CAMPBELL SCIENTIFIC®

PVS5120

Portable
Water Samplers

Time-Based Control
and SDI-12 Control
Options

PVS5120C Shown.
Quick Deploy Guide PN 31278 1/16

Info Link

IMPORTANT NOTE: *This Quick Deploy Guide is a general reference guide to give the installer an overview of the steps required to make this system operational. The Owner's Manual is the definitive source for detailed installation instructions and information.*

⚠ Caution!

- When sampling hydrocarbons, grease, oil, etc., regular cleaning of the metering chamber, volume control tube, liquid detect/conductivity rod, and intake flow tubing is essential for continuous successful sampling.

- Placing the end of the intake tubing directly on sand and gravel beds can result in unrepresentatively high sediment loads being collected.   If a strainer is not used, gravel and sand may lodge in and plug the intake tube, metering chamber, and sampler distribution body (discrete sampler only).

- Connecting the battery cables improperly will cause the PVS5120 fuses to blow in order to protect the unit. Replace them with the same rated fuses as the originals. (28314- 5A, 28315-10A)

- Before deploying, check all connections, intake tubing, vacuum tubing, and the meter chamber cover for proper tightness and seating to prevent air leakage.

- Exercise proper lifting techniques when lifting this product.

- Damages caused by freezing conditions will not be covered by the warranty.

- When the PVS5120 is being stored for periods of time, disconnect the battery to reduce discharge over time.

Figure 1A - PVS5120D

Labels: Nuts To Adjust Volume Control Tube, Intake Hose Connection, Wiring, Top Handle, Liquid Detect / Conductivity Rod, Enclosure, Float Valve Barrier, T-Bar, Fuse, Retaining Plate, Battery, Sample Bottles, Metering Chamber, Volume Control Tube, Folding Handles, VSC100 Controller, Control Panel, Clasp, 1L Base, 500 mL Base, Bottle Notch Guide, Intake Hose, Sinker (Optional Strainer)

Figure 1B - USB Cable	Figure 1C - Control Cable	Figure 1D - Power Cable

Introduction: This guide provides the steps to setup and run in two common deployments: A) time based control (no datalogger needed) and B)SDI-12 control with a datalogger.

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1 Required Equipment

- PVS5120 (top, control section, base with bottles)
- 7/8" wrench (adjusting rods)
- 9/16" wrench (adjusting rods)
- 5/32" Allen wrench (adjusting rods)
- Small flat head screw driver (wiring to datalogger)
- USB cable (connecting to VSC100)
- Control cable (connects datalogger to sampler)
- 12V Battery
- External power cable (only if using an external battery)
- Datalogger with its own power supply, protected in an enclosure if necessary
- 3/8" hose clamp to connect intake hose to the sampler
- Laptop computer with *Device Configuration Utility* (*DevConfig* 2.09 or higher)
- 1/4" nut driver (to tighten hose clamps)

2 Physical Deployment

Refer to Figure 1A.

1. Loosen the brass nut to set the volume control tube to the approximate volume required for collection by aligning the base of the rod with the graduated marking on the metering chamber. It is best to collect this volume at least once to make sure it matches expectations. If necessary, adjust the tube up or down to obtain the desired collection volume.
2. Set the height of the conductivity rod. The bottom of the conductivity rod must be higher in the metering chamber than the volume control tube (at least 1/2"), but below the bottom of the float valve barrier.
3. Connect the positive lead to the top of the conductivity rod (yellow cap).
4. Connect the battery.
   - If using an internal battery, place it in the mount and connect the red and black leads to the matching terminals.
   - If using an external battery, make sure the external power cable (Fig. 1D) is stripped and the correct leads are in place to connect to the battery. Connect the external power cable to the front of the sampler (Fig. 2).
   - Connect the yellow caps around the fuse.

Figure 2
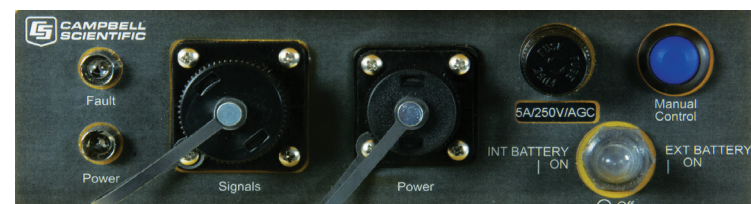
5. Turn on the sampler and set the 3-way switch on the control panel to the power source being used (Fig. 2). If powered correctly, the green indicator light (Fig. 2) will come on for several seconds, and then start blinking green once per second.
6. Connect the intake hose and tighten the hose clamp.
7. Put the sinker end of the intake hose into the water body to be sampled, ensuring at least 3 inch depth.
8. Run the Autodeploy routine by pushing and holding the manual control button until the sampler begins running (hold the button shown in Figs. 2

Figure 3

Manual Control Button	Function	Button-User Action
	Service	Press once
	Manual Sample	Press twice
	Auto Deploy	Press and hold, release when sampler runs

and 3 for approximately 5 seconds). The *Autodeploy* routine will set the purge and vacuum times based on the length of the hose and the change in height between the sampler and the water source. **Wait for the sampler to stop before proceeeding to Step 9.**

9. Remove the control section of the PVS5120 and empty the sample just collected.

10. Push the **Manual Control** button **ONCE** (Figs. 2 and 3). This will "service the sampler" and reset the sample count to 0.

Figure 4

11. a. Connect the USB cable (Fig. 1B) to the front of the sampler controller (VSC100) and the other end to the laptop USB port (Fig. 4). **Wait for Windows to install the driver before opening the software.**

    b. Open *DevConfig*. Select the **VSC100** Series under the *Sampler* option as shown in Figure 5A. Select the **Communication Port** option and find the correct COM port (Fig. 5B). Click **CONNECT** (Fig. 5C).

    c. Click on the **Clock** tab at the top. Next click on **Set Clock**. this will sync the sampler clock with the computer clock.

12. It is now time to configure the rest of the sampler settings. The sampler leaves the factory assuming it will be controlled via SDI-12, have 24 bottles in the base, and collect 1 sample per bottle. All of these general settings can be easily changed. Proceed to Section 3 (*Time-Based Control with NO Datalogger Interaction*) or Section 4 (*SDI-12 Control with a CR1000 Datalogger*), depending on how you want the sampler to operate.
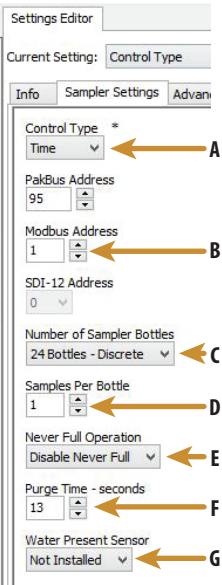
Figure 5

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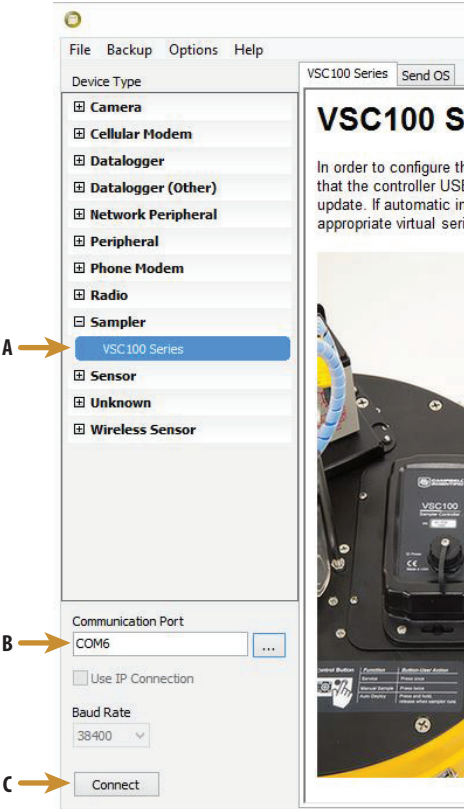
3 Scenario A: Time-Based Control With NO Datalogger

It is possible to run the sampler via time based control and still receive status feedback to a datalogger via Modbus or PakBus. Please see the manual for more information regarding this setup.

Figure 6

1. Once connected to the VSC100, click on the 'Sampler Settings' tab (Fig. 6).
   Fig. 6A. Set the Control Type to Time.
   Fig. 6B. Set the Modbus Address.
   Fig. 6C. Set the Number of Sampler Bottles.
   Fig. 6D Set the Samples Per Bottle.
   Fig. 6E. The Never Full Operation is a special configuration. It will come disabled, and should remain disabled for most users. See the manual for an explanation of Never Full.
   Fig. 6F. If the Autodeploy routine has been run, the Purge Time will already be set.
   Fig. 6G If a Water Present Sensor is present, click to install. This sensor is wired to the sampler control cable. Please see the manual for more information.

Figure 7

2. Click on the 'Advanced Sampler Settings' tab (Fig. 7).
   Fig. 7A. Set Sample Chamber-Pressure Relief. If collecting a sample volume > 450 mL, or with an intake hose longer than 50 ft, this feature will need to enabled .
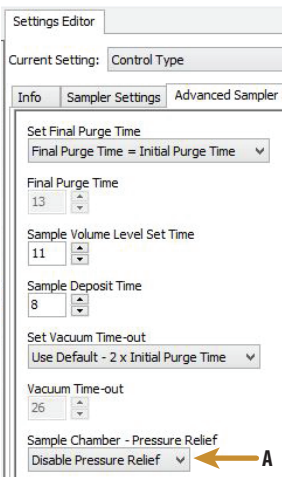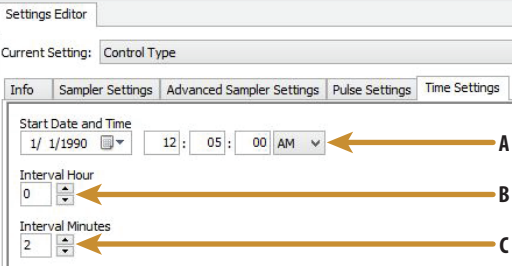

Figure 8

3. Click on the **Time Settings** tab (Fig. 8).
   Fig. 8A. Set the Start Date and Time. This is intended to be set to some future time. If left as a time in the past, the sampler will **immediately** begin sampling at the top of the next interval.
   Fig. 8B. Set Interval Hour.
   Fig. 8C. Set Interval Minutes.

4. Click **Apply**. It is a good idea to save the configuration file for future reference.

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4 Scenario B: SDI-12 Control With A CR1000 Datalogger

1. Click on the **Sampler Settings** tab (Fig. 9).
   Fig. 9A. Set the Control Type to SDI-12.
   Fig. 9B. Set the SDI-12 Address . This is the address of the sampler and will be referenced in the *CRBasic* program running on the datalogger. Possible address choices are 0-9, A-Z, a-z.
   Fig. 9C. Set the Number of Sampler Bottles.

   Fig. 9D. Set the Samples Per Bottle.
   Fig. 9E. The Never Full Operation is a special configuration and it will come disabled and should remain disabled for most users. See the manual for an explanation of Never Full.
   Fig. 9F. If the *Autodeploy* routine has been run, the Purge Time will already be set.
   Fig. 9G. If a Water Present Sensor is present, click to install. This sensor is wired to the sampler control cable (Fig 1C). Please see the manual for more information.

Figure 9
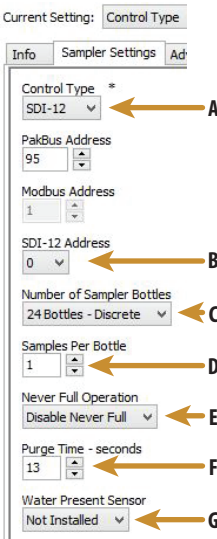
2. Click on the **Advanced Sampler Settings** tab (Fig. 7).
   A. Set Sample Chamber-Pressure Relief . If collecting a sample volume > 450 mL or using an intake hose longer than 50 ft, this feature must be enabled.

3. Click **Apply**. It is a good idea to save the configuration file for future reference.

4. Connect the sampler cable (Fig. 1C) to the front of the sampler (Fig. 2). Next, wire the cable to the CR1000.

Wire Color	Port on CR1000
Green - SDI-12	Tx slot of a COM port (C1, C3, C5, or C7)
Purple or Gray	Ground

5. The example *CRBasic* program available at www.campbellsci.com/pvs5120c demonstrates how to control a sampler via SDI-12 with a CR1000. Many other programs are available at the Campbell Scientific website. There are multiple best management practices for programming the PVS5120. Please refer to the manual for this information.

6. Connect to the datalogger. The following steps assume a knowledge of how to set up a CR1000 and connect via a direct connection or remote connection. Please see the datalogger manual for more detailed instructions on connecting to a datalogger.
   A. From the *LoggerNet Connect* screen click on **Collect Now** to collect any data on the datalogger.
   B. From the *Connect* screen, click on the **Send** button. Browse to find the *CRBasic* program that controls the PVS5120 via SDI-12. Click **Open | Send**.
   C. Generic SDI-12 information: An **M!** command needs to be issued to trigger a sample. The address referenced in the command MUST match the SDI-12 address set in *DevConfig*. The PVS5120 does not support extended SDI-12 commands. Also, an array of 4 variables will need to be created to hold the data returned after the **M!** command. The values returned are:
      1. Sample bottle #
      2. Sample number
      3. Response code: numeric code between 0-8 (see Table 1).
      4. Sampler battery voltage

Table 1

Numeric Response Code	Definition
0	No error
1	All samples complete
2	Low start battery (V<11.0V)
3	Low run battery (V<10.5V occurs after pumping has started)
4	Sampler vacuum timed out, no sample detected
5	Sample overflow detected (only if an overflow sensor is installed for stationary samplers)
6	No sample liquid detected (only if water detect sensor is installed)
7	Arm calibration error
8	Conductivity rod and sample tube are shorted