsoft Corporation Running ✓ Windows Cemera Frame Service Google Corporation Running ✓ Windows Cemera Frame Service Google LLC Stopped ✓ Group Policy Client Microsoft Corporation Stopped ✓ Group Policy Client Microsoft Corporation Stopped ✓ Google Update Service (gupdate) Google Inc. Stopped ✓ Google Update Service (gupdate) Google Inc. Stopped ✓ Human Interface Device Service Microsoft Corporation Running ✓ Modeoup Listner Microsoft Corporation Running ✓ Modeoup Listner Microsoft Corporation Running ✓ HomeGroup Provider Microsoft Corporation Stopped ✓ HomeGroup Distormer Microsoft Corporation Stopped ✓ HomeGroup Services Microsoft Corporation Stopped ✓ HomeGroup Services Microsoft Corporation Stopped ✓ HomeGroup Services Micr	able all

Figure 54 Prevent Automatic Updating

- 8 Click Apply, then OK to save the changes.
- **9** When prompted to restart the PC, click **Restart** for changes to take effect.

...8 Appendices

Kits, Accessories, and Service Items

Table 2 lists MobileGuard™ kits, accessories, and service items.

Table 2 MobileGuard[™] Kits, Accessories, and Service Items

Part Number	Description	Notes
019-0020-9000-0000	Pump Rebuilt Kit, for PU3990	Part of MTN-232-1Y (1-Year Maintenance Kit - GLA232 Series - DC Rackmount Analyzers). May also be purchased separately.
099-0271-0000-0000	MobileGuard™ Chassis Fastener Kit	Optional.
0232-13-0-00001-01	Verizon™ Cradlepoint WiFi Kit	
0232-13-0-00001-02	AT&T™/Gen. Cradlepoint WiFi Kit	
0232-13-0-00001-03	Sprint™ Cradlepoint WiFi Kit	
0232-13-0-00001-04	Europe Cradlepoint WiFi Kit	
0232-13-0-00001-05	Asia Pacific Cradlepoint WiFi Kit	
917-0075-1000-0000	GLA232 CH₄/C₂H₅ Analyzer (MEA)	Provided with MobileGuard [™] system.
917-9001-0000-0000	MobileGuard™ 3D Sonic Anemometer Kit	Provided with MobileGuard [™] system.
917-9002-0000-0000	MobileGuard [™] Microsoft SFC Pro Field Kit	Provided with MobileGuard [™] system.
917-9003-0000-0000	MobileGuard [™] Cradlepoint WiFi Kit	Provided with MobileGuard [™] system.
917-9004-0048-0000	MobileGuard™ 48 inch Roof Mast	Optional - applies if 48 inch roof mast chosen.
917-9004-0058-0000	MobileGuard™ 58 inch Roof Mast	Optional - applies if 58 inch roof mast chosen.
917-9012-0000-0000	MobileGuard [™] 2D Sonic Anemometer Kit, China	Provided with MobileGuard [™] system: China applications only.
MTN-232-1Y	1-Year Maintenance Kit - GLA232 Series - DC Rackmount Analyzers (MobileGuard™) - Internal Pump	Optional. Recommended preventive maintenance kit. Includes : • Rebuild Kit for Internal Pump • 2 μm filter assembly • 75 μm filter assembly
SP-GNSS-ANT	GNSS Antenna - GPS/GLONASS	Provided with MobileGuard [™] system.
SPA-MG-2UM-INFLT	MobileGuard™ 2 um Inlet Filter Replacement Kit	Provided with MobileGuard [™] system.
SPA-MG-75UM-INFLT	MobileGuard™ 75 um Inlet Filter Replacement Kit	
SPA-TABLET	Tablet with XGuard Software	Customer must provide analyzer serial number.
SPK-MG-INLET	MobileGuard™ Inlet Kit	Country of use must be specified upon placing order. Includes: Inlet head with 75 µm filter assembly 25 ft Teflon tubing with fittings Double-faced tape (to fix inlet head) Bumper screws (to fix inlet head)
SPK-MG-INSTALL	MobileGuard™ Installation Kit	 Bumper screws (to fix met nead) Provided with MobileGuard[™] system. Includes all cables, fuses, and installation hardware.

...8 Appendices

Packaging and Shipping the Analyzer

- 1 Obtain and print an RMA form from ABB (email icos.support@ca.abb.com).
- 2~ Except for the Instrument Power and Pump Power connections, disconnect all connections from the rear panel of the analyzer, including the water trap and 2 μm filter assembly.



Figure 55 Disconnect Rear Panel Connections

- **3** Detach the router from the top panel: The router is secured with 3M Dual Lock reclosable fastener tape.
- 4 Attach a 3/8 inch Swagelok cap to the inlet.



Figure 56 Attach Swagelok Cap

5 Remove the rack-mount adapters.



Figure 57 Remove Rack-Mount Adapters

6 Carefully place the analyzer in the plastic bag, then tape the bag shut to protect the analyzer from dust and other particulate matter during shipping.

- 7 The Styrofoam packaging material may be notched in specific places to account for the protruding handle and other plumbing on the back panel of the analyzer. Place the appropriate half of the Styrofoam insert into the bottom of the box.
- 8 Place the analyzer in the box.
- 9 Place the top Styrofoam insert into the box.
- **10** Tape the box shut using packing tape. It is advised to tape along all three edges of the top flaps on the box.
- 11 Tape the RMA form to the outside of the box.

12 Ship to:

ABB Inc. Measurement & Analytics 3400, rue Pierre-Ardouin Quebec, (Quebec) G1P 0B2 Canada ABB Inc.

Measurement & Analytics

3400, Rue Pierre-Ardouin Québec (Québec) G1P 0B2 Canada Tel: +1 800 858-3847 (North America) Tel: +1 418 877-2944 (other countries) Fax: +1 418 877-2834

abb.com/measurement

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