

GrayWolf

Sensing Solutions



Setting up PC-3500/4000/5000 for GrayWolf Live

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Table of Contents

General Information.....	3
Setting Up the GWL Account.....	3
Updating Firmware.....	3
Connecting to Wi-Fi.....	4
Connecting to Internet via Ethernet Port.....	5
Configuring JSON Settings.....	5
Setting Time Zone.....	7



General Information

The PC-3500, PC-4000, and PC-5000 can be outfitted with a Wi-Fi card from the manufacturer, allowing the units to POST JSON data packets to a custom URL and port or more commonly to GrayWolfLive. All of the possible readings found on the PC-3/4/5 can be send to GrayWolfLive, including but not limited to: PM values, raw counts, counts per m³, Temperature, Barometric pressure, and Relative humidity. By default, GrayWolf will configure the PC-3500/4000/5000 to post data to GrayWolfLive and you can use your GrayWolfLive account to view the readings. Data is only sent when a sample is completed and may take up to 1- minute depending on the connection and the amount of data being sent.

Setting Up the GWL Account

Your GrayWolfLive account is set up internally by your sales representative and the accounts team. Once complete, you will receive a GrayWolfLive welcome letter that will provide your login credentials. If you do not have an account set up yet or have not received your GrayWolfLive Welcome email, contact your sales representative or email SalesTeam@GrayWolfSensing.

When having your sales representative set up your GrayWolf Live account please provide them with the following.

- * **Customer Full Name:** John Smith
- * **Company/Agency Name:** ABC Environmental
- * **Customer First Name:** John
- * **Customer Email:** JohnS@ABCenvironmental.com
- * **Optional Read-Only Email:** Guest@ABCenvironmental.com
- * **Wi-Fi Security Type:** WPA2 (other common ones are: open, WPA, WPA2-personal, WPA2 Enterprise)
- * **Captive Portal / Secondary Login?:** YES / NO
- * **Readings Selection:** See the table for available options in “Configuring JSON Settings”.
- * **Location/ Time Zone the Particle Counter will be used:** California, Pacific Standard time, UTC-8

Updating Firmware

The PC-3/4/5 requires a firmware update for improved connection to a broader range of Wi-Fi security types. The new firmware adds in the option to specify the type of network the unit will be connecting to, as well as a JSON timeout reset variable that allows us to increase the timeout reset duration. This prevents the unit from quitting an attempt before connection is established.

If you purchased your particle counter to be used with GrayWolfLive prior to January 1st 2022, and are experiencing difficulties connecting, you may contact the GrayWolf service department to see if a firmware update is recommended for your device. https://graywolfsensing.com/contact_service/

Connecting to Wi-Fi

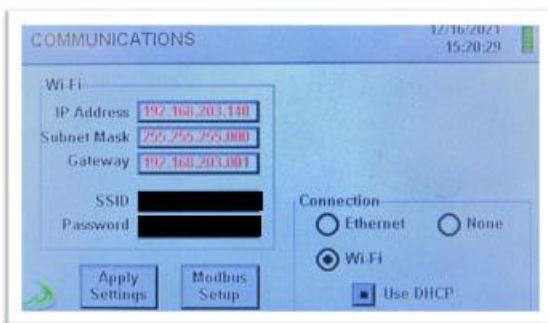
The PC-3/4/5 Wi-Fi module must be installed at the time of purchase and can connect to 802.11 b/g 2.4GHz wireless networks. It is compatible with the following network security types: WPA/WPA2-Personal with a Pre-Shared Key (PSK) a password that is distributed to all users of the network, or Open networks not requiring a password.

For open-networks that require a Secondary Log-In or Captive Portal to log onto the network, the PC-3/4/5 does not have a web-browser or user-interface, so it is not possible to respond to prompts or enter additional log-on information. The simplest solution is to “white-list” the PC-3/4/5’s MAC address. You or your IT department enter the MAC Address it into your router’s safe-device or white-list table. Devices that are white-listed will generally bypass the secondary prompt.

Wi-Fi can be configured on the device. Prior to shipping the unit will be tested and QC checked before being setup with your GrayWolfLive information. Once the particle counter arrives, it will just need to be connected to your Wi-Fi network. If you cannot connect due to a Captive Portal or secondary log-in, contact GrayWolf Tech Support at : Tech-Support@GrayWolfSensing.com or by calling 1-203-402-0477.

Procedure:

1. The unit can be connected to Wi-Fi directly on the device by going to the units **Settings**, then **Communication**.
2. The following window will come up to enter the Wi-Fi SSID and Password. The connection can be set up manually with the IP address, Subnet Mask, and Gateway, but the unit will find that information automatically if **Use DHCP** is checked.
3. Once connected, the particle counter will begin sending data to GrayWolfLive. After each sample is completed, the data will be sent. See JSON settings below for the options on what type of data may be sent.



Connecting to Internet via Ethernet Port.

The PC-3500, PC-4000, and PC-5000 can also be connected to an internet connection directly via the ethernet port on the side of the unit. First, connect the unit directly to your router. Next, go to **Settings**, then **Communication**. Select **Ethernet** as the connection type and **Use DHCP** to find the IP address, subnet mask, and gateway automatically. With this connection type, the security of the network connection is on behalf of the customer. Once the connection is set up, the data flow of the JSON packets is one-way, such that the unit sends out data once new data is present. There is no external input or control over the JSON interface.

Configuring JSON Settings

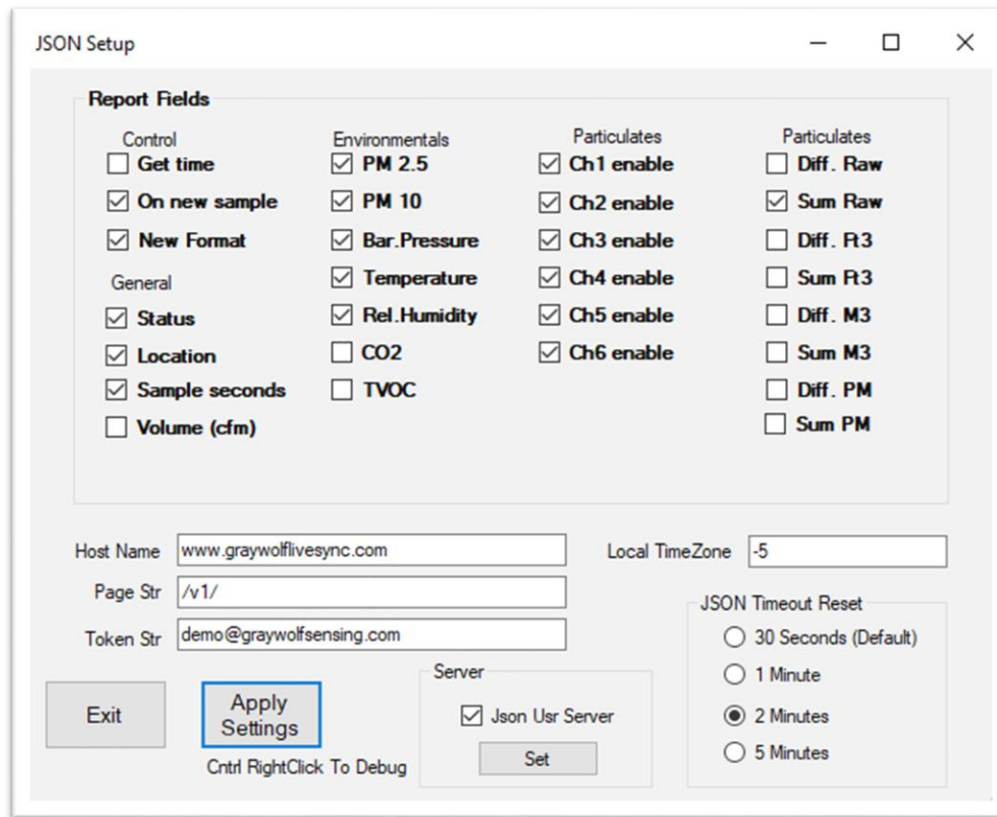
The JSON settings control where the particle counter connects to (GrayWolfLive web server) and what kind of data is sent. 8 types of particulate readings can be selected for all 6 channels to GWL at once, as well as other environmentals. If many readings are selected it can take up to a minute for the data to be sent to GWL. To prevent the JSON packet from being cut off or not sent all-together, a 1-minute hold time is recommended between samples.

Below is a table of the possible data type that may be sent to GrayWolfLive. They are compared to the names of readings in the device itself:

Data Type	PC-3500/4000/5000	Description
PM 2.5	PM 2.5	Mass concentration reading for particles smaller than 2.5 microns. Most common particulate measurement when assessing air quality.
PM 10	PM 10	Mass concentration reading for particles smaller than 10 microns. Most common particulate measurement when assessing air quality.
Bar. Pressure	Barometric Pressure	Barometric Pressure comes standard on all particle counters
Temperature	Temperature	Given in °C. PC-GW4000-RHCF temperature and Relative Humidity sensor attachment for PC-3500/4000/5000 must be purchased separately.
Relative Humidity	Relative Humidity	PC-GW4000-RHCF temperature and Relative Humidity sensor attachment for PC-3500/4000/5000 must be purchased separately.
CO2	Carbon Dioxide	Carbon Dioxide readings given in PPM. 0 to 5,000 ppm $\pm 65\text{ppm} \pm 3\%$ rdg. PC-GW4005-KIT or PC-GW5005-KIT must be purchased. Then PC-GW4005-CO2 must be added on at purchase.
TVOC	TVOC	Total Volatile Organic Compounds reading given in PPB. 0 to 50ppm range, <5ppb L.O.D. (PC-4005 only)

		PC-GW4005-KIT or PC-GW5005-KIT must be purchased. Then PC-GW4005-TVOC must be added on at purchase.
Options below may be selected for any combination of the 6 different particulate channels, including all at once. All channels reporting all data types will provide 48 different readings.		
Diff. Raw	Δ	Differential Raw Counts for each channel. Raw Counts are all particles detected during a sample for a given channel.
Sum Raw	Σ	Cumulative Raw Counts for each channel. Cumulative Raw Counts for a given channel are a sum of the Differential Counts of that channel plus all larger channel sizes. EX: $\Sigma 1\mu\text{m} = \Delta 1\mu\text{m} + \Delta 2.5\mu\text{m} + \Delta 5\mu\text{m} + \Delta 10\mu\text{m}$
Diff. FT3	Δft^3	Differential Counts per ft^3 . Δft^3 is the Differential Raw Count for a channel by volume in ft^3 .
Sum FT3	Σft^3	Cumulative Counts per ft^3 . Σft^3 is the Cumulative Raw Count for a channel by volume in ft^3 .
Diff. M3	Δm^3	Differential Counts per m^3 . Δm^3 is the differential raw count for a channel by volume in m^3 .
Sum M3	Σm^3	Cumulative counts per m^3 . Σm^3 is the Cumulative Raw Count for a channel by volume in m^3 .
Diff. PM	$\mu\text{g}/\text{m}^3$	Differential mass concentration reading of $\mu\text{g}/\text{m}^3$ for each channel. Mass of detected particles of a given channel by volume.
Sum PM	PM	Cumulative mass concentration reading. PM values are a sum of all the differential mass concentrations for all channels smaller than the given channel. EX: $\text{PM } 2.5 = \mu\text{g}/\text{m}^3 \text{ of } 1\mu\text{m} + 0.5\mu\text{m} + 0.3\mu\text{m}$ There is no PM 0.3 reading on these devices.

For advanced users, the IMS software may be supplied by GrayWolf so you can make changes to the JSON configuration and the output data on your own. To do so you will need the USB-A to USB-B cable supplied with your particle counter, and the most recent version of the IMS Software. please contact your sales representative or send an email to Salesteam@graywolfsensing.com to receive a copy.



Setting Time Zone

Setting the proper time zone is critical for you to see the correct time stamps in GrayWolfLive. Below is a list of values relative to UTC to be used for a given time zone. Keep in mind that anything in UTC or GMT will have an offset of **-0**. The time on the PC-3/4/5 is simply set to whatever the local time of the unit will be. Be sure to report where you intend to use the equipment to your sales representative so GrayWolf can set the proper time zone for you.

Please reference the maps below to determine the time zone offset used.

Name	Description	Offset Relative to UTC
GMT	Greenwich Mean Time	-0
UTC	Universal Coordinated Time	-0
ECT	European Central Time	1
EET	Eastern European Time	2
ART	(Arabic) Egypt Standard Time	2
EAT	Eastern African Time	3
MET	Middle East Time	3
NET	Near East Time	4
PLT	Pakistan Lahore Time	5
IST	India Standard Time	5
BST	Bangladesh Standard Time	6
VST	Vietnam Standard Time	7

CTT	China Taiwan Time	8
JST	Japan Standard Time	9
ACT	Australia Central Time	9
AET	Australia Eastern Time	10
SST	Solomon Standard Time	11
NST	New Zealand Standard Time	12
MIT	Midway Islands Time	-11
HST	Hawaii Standard Time	-10
AST	Alaska Standard Time	-9
PST	Pacific Standard Time	-8
PNT	Phoenix Standard Time	-7
MST	Mountain Standard Time	-7
CST	Central Standard Time	-6
EST	Eastern Standard Time	-5
IET	Indiana Eastern Standard Time	-5
PRT	Puerto Rico and US Virgin Islands Time	-4
CNT	Canada Newfoundland Time	-3.3
AGT	Argentina Standard Time	-3
BET	Brazil Eastern Time	-3
SGT	South Georgia Time	-2
CAT	Central African Time	-1