VATA VERKS
water and gas intelligence for buildings

Non-Invasive, Whole-Building
Water Data Acquisition **VV – 100 – XX – W**
Gas Data Acquisition **VV – 100 – XX – G**

**CONFIGURING
DATA TRANSMISSION**

VV-100
Configuring Data Transmission

Modbus TCP / Modbus RTU / HTTP Publish / MQTT / Pulse / Data Logging / Telnet / Web Server
not all features available on all units

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**CONFIGURING
DATA TRANSMISSION**

ACCESSING COMMAND WINDOW
Locally or Remotely

VV-100 unit must be assembled with Sensor Probe.
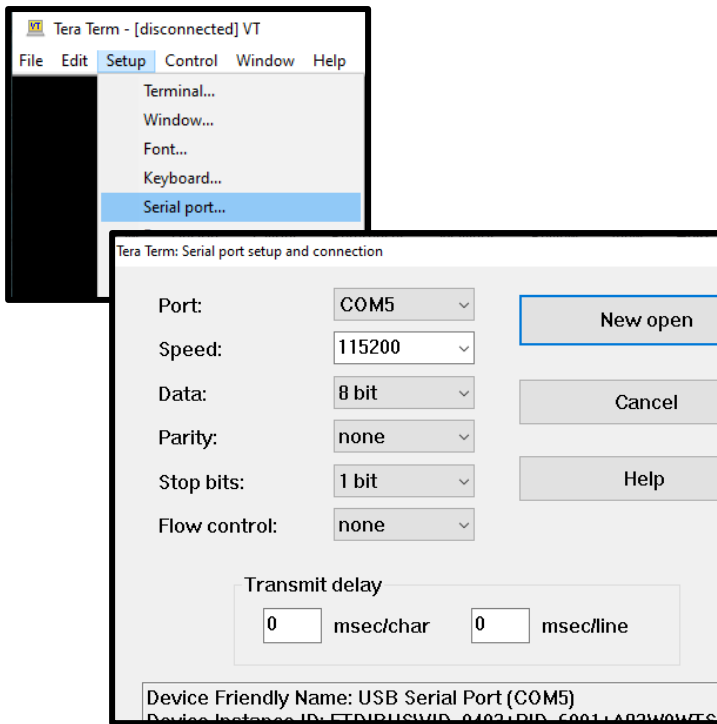
Laptop must have Tera Term (or other Emulator) and Driver loaded.   (See pg 3: Meter Specific Instructions)

Locally over USB cable

Connect Main Unit to laptop with mini USB cable
Open **Tera Term**:
   a.   Choose "**Setup**" dropdown
   b.   Choose **Serial Port…**

At Serial Port Setup Window (above)
   a.   **Configure** as shown above**
   b.   Click **New Open**

At Command Window
   a.   ENTER   for Username Prompt
   b.   **Username:**   admin   ENTER
   c.   **Password:**   admin   ENTER
   d.   M>   ENTER for Main Menu
   e.   C   ENTER for Communication Menu

If Port prompt is "grey", and sensor is connected to serial port as directed, your laptop's FTDI Driver may be missing. Download the VCP driver from: www.ftdichip.com
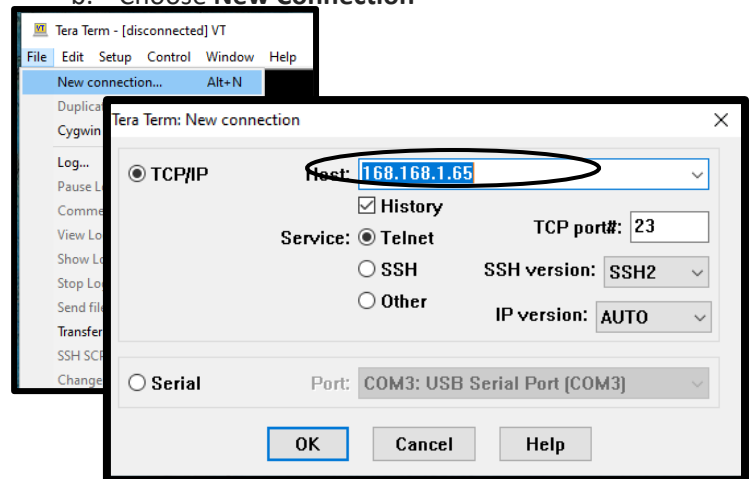***This Tera Term configuration can be saved for future use at:
"Setup" Drop Down, "Save Setup".**

Remotely over Telnet

Telnet must be enabled and IP address known. Must be accessible via local network or VPN over ETHERNET.

Open **Tera Term.**
   a.   Choose **File** dropdown
   b.   Choose **New Connection**

At New Connection Window
   a.   Input the Device's **IP Address** at **Host**
   b.   Choose **TCP/IP**. **Telnet**.   TCP Port **23**. **OK**
At Tera Term: Choose **Setup** dropdown
   a.   Choose **Terminal**
   b.   Click **Local Echo. OK**

Pro Tip: A Telnet session improperly closed will remain Open for 10 min, not allowing re-entry.
To avoid this, Close using **Disconnect** in the **File** dropdown OR simply close the Telnet application
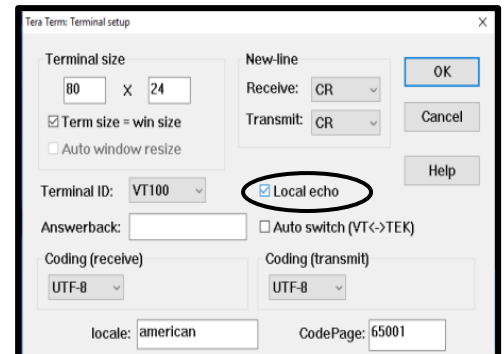
At Command Window
   a.   ENTER for Username Prompt
   b.   **Username**:   admin   ENTER
   c.   **Password**:   admin   ENTER
   d.   M>   ENTER for Main Menu
   e.   C   ENTER for Communication Menu

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**CONFIGURING
DATA TRANSMISSION**

Configuring Communication
MQTT / Modbus TCP

Unit Must be Assembled, with Sensor Probe Connected.

1. **C** **ENTER** to go to **Communication Menu**

Make Selection: **0**=None **1=MQTT** **2=Modbus TCP** 3=HTTP Publish 4=Modbus RTU Slave 5=Modbus RTU

2.

1 **ENTER** **to enable MQTT**

Note: If choosing the MQTT protocol contact Vata Verks at **info@vataverks.com**.

Configure MQTT Broker Information

COMMUNICATION MENU: MQTT MENU
d - Display MQTT configuration
t - Enter MQTT publication period (>= 1sec)(t ###)
n - Enter MQTT publication name (n xxxx)
b - Enter MQTT broker URL (b MQTTBroker.com)
c - Enter MQTT Broker port (c ####)
u - Enter MQTT Broker username (u xxxx)
p - Enter MQTT Broker password (p xxxx)
S - Save configuration
M - Return to Main Menu
MQTT:

Enter all the required information for your Broker.

S **ENTER** to Save
d **ENTER** to confirm configuration.

Check Display to confirm

Continue to the **Network Menu** (see pg 7)

2 **ENTER** **to enable Modbus TCP**

Modbus TCP Enabled
Modbus Port: 123
MQTT Disabled
Change Modbus TCP port y/n?
(usually 'n')
Save configuration y/n?
.
.
.
.
Continue to the **Network Menu** (see pg 7)

For Modbus Register Assignments (see pg 8)

MQTT JSON String Sample Output

{"flow":"0.00","total":"0.15","temp":"28","time":"2000:01:01T00:58:28","mac":"36:39:0A:00:00:A5",
"kFactor":"60.0000","revs":"8","minflow":"0.00"}

MQTT Pro Tip
The Vata Verks sensor must be "Tracking"
in order to Publish.
No Tracking = No Receiving

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**CONFIGURING
DATA TRANSMISSION**

Configuring Communication
HTTP Publish

Unit Must be Assembled, with Sensor Probe Connected.

The HTTP Publish Notification feature pushes data, at a User programmed Publication Interval, from the Vata Verks sensor through a network connected Ethernet port to the User's Broker.

1.   C   ENTER   to go to **Communication Menu**

Make Selection: **0**=None   1=MQTT   2=Modbus TCP   **3=HTTP Publish**   4=Modbus RTU Slave   5=Modbus RTU Master

2.   3   ENTER   **to enable HTTP Publish**

3. Configure HTTP Publish Notification

	HTTP COMMANDS MENU	DESCRIPTION
d	Display HTTP configuration	
t	Enter HTTP publication period [1 to 6500 sec][t ###]	the number of seconds between each publication
n	Enter HTTP publication name (n xxxx)	name / token included in the publication request to inform server of data origination
b	Enter HTTP server URL (b www.server.com)	the URL that the publication will be directed to (ex: www.vataverks.com)
c	Enter HTTP Server port (c ####)	the port that the server is listening on (ex: 80).
r	Enter HTTP Resource (r receiver.php)	the server-side program that will process the request (ex: publication.php)
S	Save configuration	
Some configurations require a reset to take effect		
M	Return to Main Menu	

S   ENTER to Save the Configuration
d   ENTER to display and confirm the Configuration

4. Completing the HTTP Publish Transmission
   a. To Include Correct Volume Total (instead of just revolutions)
      Enter the meter's K-factor in the **Tracking Menu**.:   For meter K-factor discovery, see **Instructions*.**
   b. To Include Correct Timestamp
      Enter Data and Time in 24 hour format (GMT or Local time) in the **Maintenance Menu**.
      t(space)yyyy:mm:dd**T**hh:mm:ss   example: t 2021:12:16**T**14:37:00
   c. To Include Flow Data
      To include Instantaneous Flow Rate at time of transmission
      To include Minimum Flow Rate since last transmission
      The Unit must have the **Ultra Hi-Resolution** Option.**

5. Continue to **Network Menu** and configure (see pg 7.

6. See HTTP Publication Format (see pg 5)

HTTP Pro Tip
The Vata Verks sensor must be "Tracking"
in order to Publish.
No Tracking = No Receiving

* See all instructions at: **www.vataverks.com/support/**
**Email to info@vataverks.com to upgrade to Ultra Hi-Resolution.
      Include unit Serial # from Maintenance Menu

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**CONFIGURING
DATA TRANSMISSION**

Configuring Communication
HTTP Publish Format

Data will be provided as an extension in a HTTP GET request. The GET request will include the Server Resource address with the data appended.   The data provided will be the following:

Data Item	Format	Description	Default
Token	24 character string	Token / Publication Name, can be user assigned.	Device Serial Number
MacAddress	12 character string	Device MAC address, can be user assigned, in Hex format.	Factory preassigned MAC address
Timestamp	YYYY-MM-DDTHH:MM:SS	Time of data sampling, 24 hour format.	Set by user. Unset=2000-01-01T00:00:00
kFactor	Decimal format	The current device k-factor, can be user defined	Default is 60.0
Volume	Decimal format	The accumulated volume from the start of tracking	=Revolutions / K-Factor
Revolutions	32 bit integer Format	Revolution accumulation	Reported as unsigned 32 bit integer
FlowRate	Decimal format	Change in Volume over 1 second	Requires Ultra Hi-Res Option**
MinFlowRate	Decimal format	Minimum flow rate seen since the last report	Requires Ultra Hi-Res Option**
Temperature	Integer	The current temperature at the sensor in degrees C	

HTTP Publish Format
1) The device will first establish a TCP connection to the server using the URL information provided.
   a. If a connection cannot be established the device will not try again until the next publication period.
2) If connection is successfully established, the device will send an HTTP GET request as follows:

GET /<Server Resource Address>?Token=<Configured Token>&MacAddress=<device MAC address>&Timestamp=<YYYY-MM-DDTHH:MM:SS>&kFactor=<configured k-factor>&Volume=<Current volume>&Revolutions=<Revolution Count>&FlowRate=<Current flow rate, fine tracking option only>&MinFlowRate=<Current minimum flow rate, fine tracking option only>&Temperature=<Current sensor temperature>

Example of GET without Ultra Hi-Resolution Tracking Option:**
GET /CGI/Vataverks.php?Token= AB5000323138511435373937&MacAddress=A1:34:BC:33:09:FE&Timestamp=2020-30-04T13:01:22&kFactor=60.0&Volume=1239876.52&Revolutions=123456&Temperature=22

Example of GET with Ultra Hi-Resolution Tracking Option:**
GET /CGI/Vataverks.php? Token= AB5000323138511435373937&MacAddress=A1:34:BC:33:09:FE&Timestamp=2020-30-04T13:01:22&kFactor=60.0&Volume=1239876.52&Revolutions=123456&**FlowRate=0.35&MinFlowRate=0.01&**Temperature=22

Note: URL encoding will be applied to the information published.

3) The device will wait for a response from the server and once received the device will close the connection.
   a. If no response is received within 1 minute, the device will close the connection. No retries will be made.

* See all instructions at: **www.vataverks.com/support/**
**Email to info@vataverks.com to upgrade to Ultra Hi-Resolution. Include unit Serial # from Maintenance Menu

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**CONFIGURING
DATA TRANSMISSION**

Configuring Communication
Modbus RTU

The VV-100 can be configured for Modbus RTU (Slave / Master) and assembled into an array.

U14 Switch

1. Remove top.   Find Switch U14 (follow option below). Close top
   a. **If a Slave** and last in Array: U14 Switch #2 = 'ON' (to terminate)
   b. **If a Slave** and NOT last in Array: U14 Switch #2 = 'OFF'
   c. **If a MASTER**   U14 Switch #2 = 'ON' (to terminate)

2. **See Meter Specific Instructions pg 3:** Assemble with probe. Access **Main Menu**

   C   **ENTER** to enter Communication Menu
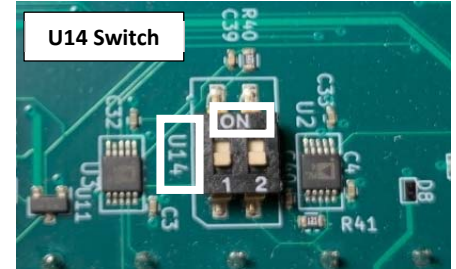
3. Select: **0**=None **1**=MQTT **2**=Modbus TCP **3**=HTTP Publish **4=Modbus RTU Slave** **5=Modbus RTU Master**

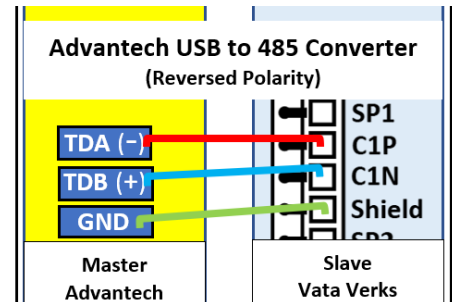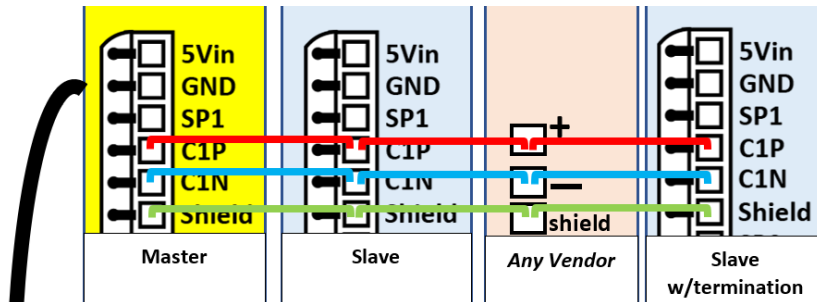|	
4 ENTER to enable RTU Slave COMM>4 Disable Modbus TCP y/n? **Y ENTER**	**5 ENTER to enable RTU Master** COMM>5 MQTT Disabled Modbus TCP Enabled (default) TCP Port: 502 HTTP Publish Disabled Modbus RTU Master Enabled - Local Address: 170 **Change Modbus TCP port y/n?**

4. **Configure as necessary for your sensor array.**
   d - display configuration
   b - Set Modbus Baud rate (ex: b 5)   (1=2400   2=4800   3=9600   4=19200   5=38400   6=57600   7=115200)
   s - Stop bits (s x) [1 or 2, default 1]
   p - Parity o=Odd, e=Even, n=None (p x) default None
   n - Local RTU Slave address (n xxx) default 170   NOTE: ADDRESSES MAY NOT REPEAT IN SAME SENSOR ARRAY

5. **S   ENTER** to save configuration
6. **MASTER Unit ONLY**: See pg 7 to Configure Network AND Activate new Network settings. Then return here.
7. Label the Device: "**Slave**" , "**Slave with Termination**" OR "**Master**" to avoid onsite mix-ups.
8. Wire units into the RTU array (see below) with shielded double twisted pair (ex: Belden 3107A)
   WIRING NOTE: Polarity can be vendor dependent. (Advantech example shown).
   Reverse the C1P / C1N wiring, If unit fails to communicate.
9. **MASTER Unit ONLY**: Connect the Master Unit to the network via Ethernet connection.
10. Disconnect from laptop: Connect to Wall Power OR 5VDC via Terminal Strip
11. For Modbus Register Assignments: See pg 8

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CONFIGURING
DATA TRANSMISSION

Configuring Network
Telnet / MQTT / Modbus TCP / HTTP Publish / Modbus RTU

N   ENTER   to go to Network Menu
   The current configuration will be displayed.
Network Menu
Active Network Configuration
DHCP Enabled
IP Address:0.0.0.0
GW Address:0.0.0.0
NetMask:0.0.0.0
DNS1:0.0.0.0   (Primary)
DNS2:0.0.0.0   (Secondary)
MAC Address: 4E:00:3F:31:38:51
Telnet Port: 23
Telnet Enabled
Web Server Port: 80
(Advanced) White List Mask:0.0.0.0
(Advanced) White List IP Address:0.0.0.0
   Configure Network y/n?
y   **ENTER** if changes are required.

NOTE: If DHCP is enabled, and the unit is connected to the Network, your network configuration will automatically populate.

NOTE: For future Telnet access record the IP Address

IMPORTANT: See Networking Note below.

> **d - DHCP**
> **m - MAC address**
> **n - DNS server**
> **t - Telnet port**
> **s - Telnet Enable/Disable**
> **w - Web Server Port**
> **1 - (Advanced) Server White List Mask**
> **2 - (Advanced) Server White List IP**
> **S - Save configuration**
> **Some configurations parameters require a reset to take effect**

WARNING: Two devices on one Network <u>cannot</u> use same MAC address. The MAC address is derived from the Serial # and stored on the Config.txt file. If the Config.txt file is copied to another unit the MAC address is copied too. See pg 13 to Correct.

NETWORKING NOTE: DHCP AND STATIC IP ADDRESSES
If remotely connecting to the device using Telnet, Modbus TCP or the Web Interface, the IP address must be <u>known</u>.
Static IP is the recommended configuration.   The static IP address must be on the same subnet as your router or gateway. (see your Network Administrator).
DHCP: Unless your server is configured to provide a constant IP address, the DHCP server will provide a new <u>unknown</u> IP address with each boot-up.

Activating new Network Configuration
Telnet / MQTT / Modbus TCP / HTTP Publish / Modbus RTU

1. Network Configuration changes **<u>MUST</u> BE Saved,** and the Unit **Reset** for changes to become active.
   S   ENTER   to Save the configuration
   Z   ENTER   to open Maintenance Menu
   R   ENTER   to Soft Reset the device and activate the new configuration
   Saved changes will survive reset. Calibration / Revolution Count will survive Soft Reset.
   N   ENTER   to open Network Menu and confirm Configuration

2. For Modbus TCP: pg 8 for Registers
   For Modbus RTU: pg 6 to install in array. Pg 8 for Registers
   For HTTP Publish: pg 5 for publication format

3. Finalize: Confirm Unit communication is being received.
   S   ENTER   to Save.
   M   ENTER   to go to **Main Menu**
   g   ENTER   to Log Off
   Unplug USB and Plug into wall power.   **Done**

> **Enter Date/ Time in (Z) Maintenance Menu**
> **t(space)yyyy:mm:ddThh:mm:ss**
>   (example: t 2021:02:28**T**05:46:00)
>   Means: Feb 28 2021 5:46:00 AM

VATA VERKS — VV-100 Modbus Interface Specification

Modbus Holding Register Map (Function Code 3) for the Vata Verks VV-100 Standard Sensor

Register Offset	Read/Write		Ultra Hi-res Option Only	Description	Item Ref
00	R	Version		Firmware version number.	
01	R	Reserved			
02	R	K-factor		Converts raw revolution data to Volume (gal,ft³,M3). Revolution/K-factor=Volume	
03	R	Reserved			
04	R	Reserved			
05	R	State		See Module State Table Below	
06	R	Total Volume - Fraction		The fractional value of total volume in thousands. Contain values 0 to 999.	1
07	R	Total Volume: Low Word		Provides a 32 bit representation of Total Volume.	1
08	R	Total Volume: High Word			
09	R	Flow Rate Fraction	x	The fractional part of the flow rate in thousands. Contain values 0 to 999.	2
0A	R	Flow Rate*	x	The flow rate as estimated over the last second. In Total Volume/minute.	2
0B	R	Minimum Flow Rate Fraction	x	The fractional part of the minimum flow rate in thousands.	2
0C	R	Minimum Flow Rate*	x	Minimum flow rate observed during sample interval. In Total Vol./minute.	2
0D	R	Temperature		The sensor probe temperature in degrees C	
0E	R	Angle	x	The raw angle measurement of the meter.	
0F	R	Revolutions: Low Word		Provides a 32 bit representation of Revolution Count	
10	R	Revolutions: High Word			
11	R	Maximum Flow Rate*	x	Maximum flow rate observed during sample interval. In Total Vol./minute.	2
12	R	Maximum Flow Rate Fraction	x	The fractional part of the maximum flow rate in thousands.	2
13	R	Reserved			
14, 15	R	Flow Rate**	x	Floating Point Flow Rate during sample interval**. (Vol/min)	
16, 17	R	Minimum Flow Rate**	x	Floating Point Min Flow Rate during sample interval**. (Vol/min)	
18, 19	R	Maximum Flow Rate**	x	Floating Point Max Flow Rate during sample interval**. (Vol/min)	

*See Registers 14 - 19 for flow rates in floating point format. **go to Tracking Menu to set flow rate "sample interval" 1 sec. OR 1 min.

Module State Table (for Register 05 above)

00	Idle	Is not tracking and is waiting to be placed into a working state
01	Unused	
02	Unused	
03	Track	Is acquiring the magnetic signal, waiting to start tracking.
04	Tracking	Is currently tracking the magnetic signal of the meter.
05	Measuring	Is not tracking and is currently in measurement mode.
06, 07	Recording	Is recording signal data to the SD card.
08	Error	A detectable error has occurred and can no longer track the magnetic signal.
09	Low Voltage Condition	Does not have enough Voltage to operate properly
0A	Initializing	Should not be observed, the device is going through its initialization phase.

ITEM 1

Total Volume

Total volume is calculated as the total revolutions divided by the k-factor.

Total Volume=(R08*65536)+R07+(R06/1000)

Total Revolutions= (R10*65536)+R0F

NOTE: Any read of this set of registers must be done in a single command to maintain data coherence.

ITEM 2

Flow Rate, Min. Flow Rate, Max. Flow Rate

Flow rates are given in volume per minute.

Flow rates are calculated over a 1 second interval.

Flow rate is calculated as the current revolution count (minus) previous revolution count taken 1 second prior. A floating point representation of flow rate can be calculated as

Flow rate=R0A+R09/1000.

Minimum flow rate is the lowest flow rate calculated since the last register read. Minimum flow rate is set to an arbitrary large value (40) on a read and then calculated after 1 second.

Minimum flow rate=R0C+R0B/1000

NOTE: Any register read will reset both the minimum and maximum flow rate registers therefore it is important to read all the registers in a single read command otherwise the values will not be valid.

Maximum flow rate is the highest flow rate encountered since the last read. When a read occurs it is reset to 0 and then 1 second later will be recalculated over the last 1 second interval.

Maximum flow rate=R11+R12/1000

NOTE: Modbus represents data as 16 bit integers. To transmit larger integers or fractions of an integer, more than one register is required.

IMPORTANT: When reading registers, ALL registers MUST be read at once, or as a block. Data will be incoherent otherwise.

IMPORTANT: The Meter's K-factor must be entered in Tracking Menu for accurate Volumes & Flows. If K-factor is set as 1.0, All Volumes and Flows will be in Meter Revolutions.

Configuring Communication
Pulse

Unit Must be Assembled, with Sensor Probe Connected.

▶ ## Installation with On-Site Laptop

1. **Install On-Site**   Track Flow.   See your **Meter Specific Instructions.**
2. **K-factor**   =Revolutions / Unit Vol.   Calculate if unknown.   See your **Meter Specific Instructions.**
3. **Wire Pulse**   **C**onnect terminals Common + **EITHER** Norm Open or Norm Closed to your pulse counter.
4. **Pulse K-factor**   =Revolutions / Pulse

Pulse K-factor Options

A) Generic Pulse k-factor, ex: 1.0, 10.0 Revs / Pulse is easiest to Pre-Configure. Volume is then calculated in the back end using the Meter k-factor.

B) Volumetric Pulse k-factor: Each Pulse represents a unit volume (ex: 1 ft3). Use Meter K-factor to calculate the revolutions required for that volume.
Ex: If K-factor = 9.07 revs/ft^3 and Pulse Volume= 10 ft^3, then
Pulse K-factor = 90.70 revs/pulse

Pro Tip:
A low Pulse k-factor (ex: 1 revs) will rapidly pulse to confirm wiring, and Pulse Counting. Once confirmed the final Pulse K-factor would be entered.

---

5. **Configure On-Site**

P	ENTER	to go to Pulse Menu
e(space)y	ENTER	Enables Pulse
k(space)xx.xx	ENTER	Choose a Pulse k-factor. ex: k(space)4335.27
S	ENTER	to Save
d	ENTER	to display and confirm your configuration.

6. Confirm that Pulses are being counted.
     If not: Confirm wiring. Increase Pulse width. Reset the device

7. Optional: Enter Date / Time in **Maintenance Menu** to be noted with any logged events in the log file.
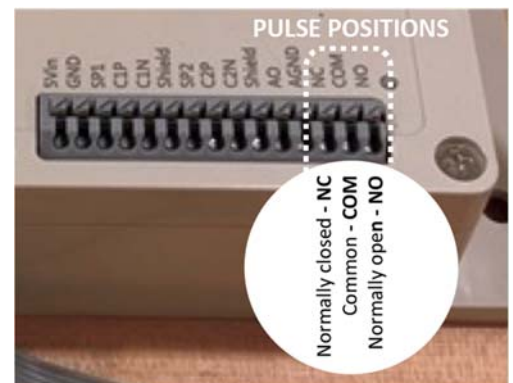
8. Return to **Main Menu** and log off.

9. Unplug the USB cord from the laptop and plug into wall power.
   Done.

Pulse Specifications

a. Pulse type   Dry contact / mechanical relay
b. Pulse Width: 10 – 100 msec (default = 50 msec)
c. Max Res*   1 Revolution. (incompatible with Ultra Hi-Res)
d. Max Voltage: 48V AC or DC
e. Max Current: 100mA
f. Pulse Wiring: 16 to 24 Gauge Twisted Pair
g. Pulse K-Factor   User Defined Volume per Pulse in Revolutions.
   *Minimum Pulse K-factor = 1.00 meter revolution

Pulse may run simultaneously with Data Logging, and any 1 of
(Modbus RTU, Modbus TCP, HTTP Publish or MQTT)

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**CONFIGURING
DATA TRANSMISSION**

Configuring Communication
Pulse

Unit Must be Assembled, with Sensor Probe Connected.

▶ **Installation Without On-Site Laptop**

1. Configure Off-Site   Configure the Pulse Output via **Tera Term** on laptop. (see **pg. 2**)

P	**ENTER**	to go to Pulse Menu
e(space)y	**ENTER**	Enables Pulse
k(space)xx.xx	**ENTER**	Choose a Pulse k-factor. Revs per Pulse* (see below)
S	**ENTER**	to Save
d	**ENTER**	to display and confirm your configuration.

---

*Pulse K-factor Pro Tip:

Pulse K-factor = Revolutions per Pulse.
If K-factor is unknown, use whole numbers for Pulse K-factor

If too large: it is difficult for installer to confirm Pulse Counting
A Pulse K-factor of **1.0**   is recommended for diaphragm gas meters.
A Pulse K-factor of **10.0** is recommended for all other fast spinning meter types.
The VV-100 will "click" with each Pulse transmission.

---

2. Install On-Site   Install Unit per **Meter Specific Instructions** (Use Section for "no laptop on-site")
3. Wire Pulse   Use Twisted Pair to connect Unit to your Pulse Counter (see pg. 9)
4. K-factor**   Calculate K-factor and Volume / Pulse On OR Off Site. see **Meter Specific Instructions**
5. Confirm that Pulses are being counted
Done.

Optional Desktop Simulation

Tracking can be tested at your desk without any other hardware.
If Pulse is enabled, a relay "clicks" and can be heard when tracking and Pulsing.

Follow instructions as shown above

k(space)1.0	**ENTER**	to set Pulse as 1 Pulse per 1 Revolution
S	**ENTER**	to save Settings
x	**ENTER**	to stop function
r	**ENTER**	to delete last calibration
t	**ENTER**	to start tracking

Roll probe back and forth as shown in photo

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Configuring Communication
Data Logging

Unit Must be Assembled, with Sensor Probe Connected.

Logger records tracking data and may run in parallel with: MQTT, Modbus TCP and RTU, HTTP Publish, Pulse

Before Setting Data Logger
A) To Log in Volume (not revs): Calculate and Input **K-factor** in **Tracking Menu**. (See **Meter Specific Instructions**)
Use Desk Top Simulation pg 10, or pre-test on a meter, to become familiar with this feature before deploying.

On Command Window
B) To Set Time: Logged Data Time Stamped with Date and 24-hour clock time

Z	**ENTER**	to go to Maintenance Menu
t(space)yyyy:mm:ddThh:mm:ss	**ENTER**	to set time (ex: t 2021:02:28**T**05:46:00)
b	**ENTER**	to confirm date and time.

<u>**IMPORTANT: Date / Time setting lost if battery discharges. ~3 – 6 hours if fully charged.**</u>

C) To Configure Other Features

T	**ENTER**	to go to Tracking Menu
+	**ENTER**	to expand the Tracking Menu

D) To Log Volume or Revs   (change the display to Volume or Revolutions)

z(space)v	**ENTER**	to log flow volume. ****Volume logging requires K-factor entry into Tracking Menu****
z(space)r	**ENTER**	to log revolutions

E) To Log Volume with Units Noted (gal, ft3, m3)

v(space)ft3	**ENTER**	Options are: v(space)gal v(space)ft3 v(space)m3

F) To Log at a Different Rate (min = 300 sec or 5 minutes., max = 6000 sec or 100 minutes)

b(space)xxx	**ENTER**	xxx = the # of seconds of desired logging rate (ex. 15 min = b(space)900)

NOTE: The Logging Rate is designed to match the Tracking Display Rate in the Console, with this exception.
EXCEPTION: For all Display Rates of <5 min. (example: 5 sec), the Logging Rate will be 5 minutes.

G1) To START Logging

6	**ENTER**	to start logging to onboard memory (7 ENTER to stop logging)
S	**ENTER**	to Save your new configuration

Return to **Main Menu**. Log off.   Unplug USB from laptop and plug into wall power.   **Done.**

G2) To START Logging a Pre-Configured Device (no laptop on-site)
Install   (See **Meter Specific Instructions**: Installing without a Laptop)
Press Reset to START. (NOTE: Date / Time settings will be lost after 3 – 6 hours if power is lost)

Sample Logged Volume Data	**Sample Logged Revolution Data**
21/02/28 15:46:12:1419240 Vol=3.181 ft3	21/02/28 13:33:11:638139 Rev=255.11 rev
21/02/28 15:51:12:1424238 Vol=4.398 ft3	21/02/28 13:38:11:643139 Rev=766.05 rev

The Log Files
The data is logged together with system status reports on the SD Card.   First to the open Log file (ex:Log0),
until 400 records logged. Then to successive files (ex:Log1) up to Log500 max, before writing over Log0, etc.

Accessing Logged Data   **NOTE**: Log files are not accessible directly via the Command Window or Telnet.
Accessing Log Files Locally via SD Card: interrupts ongoing logging. See **pg. 14**
Accessing Log Files Remotely via Web Server: does not interrupt ongoing logging. See **pg. 15**

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**CONFIGURING
DATA TRANSMISSION**

The Configuration File
Editing OR Re-Using the Config.txt File

Directly Editing the Configuration File	*for advanced users

Copying a config.txt file (created using the Command Window) to additional sensor units is efficient and reduces field tasks. Directly editing the config.txt file, however, is for **advanced users**, and assumes a familiarity with the device and its operation.

WARNING: 2 identical MAC addresses CANNOT exist on the same sub-network; a risk when copying a Configuration from device to device. By deleting the MAC address line in Config.txt, the unit will create a unique MAC address.

1. Access the **Config.txt**. Save to laptop*
- Locally   via **SD Card** (see **pg. 14**)
- Remotely via **Web-Server** (see **pg. 15**)

2. Edit if necessary and **Save**

3. Upload back to same or other devices
- h. Locally   via **SD Card** (see **pg. 14**)
- i. Remotely via **Web-Server** (see **pg. 15**)

EXPLANATION	CONFIG.TXT FILE
k-factor = meter size in revs / (unit volume)	k = 60.000 #k factor
If DHCP: set as shown. If Static IP: enter address.	ip = 0.0.0.0 #device IP
If DHCP: set as shown. If Static IP: enter address.	gw = 0.0.0.0 #gw IP
If DHCP: set as shown. If Static IP: enter address.	nm = 0.0.0.0 #Netmask
If DNS = Gateway: set as shown. Otherwise change.	dns = 0.0.0.0 #Primary DNS Server IP
ADVANCED USERS	dns2 = 0.0.0.0 #Secondary DNS Server IP
Auto track at Powerup 0=disable 1=enable=default	auto = 1 #Start on power up (Tracking)
MQTT / HTTP. Broker / Server URL. Contact VV if MQTT	surl = m10.cloudmqtt.com #Broker URL
MQTT / HTTP. Broker / Server Port. Contact VV if MQTT	sport = 13730 #Broker Port
MQTT ONLY. Default shown. Contact VV if MQTT	pw = yQdP0kOWjBP7 #Broker Password
MQTT / HTTP. Broker / Resource PHP Contact VV if MQTT	user = vswzidgt #Broker user name
PULSE ONLY. Pulse K-factor = revs per Pulse ≥ 1.0	pk = 300.000 #pulse k factor
MODBUS RTU ONLY Slave=ID. Master=internal ID	mbid = 1 #Modbus RTU id
MODBUS TCP enable=1=def. (=0 if RTU Slv, =1 if RTU Mstr)	modbus_tcp = 1 #enable modbus tcp
HTTP Publish ONLY. 0=disable=default 1=enable.	http_pub = 0 #enable http publications
MQTT ONLY. 0=disable=default 1=enable	mqtt = 0 #enable MQTT
MQTT / HTTP. Data publication rate in seconds.	mqttPer = 10 #MQTT publication rate
PULSE ONLY. 0=disable=default 1=enable.	pulse = 0 #enable pulse
PULSE ONLY. Pulse width in msec (10 - 100)	pwdt = 10 #minimum pulse width
MQTT / HTTP. Token / Pub Name. Contact VV if MQTT.	name = user1 #MQTT Publication name
ADMIN ONLY. Do not change	state = track #the starting state of the device if auto=1
ADMIN ONLY. Do not change	log = 3 #0=all messages, 3=only very important messages
ADMIN ONLY. Do not change	battery = 5800 #standard battery=5800ma-Hr
DISPLAY & DATA LOGGER Rate in seconds (default = 5)	drate = 5 #Display and logging rate (sec).
DISPLAY & DATA LOGGER Type: 0=Revs=default 1=Vol	r/v = 0 #0 = revolutions, 1=revolutions/k.
DATA LOGGER ONLY. 0=not Log=default 1=Log	ltrack = 0 #0=don't log tracking data, 1 = log tracking data.
MAC Address supplied automatically, or edit	eMac = 4E:00:3F:31:38:51 #first byte should be 02 unless there
WEB SERVER ONLY. 0=disable 1=enable=default	Web = 1 #0 = disable web server, 1 = enable web server.
UNITS of Measure chosen. ft3=default	units = ft3#Unit of measure for k factor (gal, ft3, m3, rev
WEB SERVER ONLY. TCP-IP Port. default=80	webPort = 80 #port number for web server.
TELNET ONLY. TCP-IP Port. default=23	telnetPort = 23 #port number for web server.
TELNET ONLY. 0=Telnet enable=default 1=disable	telnetDisabled = 0 #0=enabled, 1=disabled.
MODBUS TCP ONLY. TCP-IP Port. default=502	modbusPort = 502 #port number for web server.
TRACKING Boost. 0=Boost=default 1=disable	sensorAmplitude=0 #0 for low signal levels, 1 for high levels
ADVANCED USERS	wl_ip = 0.0.0.0 #White List IP
ADVANCED USERS	wl_mask = 0.0.0.0 #White List Mask
MODBUS RTU ONLY: Baud rate default=38,400	rtu_baud=38400
MODBUS RTU ONLY: Stop bits. 1=default or 2	rtu_stop=1 #1 or 2
MODBUS RTU ONLY: Parity default=None	rtu_parity=0 #0=none, 1=even, 2=odd
MODBUS RTU ONLY. RTU Slv=1+TCP=0 RTU Mstr=1+TCP=1	modbus_rtu=0 #0=disabled, 1=enabled
Min/Max/Inst Flow Integrate Period s=def=1 sec m=1 min	flowcalc=s #s=second, m=minute

The enabling of Modbus RTU may require the enabling of Modbus TCP

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CONFIGURING
DATA TRANSMISSION

Accessing Files
Locally: via SD Card

Requirements

- Philips screwdriver
- PC that accepts micro-SD Cards OR SD Card Adaptors
- SD Card Adapter (if your PC requires)

1. Remove SD Card Carefully from Card Holder

htdocs	*Required folder*
CONFIG.TXT	*Required file*
LOG0.TXT	
STKDMP.TXT	*Fault Diagnostics*

- *Do not change or add to htdocs folder*
- *config.txt is a required file and file name*
- *Other files may be deleted.*

1. Slide Card holder   2. Lift SD Card holder up   3. Insert into Adaptor into PC   4. File Directory

2. IMPORTANT: DO NOT Remove Files from, OR Add Files to, the *htdocs* Folder

Configuration File
The sensor's operating configuration
- **Copy config.txt file to laptop**
- **Make changes if required (pg 13)**
- **Drop onto SD Card top directory.**

Log Files
Activity history and Data Logger files
- **View or Save to Laptop**
- **Optional: Can Delete Log Files**

Firmware Upgrade Files
Upgrading Unit Features
- **Receive 2 files from Vata Verks**
- **Save to laptop**
- **Drop onto SD Card top directory.**

3. Re-insert SD card into device <u>carefully</u>, and <u>gently</u> slide closed.

4. Reset Device (see below)

a. **Reset Option A: Soft Reset** (saves calibration / tracking count)
NOTE: Firmware Upgrades can result in temporary loss of calibration
and tracking count. Unit will auto-calibrate, track and communicate with flow.

Z	**ENTER**	to enter Maintenance Menu
R	**ENTER**	to Reset
S	**ENTER**	to Save

b. **Reset Option B: Hard Reset** (deletes calibration / tracking count)
- Use paper clip to depress **reset button (in circle above)**
- LEDs will blink off when successful
- *Unit will auto-calibrate, track and communicate with flow.*

Copying Config to 2nd Sensor

1) The Mac address is copied with the Configuration, but a network may not have duplicate MAC addresses.   See pg 13 top

2) Date and Time if required, must be entered separately.
See: pg 11 B).

Accessing Files
### Remotely: via Web Server

Requirements

- Unit must be accessible via local network (or VPN) over Ethernet
- Device IP address must be known or discoverable (see **pg. 7**)
- Username and Password must be known (factory default: **admin, admin**)
- Web Access must be enabled (factory default) (see Maintenance Menu)

1. Remotely Access via Web Access
- a. **Recommended Browser:** Chrome
- b. Enter **IP Address** into web browser. Sign in prompt appears
- c. Enter **Username** and **Password**
  Trouble Shooting 1: No Sign-in Prompt: change browsers.
  Trouble Shooting 2: No Sign-in Prompt: Use Telnet to confirm web access is enabled & IP Address
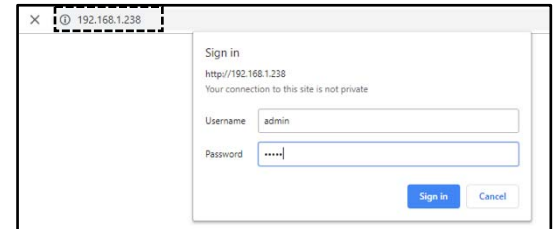
2. IMPORTANT: DO NOT Remove Files from, OR Add Files to, the *htdocs* Folder

| **Configuration File** *The sensor's operating configuration* • Click: **Config.txt** • Click: **Get Files.** • Save to Laptop. Edit if required. pg 13	**Log Files** *Activity history and Data Logger files* • Click: **Log#.TXT** file • To Download: **Get Files** • To Delete Logs: **Delete Files**	**Firmware Upgrade Files** *Upgrading Unit Features* • Receive 2 files from Vata Verks • Save to Laptop

3. To Upload Files: Config.txt OR Firmware Upgrade files
- a. Click **FILES**
- b. Click **UPLOAD FILE**
- c. Click **Browse**
- d. Choose **the file** from your laptop
  *Note: DO NOT CHANGE FILE NAMES
  Upload takes a minute. If Unsuccessful, Try again.
- e. If Firmware Upgrade: Repeat above for 2nd file.
  NOTE: Firmware Upgrades may result
  in temporary loss of calibration and loss of tracking count.

4. Reset is Required to Activate New Configuration or Firmware
- f. Click **OTHER**
- g. Click **RESET**: Upgrade and Reboot proceeds.
  (calibration and tracking count are saved through reset)
- h. If Firmware Upgrade: Click **Get Info** to confirm version.
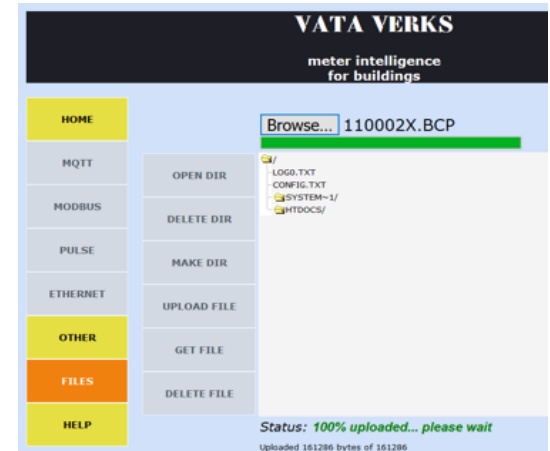
Set Date and Time
Used with HTTP, MQTT, Data Logger
a. Click **Set Time**
b. Click **Get Info** to confirm
NOTE: Sensor "Board Time" will be Universal Time UTC/GMT
NOTE: Time setting is lost after 3 – 6 hours without wall power