



Vodafone MachineLink 3G Plus

Quick Start Guide
and Safety Manual

Vodafone
Power to you



Welcome

to the world of mobile communications

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Welcome

Thank you for choosing a **Vodafone MachineLink 3G Plus**, M2M IP router. This guide will help you set up, connect and configure your device quickly and easily.



Package contents

This package includes

- 1x Vodafone MachineLink 3G Plus router
- 2x 3G antennas
- 1x 1.5m yellow Ethernet cable 8P8C
- 1x DIN rail mounting bracket
- 1x Six-way terminal block
- 1x Quick start guide and safety manual

Device overview



ITEM	DESCRIPTION
1	Aux antenna socket SMA female connector for auxiliary antenna (receive diversity).
2	Mini USB 2.0 OTG port Provides connectivity for optional external storage, USB to Serial port adapter or USB Ethernet dongle. Supplies up to 0.5A to connected device.
3	GPS antenna socket SMA female connector for GPS antenna.
4	Serial port Female DB9 port supporting 9-wire RS-232, RS-485 or RS-422 (software selectable).
5	Main antenna socket SMA female connector for main antenna.



ITEM	DESCRIPTION
6 RJ45 Ethernet port	Connect one or several devices via a network switch here.
7 Reset button	<ul style="list-style-type: none"> • Press and hold for less than 5 seconds to reboot to normal mode. • Press and hold for 5 to 15 seconds to reboot to recovery mode. • Press and hold for 15 to 20 seconds to reset the router to factory default settings.
8 Six-way terminal block connector	Connect power source, ignition and I/O wires here. Power, ignition and I/O wires may be terminated on the supplied terminal block and connected to a power source. Refer to the diagram and table under Step 4 of the Installing your device section for correct wiring of the terminal block. Operates in the 8-40V DC range.
9 SIM card slot	Insert SIM card here (if not included).

Getting started

Depending on your individual setup, you may need certain components to configure your device correctly.

- External power supply unit for the **Vodafone MachineLink 3G Plus** (not included).
- Flathead screwdriver for terminating power input wires.
- Notebook or PC for advanced configuration.
- Additional fasteners and screwdrivers for specific wall or rail mounting.

Mounting options

The **Vodafone MachineLink 3G Plus** can be installed quickly and easily in a variety of locations.

MOUNT TYPE	DESCRIPTION	BENEFITS
Wall mount	1. Flat against the wall	<ul style="list-style-type: none">• Slimline form factor, close to wall
	2. Perpendicular to the wall	<ul style="list-style-type: none">• Small wall footprint
	3. Mounted via DIN rail bracket	<ul style="list-style-type: none">• Easy to remove
C Section DIN rail mount	Slide onto a rail	<ul style="list-style-type: none">• Simplicity
Top hat DIN rail mount	Mount on a bracket and slide onto a rail	<ul style="list-style-type: none">• Simplicity• Can mount in between other devices
Desk mount	Stand on a desk	<ul style="list-style-type: none">• Simplicity, versatility

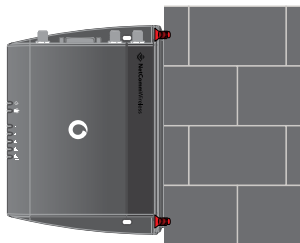
* Please remove the protective film from the top of the device after it has been mounted.

Wall mount

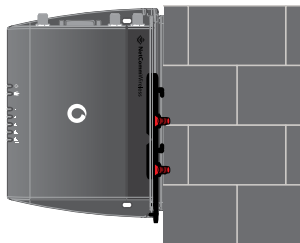
1. Flat against the wall



2. Perpendicular to the wall

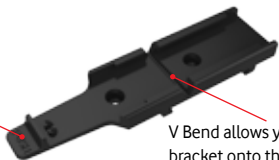


3. Mounted via DIN Rail Bracket



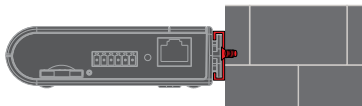
DIN Rail mounting bracket

Push to release

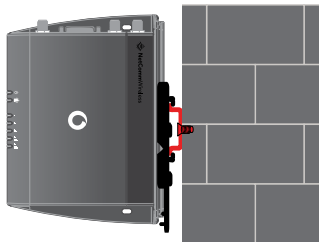


V Bend allows you to snap the DIN bracket onto the middle of a DIN rail, rather than sliding it onto the end

C Section DIN rail mount



Top hat DIN rail mount



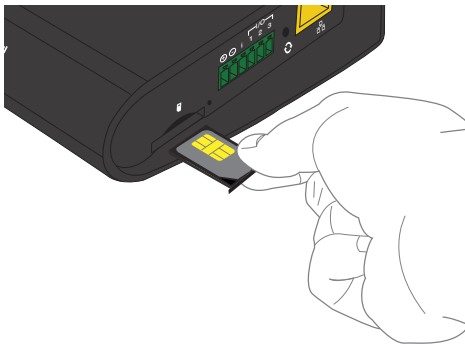
Desk mount



Installing your device

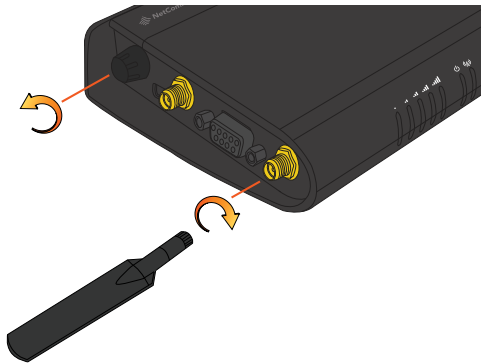
Step 1

If your router does not come with a SIM pre-installed, insert a SIM card into the SIM card slot by pressing the SIM Eject button to eject the SIM card tray. Place the SIM card in the tray and then insert the loaded tray into the SIM slot with the gold side facing up, as shown below.



Step 2

The MachineLink 3G Plus router is shipped with caps on the Main, Auxiliary and GPS antenna sockets. To attach the supplied antennas, first remove the antenna socket caps from the Main and Auxiliary antenna sockets by turning them in an anti-clockwise direction, then screw the antennas onto the sockets by turning them in a clockwise direction. Please refer to the [Device overview](#) section for the antenna socket layout. If you have purchased a GPS antenna, remove the socket cap from the GPS antenna socket and attach the antenna to the socket in the same manner.



Step 3

Mount your router in a suitable location using the options listed in the Mounting options section of this guide.

When selecting a location to mount the MachineLink 3G Plus router, keep in mind that it features two high performance antennas designed to provide optimum signal strength in a wide range of environments. If you find the signal strength is weak, try moving the router to a different place, mounting it differently or changing the orientation of the antennas.

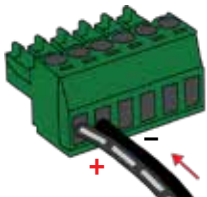
The signal strength LEDs update within a few seconds with a rolling average signal strength reading. When selecting a location for the router, please allow up to 20 seconds for the signal strength LEDs to update before repositioning.

Step 4

Connect power to your router using one of two options.

1 DC power via 6-pin connector

If you have purchased an optional DC power supply, first remove the terminal block from the connector. The terminal block connector uses rising cage clamps to secure the wires and ships with the cages lowered and ready for wire insertion. Inspect the cage clamps and use a flathead screwdriver to lower the cage clamps if they have moved during transportation. Insert the wires into the terminal block as shown below, noting the polarity of the wires, then use a flathead screwdriver to raise the cage clamp to secure the wires in the terminal block. Insert the wired terminal block into the terminal block connector of the router and then connect the adapter to a wall socket.



2 DC power via field terminated power source

If an 8-40V DC power supply is available, you can insert the wires into the supplied terminal block to power your router. Use a flathead screwdriver to tighten the terminal block screws and secure the power wires, making sure that you have correctly wired the terminal block as illustrated below.



TERMINAL	DESCRIPTION
+	Positive wire for power
-	Ground Wire
i	Dedicated terminal for ignition detection
I/O	Three terminals used for input/output detection (Please refer to the User Guide and SDK Guide for more information).

The green power LED on the router lights up when a power source is connected.

Step 5




















Connect equipment that requires network access to the Ethernet port of your router. You can connect one device directly, or several devices using a network switch.

Switch on your power supply and wait 2 minutes for your **Vodafone MachineLink 3G Plus** to start up and connect to the mobile network. Your router comes with preconfigured settings that should suit most customers.

Your router is now connected.

To check the status of your router, compare the LED indicators on the device with those listed opposite.

Overview of LED indicators

LED ICON	LED	COLOUR	STATE	DESCRIPTION
	Power		Off	Power off
			Double flash	Powering up
			On	Power on
			On	Power on in recovery mode
			Slow flashing	Hardware error
	Network		On	Connected via WWAN
			Blinking ¹	Traffic via WWAN
			Slow flashing	Connecting PDP
			On	Registered network
			Slow flashing	Registering network
			Slow flashing	SIM PIN locked
			Fast flashing	SIM PUK locked
			On	Can't connect
	Mobile signal strength		On	3G
			On	2G GPRS
			On	GSM only (no GPRS)

¹ The term "blinking" means that the LED may pulse, with the intervals that the LED is on and off not being equal. The term "flashing" means that the LED turns on and off at equal intervals.

Advanced configuration and troubleshooting

Depending on what you're using your router for, you may need to log into it via the web based configuration interface for status monitoring, troubleshooting or advanced configuration.

To access this interface you'll need a computer with Ethernet port and web browser (such as IE, Chrome, Firefox or Safari) installed.

Step 1

Make sure your Vodafone MachineLink 3G Plus is turned on and disconnect any Ethernet connections.

Step 2

Attach the supplied yellow Ethernet cable 8P8C to the LAN Ethernet port on your router and the other to your computer. Then access the user interface by entering <http://192.168.1.1/> into your web browser, enter your username and password and click **Log in**.

There are two system management accounts (Root Manager and Admin) with different management capabilities.

Root Manager account

Grants full privileges such as firmware upgrades, device configuration, backup and restore, and reset to factory default settings. To access the Root Manager account, use these login details.

<http://192.168.1.1>

Username:	root
Password:	admin

Admin account

Allows updates to general settings. To access the Admin account, use these login details.

<http://192.168.1.1>

Username:	admin
Password:	admin

Step 3

Once logged in you'll see the Status page. Here you can see an overview of information about the network your router is connected to (if any), signal strength and data connection status. You can access advanced configuration settings from the top menu.

For more information on advanced configuration, refer to the full product User Guide available from the [Help](#) link in the web configuration interface or from the NetComm Wireless website at <http://vodafone.netcommwireless.com>

Step 4

If the inserted SIM card is PIN locked, a pop-up window is displayed informing you that you must unlock the SIM before use.



Click the **OK** button. The SIM Security page is displayed.

PIN settings


In the **Current PIN** field, enter the SIM PIN and then enter it again in the **Confirm current PIN** field. If you do not want to enter the PIN code each time the SIM is inserted, select the **Remember PIN** option. Click the **Save** button. After a moment, the router displays “Success! The SIM unlock was successful”.

Step 5

If the SIM Status is OK, the MachineLink 3G Plus automatically attempts to connect to the Internet by detecting the correct APN and connection details.

If automatic configuration was unsuccessful, you must manually enter the connection details.

To manually configure the connection profile:

1. From the top menu bar, select the **Networking** option.
2. Next to **Profile1**, click the  button. The Data connection profile settings screen is displayed.
3. Ensure that the **Automatic APN selection** toggle key is set to the OFF position. (Not required when using a Vodafone GDSP SIM).

Automatic APN selection

OFF

4. In the **APN** field, enter the APN name used for mobile broadband connection. If required, enter the Username and Password in the Username and Password fields. Click the **Save** button.

The connection profile is now configured.

Verifying the connection status

Click on the **Status** menu item from the top menu bar. The Status page is displayed. The mobile broadband connection is established successfully if the **Status** field in the **Packet data connection status** section displays **Connected**.



The screenshot shows a mobile interface for 'Packet data connection status'. It lists various connection parameters in a table-like format.

- Packet data connection status		
Profile name		
Profile1		
Name	WVSUR IP	APN
Connected	10.06.08.218	Etanb
Default profile	DNS server	Connection timeout
Yes	62.540.130.233	00:29:42
	62.540.140.251	

Configuring multiple devices

To apply your advanced configuration settings to more than one Vodafone MachineLink 3G Plus router, follow these simple steps:

Step 1

Back up your router's configuration

Log in to the web configuration interface, click on the **System** menu, select **System configuration** and click on **Settings backup and restore**.

If you want to password protect your backup configuration files, enter your password in the fields under **Save a copy of current settings** and click on **Save**. If you don't want to password protect your files, just click on **Save**. The router will then prompt you to select a location to save the settings file.

The screenshot shows the web configuration interface of a Vodafone MachineLink 3G Plus router. The top navigation bar includes 'Home', 'Networking', 'Services', 'System', and 'Help'. The 'System' menu is expanded, showing options like 'Log', 'Ping watchdog', 'System configuration', 'Settings backup and restore', 'Update', 'Software applications manager', 'Administration', and 'Reboot'. The 'Settings backup and restore' option is highlighted. A red box highlights the 'Save a copy of current settings' form, which contains two password input fields labeled 'Password' and 'Confirm password', and a 'Save' button. Below this, there is a 'Restore saved settings' section with a 'Choose a file' button and a 'Restore' button. At the bottom, there is a 'Restore factory defaults' section with a 'Restore defaults' button.

Do not change the file extension of the backup file as this may cause it to corrupt.

Step 2

Restore your backup configuration

In the web configuration interface click on the **System** menu, select **System configuration** and click on **Settings backup and restore**.

From the **Restore saved settings** section, click on **Browse / Choose a file** and select the backed up configuration file on your computer.

Click **Restore** to copy the settings to the new Vodafone MachineLink 3G Plus router. The router will apply these settings and inform you it will reboot - click on **OK**.

The screenshot displays the web configuration interface for a Vodafone MachineLink 3G Plus router. The interface features a red navigation bar at the top with tabs for 'Status', 'Networking', 'Services', 'System', and 'Help'. A left-hand sidebar contains a menu with options: 'Log', 'Ping watchdog', 'System configuration', 'Settings backup and restore' (highlighted in red), 'Upgrade', 'Software applications manager', 'Administration', and 'Reboot'. The main content area is divided into three sections: 1. 'Save a copy of current settings' with fields for 'Password' and 'Confirm password', and a 'Save' button. 2. 'Restore saved settings' (highlighted with a red box), which includes a 'Browse' button labeled 'Choose a file' and a 'Restore' button. 3. 'Restore factory defaults' with a 'Restore defaults' button.

Safety and Product Care

Vodafone MachineLink 3G Plus

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RF exposure

Your device contains a transmitter and a receiver. When it is on, it receives and transmits RF energy. When you communicate with your device, the system handling your connection controls the power level at which your device transmits.

This device meets the government's requirements for exposure to radio waves.

This device is designed and manufactured not to exceed the emission limits for exposure to radio frequency (RF) energy set by the Federal Communications Commission of the U.S. Government.

This device complies with FCC radiation exposure limits set forth for an uncontrolled environment. To ensure compliance with RF exposure guidelines the device must be used with a minimum of 20cm separation from the body. Failure to observe these instructions could result in your RF exposure exceeding the relevant guideline limits.

External antenna

Any optional external antenna used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operated in conjunction with any other antenna or transmitter. Please consult the health and safety guide of the chosen antenna for specific body separation guidelines as a greater distance of separation may be required for high-gain antennas.

Any external antenna gain must meet RF exposure and maximum radiated output power limits of the applicable rule section. The maximum antenna gain for this device as reported to the FCC is: 0.2 dBi (850MHz) and 2.7 dBi (1900MHz).

CE approval (European Union)

This device has been tested to and conforms to the regulatory requirements of the European Union and attained CE Marking. The CE Mark is a conformity marking consisting of the letters “CE.” The CE Mark applies to the products regulated by the central European health, safety and environmental protection legislation. The CE Mark is obligatory for products it applies to: the manufacturer affixes the marking in order to be able to sell their product in the European market.

The wireless device is approved to be used in the member states of the EU. NetComm Wireless declares that the wireless device is in compliance with the essential requirements and other relevant provisions of the Radio and Telecommunications Terminal Equipment Directive 1999/5/EC (R&TTE Directive). Compliance with this directive implies conformity to the following European Norms – N 60950 – Product Safety, EN 301 489 EMC, EN301511 GSM RF, EN301908 UMTS RF, EN 62311 SAR Technical requirement for radio equipment. A notified body has determined that this device has properly demonstrated that the requirements of the directive have been met and has issued a favourable certificate of expert opinion. As such the device will bear the notified body number 0682 after the CE mark.

The CE Marking is not a quality mark. Foremost, it refers to the safety rather than to the quality of the product. Secondly, CE Marking is mandatory for the product it applies to whereas most quality markings are voluntary.

Marking: The product shall bear the CE mark, the notified body number(s) as depicted to the left. CE0682.

CE0682

This product has also passed the following certification standards –

Health (Article 3.1(a) of the R&TTE Directive)

- EN 62311:2008 ; EN 50385 :2002

Safety (Article 3.1(a) of the R&TTE Directive)

- EN 60950-1:2006/A11:2009+A1:2010+A12:2011

Electromagnetic compatibility (Article 3.1 (b) of the R&TTE Directive)

- EN 301 489-1 V1.9.2, EN 301 489-3 V1.4.1, EN 301 489-7 V1.3.1
- EN 301 489-17 V2.2.1
- EN 301 489-24 V1.5.1
- EN 55022:2010/ AC:2011 Class B, EN55024: 2010
- EN 61000-3-2:2006/A1:2009/A2:2009, EN 61000-3-3:2008

Radio frequency spectrum usage (Article 3.2 of the R&TTE Directive)

- EN 301 511 V9.0.2, EN 301 908-1 V5.2.1, EN 301 908-2 V5.2.1

- EN 300 440-1 V1.6.1, EN 300 440-2 V1.4.1

RoHS Directive (2011/65/EU)

- EN 50581: 2012

NOTE: To comply with the RF exposure requirements, this equipment must be operated with a minimum of 20 cm separation from the user.

This is a regulatory requirement and applies to all 3G capable devices meeting standard regulatory compliance such as the compliance standards listed above.

FCC statement

FCC compliance

Federal Communications Commission Notice (United States): Before a wireless device model is available for sale to the public, it must be tested and certified to the FCC that it does not exceed the limit established by the government-adopted requirement for safe exposure.

FCC regulations

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This device has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorientate or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

IC regulations

This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions:

- (1) this device may not cause interference, and
- (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes:

- (1) l'appareil ne doit pas produire de brouillage, et
- (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement."

This Class B digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

IMPORTANT NOTE:

IC radiation exposure statement:

This equipment complies with IC RSS-102 radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator and users body.

Electrical safety

Accessories

Only use approved accessories.

Do not connect with incompatible products or accessories.

Connection to a car

Seek professional advice when connecting a device interface to the vehicle electrical system.

Distraction

Operating machinery

Full attention must be given to operating the machinery in order to reduce the risk of an accident.

Product handling

You alone are responsible for how you use your device and any consequences of its use.

You must always switch off your device wherever the use of a mobile phone is prohibited. Do not use the device without the clip-on covers attached, and do not remove or change the covers while using the device. Use of your device is subject to safety measures designed to protect users and their environment.

- Always treat your device and its accessories with care and keep it in a clean and dust-free place.
- Do not expose your device or its accessories to open flames or lit tobacco products.
- Do not expose your device or its accessories to liquid, moisture or high humidity.
- Do not drop, throw or try to bend your device or its accessories.
- Do not use harsh chemicals, cleaning solvents, or aerosols to clean the device or its accessories.
- Do not paint your device or its accessories.
- Do not attempt to disassemble your device or its accessories, only authorised personnel must do so.
- Do not use or install this product in extremely hot or cold areas. Ensure that the device is installed in an area where the temperature is within the supported operating temperature range (-40°C to 80°C)

- Do not use your device in an enclosed environment or where heat dissipation is poor. Prolonged use in such space may cause excessive heat and raise ambient temperature, which will lead to automatic shutdown of your device or the disconnection of the mobile network connection for your safety. To use your device normally again after such shutdown, cool it in a well-ventilated place before turning it on.
- Please check local regulations for disposal of electronic products.
- Do not operate the device where ventilation is restricted
- Installation and configuration should be performed by trained personnel only.
- Do not use or install this product near water to avoid fire or shock hazard. Avoid exposing the equipment to rain or damp areas.
- Arrange power and Ethernet cables in a manner such that they are not likely to be stepped on or have items placed on them.
- Ensure that the voltage and rated current of the power source match the requirements of the device. Do not connect the device to an inappropriate power source.

Children

Do not leave your device and its accessories within the reach of small children or allow them to play with it. They could hurt themselves or others, or could accidentally damage the device.

Your device contains small parts with sharp edges that may cause an injury or which could become detached and create a choking hazard.

Emergency & other situations requiring continuous connectivity

This device, like any wireless device, operates using radio signals, which cannot guarantee connection in all conditions. Therefore, you must never rely solely on any wireless device for emergency communications or otherwise use the device in situations where the interruption of data connectivity could lead to death, personal injury, property damage, data loss, or other loss.

Device heating

Your device may become warm during normal use.

WEEE approval

The wireless device is approved to be used in the member states of the EU. NetComm Wireless declares that the wireless device is in compliance with the essential requirements and other relevant provisions of the Waste Electrical and Electronic Equipment Directive 2002/96/EC (WEEE Directive).

Faulty and damaged products

Do not attempt to disassemble the device or its accessories.

Only qualified personnel must service or repair the device or its accessories.

If your device or its accessories have been submerged in water punctured or subjected to a severe fall, do not use until they have been checked at an authorised service centre.

Interference

Care must be taken when using the device in close proximity to personal medical devices, such as pacemakers and hearing aids.

Pacemakers

Pacemaker manufacturers recommend that a minimum separation of 15cm be maintained between a device and a pacemaker to avoid potential interference with the pacemaker.

Hearing aids

People with hearing aids or other cochlear implants may experience interfering noises when using wireless devices or when one is nearby.

The level of interference will depend on the type of hearing device and the distance from the interference source, increasing the separation between them may reduce the interference. You may also consult your hearing aid manufacturer to discuss alternatives.

Medical devices

Please consult your doctor and the device manufacturer to determine if operation of your device may interfere with the operation of your medical device.

Hospitals

Switch off your wireless device when requested to do so in hospitals, clinics or health care facilities. These requests are designed to prevent possible interference with sensitive medical equipment.

Interference in cars

Please note that because of possible interference to electronic equipment, some vehicle manufacturers forbid the use of devices in their vehicles unless an external antenna is included in the installation.

Explosive environments

Petrol stations and explosive atmospheres

In locations with potentially explosive atmospheres, obey all posted signs to turn off wireless devices such as your device or other radio equipment.

Areas with potentially explosive atmospheres include fuelling areas, below decks on boats, fuel or chemical transfer or storage facilities, areas where the air contains chemicals or particles, such as grain, dust, or metal powders.

Blasting caps and areas

Turn off your device or wireless device when in a blasting area or in areas posted turn off “two-way radios” or “electronic devices” to avoid interfering with blasting operations.

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