Technical Support Bulletin 2015-04	Firmware Upgrades for CF2-Based Samplers	May 27, 2015

Alert Level: INFORMATIONAL

Instruments: Sediment Traps, RAS, PPS, WTS-LV with CF2 Microcontroller

Software Versions: Persistor CF2 Microcontroller Versions

Hardware Version: N/A

Subject: Firmware Upgrades for CF2-Based Samplers

Summary: Instructions for using MotoCross to Upload Firmware for a CF2 -based McLane Sampler and Confirm sampler-specific Configuration settings.

Actions: Follow these instructions to perform a firmware upgrade for CF2-based Samplers.

Contact McLane (www.mclanelabs.com) with questions about making firmware or hardware configuration changes. After upgrading, the firmware must be configured to match the sensors installed on your specific system. Use the instrument-specific configuration sections in this document to complete the upgrade process.

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McLane Firmware Upgrade Instructions for Samplers

1 : Overview

These instructions are for upgrading sampler firmware for a Persistor CF2 microcontroller. The microcontroller and firmware version display at the top of all screens.

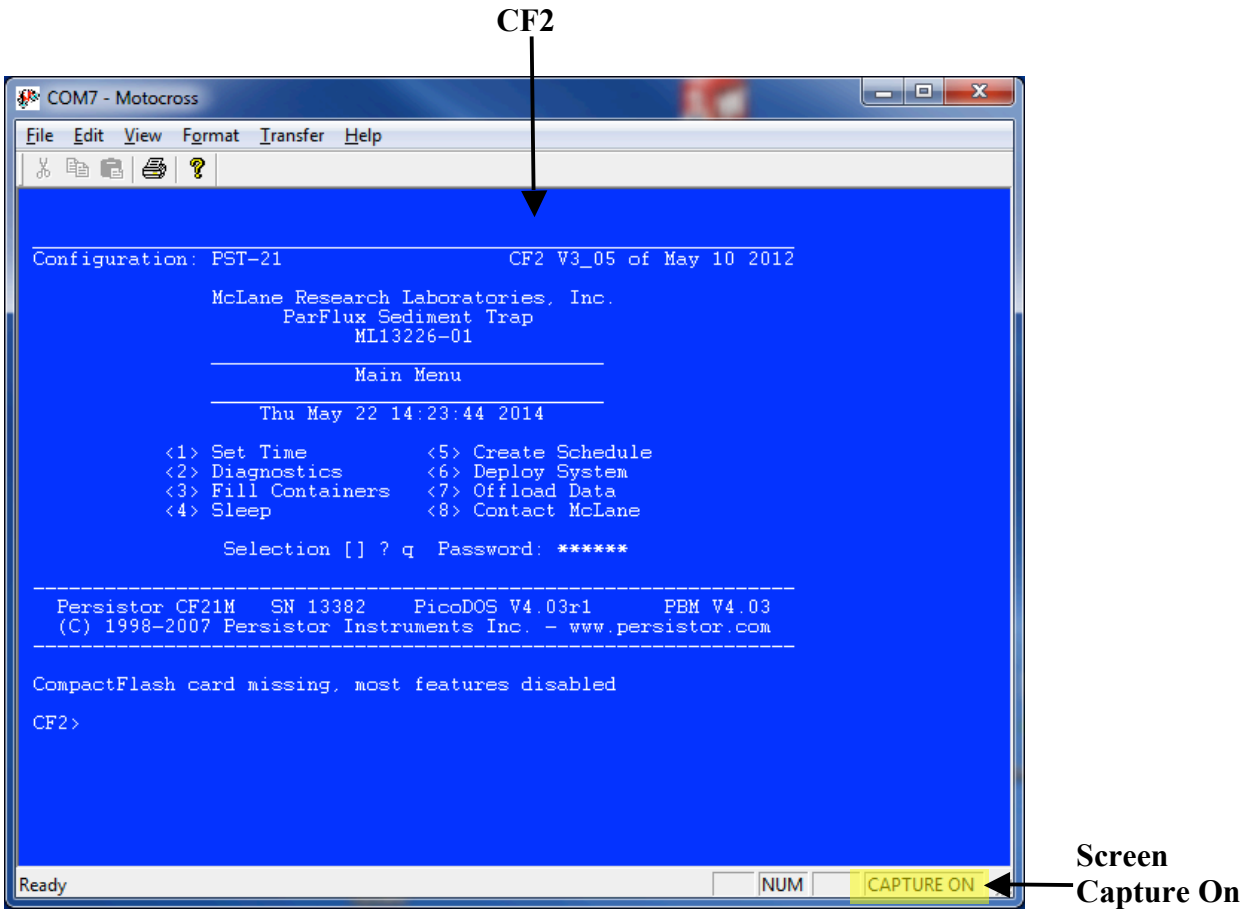

Figure 1-1: Microcontroller Version

After upgrading, the firmware must be configured to match the sampler hardware for your system. Contact McLane (www.mclanelabs.com) with questions about firmware or hardware configuration changes.

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1.1 : Persistor CF2 Microcontroller Firmware Upgrade

To upgrade sampler firmware for a CF2 -based McLane sampler complete the following steps:

1. Connect to the McLane instrument with Motocross.
2. From the Motocross Transfer Menu select 'Capture Text' and then select 'Start' to record the upgrade process to a text file. The Capture On flag displays in the lower right of the screen (Figure 1.1-1).

From your sampler-specific User Manual, refer to the instructions for Communicating with your McLane Instrument.

3. Type *Q* at the Main menu, then the password *MCLANE* to quit any running CF2 program.

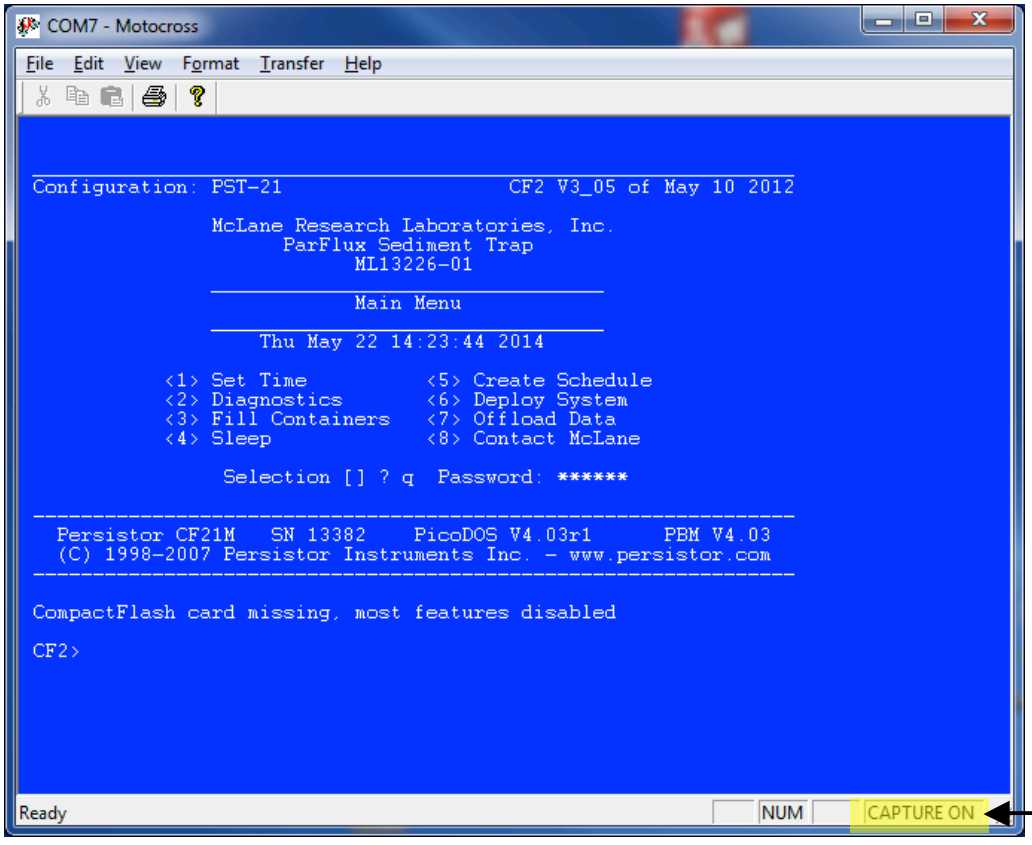

Figure 1.1-1: Access CF2 Microcontroller

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4. At the Motocross Menu select ‘Transfer’ (1.1-2).
5. Select ‘Load’ and a Windows file dialog box will open (1.1-3).

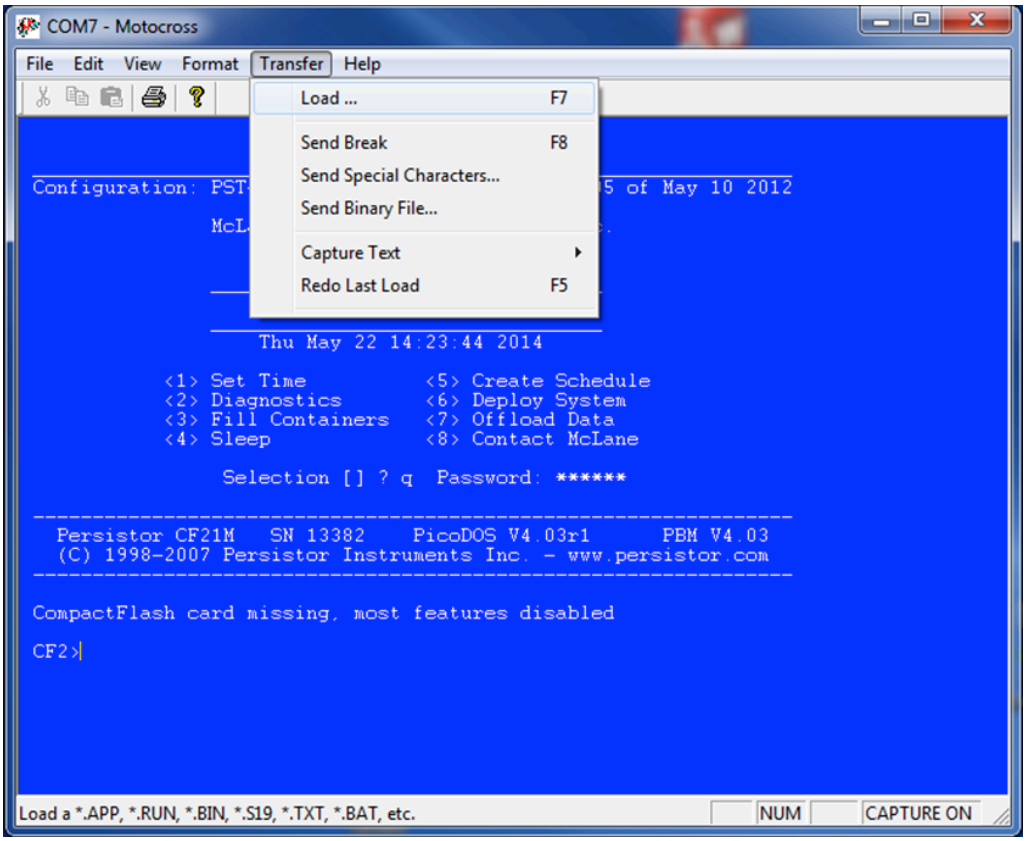

Figure 1.1-2: Load Record

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6. Navigate to the appropriate directory.

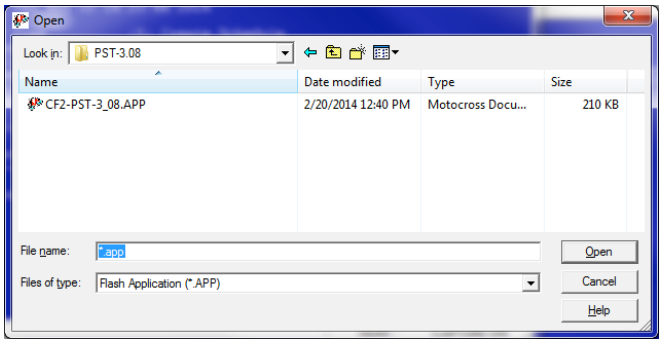

Figure 1.1-3: Selecting the APP File

7. Select the .APP file to load, and then press 'Open' to begin the application download.

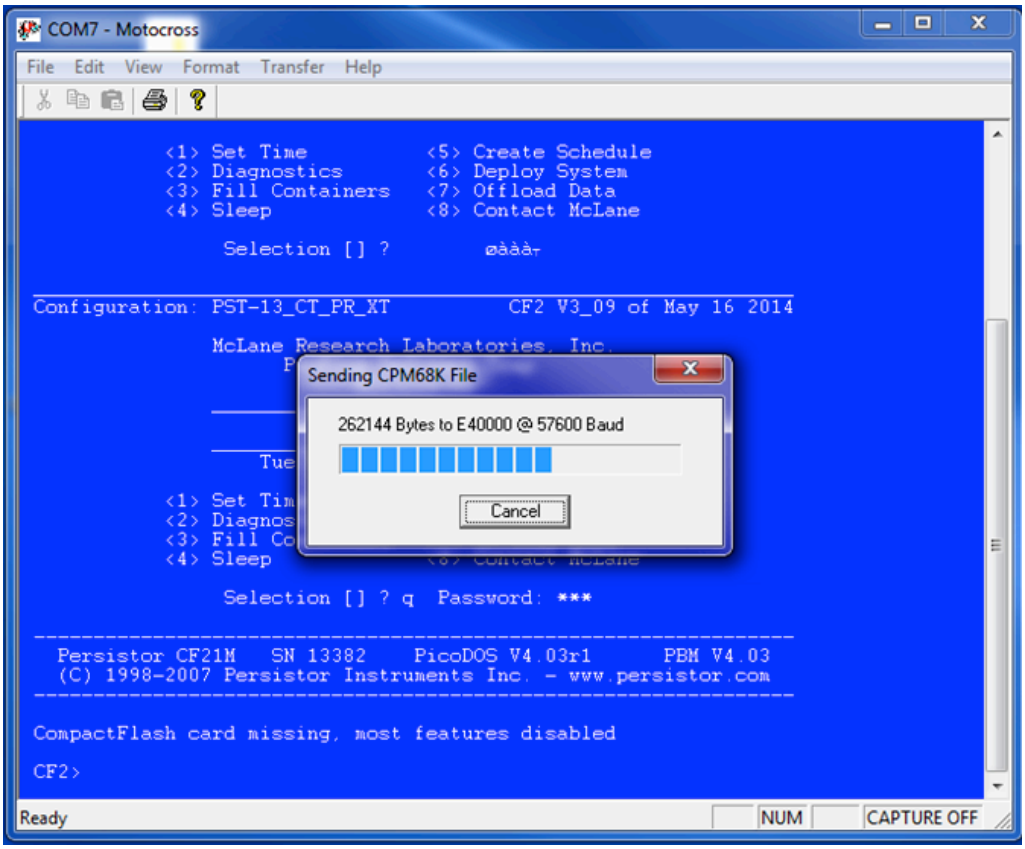

Figure 1.1-4: Application Download

When the download is finished, a screen similar to Figure 1.1-4 displays showing the specific addresses. Load sizes are program specific.

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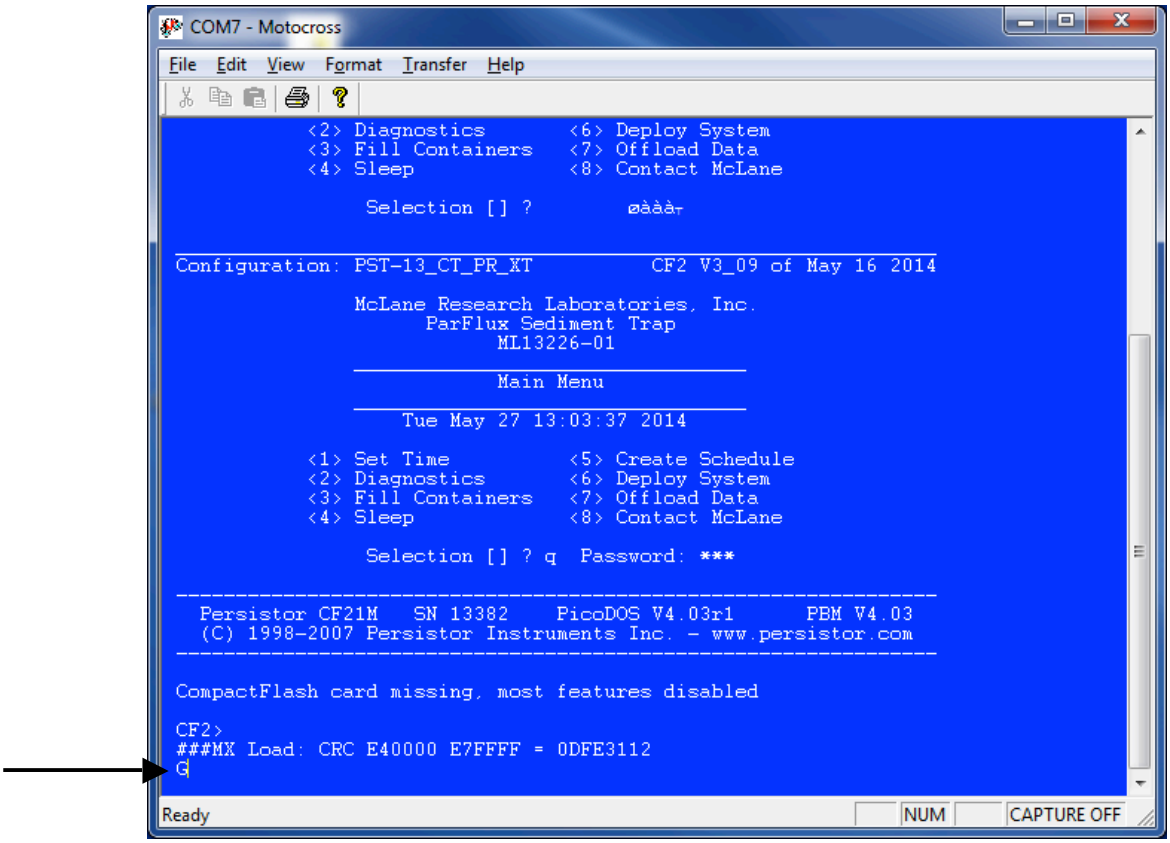

Figure 1.1-5: Application Download Complete

8. Press [Enter]. The program is burned to flash memory and begins to execute.
9. Type *G* to execute the firmware program and display the instrument-specific Main menu (Figure 1.1-5).

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The instrument-specific Main Menu detects that instrument configuration changes are needed. The example shown in Figure 1.1-6 is for a Sediment Trap.

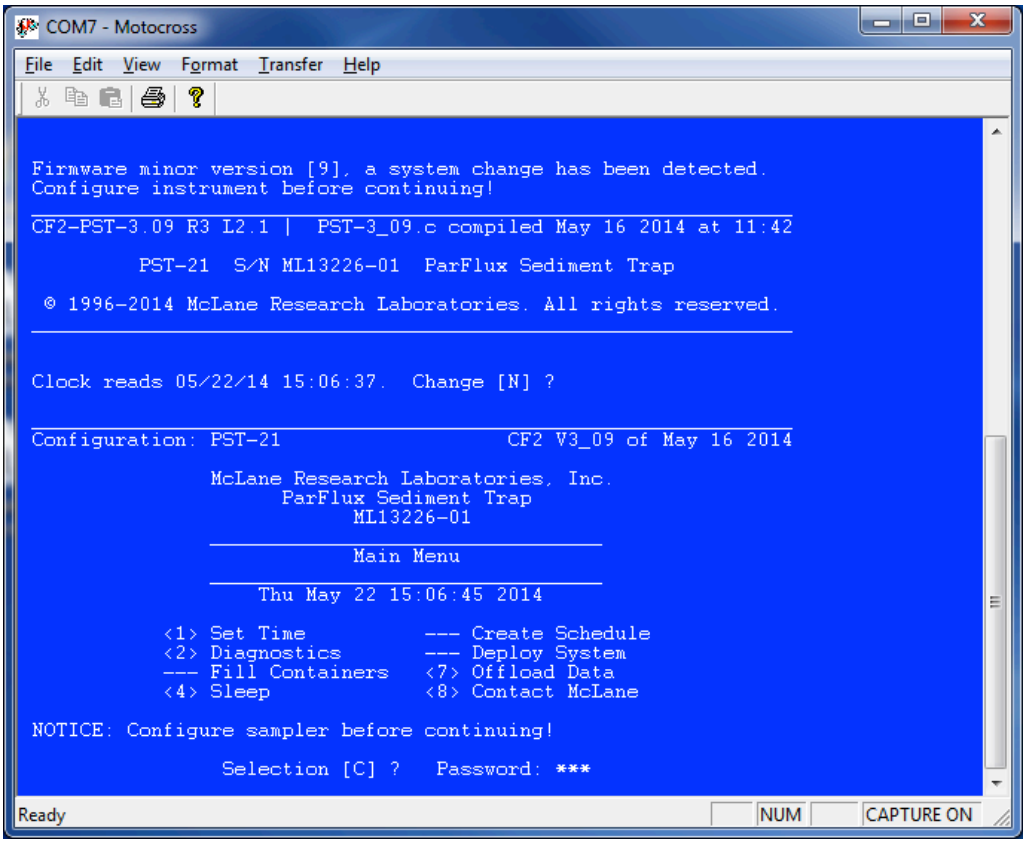

Figure 1.1-6: Application Download Complete

The firmware update for CF2 microcontrollers is now complete. If power is cycled, the same program remains resident and runs again from flash memory.

After upgrading, the firmware must be configured to match the sampler hardware for your system. Refer to the sampler-specific instructions that follow to complete the updgade. Contact McLane (www.mclanelabs.com) with questions about firmware or hardware configuration changes.

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2 : Overview

Confirming the Configuration settings is a best practices step to completing a firmware upgrade and/or hardware change (for example, installing a different WTS-LV pump head or adding a pressure sensor option to a Sediment Trap).

Instrument configurations are stored in non-volatile EEPROM. After a firmware installation, the EEPROM and current settings are compared. If EEPROM does not match the firmware configuration, you must accept or change the Configuration settings before proceeding.

These instructions are sampler-specific and support the CF2 microcontroller:

WTS-LV Configuration Steps – Section 3
Sediment Trap Configuration Steps – Section 4
RAS Configuration Steps – Section 5
PPS Configuration Steps – Section 6

For adaptive sampling firmware upgrades, refer to the Adaptive Sampling documentation included with your instrument. Adaptive Sampling requires a continuous RS-232 connection from the sampler to a computer. A command line interface and a set of commands are used to send and receive commands.

Be sure to use the steps that apply to your instrument. Contact McLane (www.mclanelabs.com) with questions about firmware upgrades or hardware configuration changes before performing these steps.

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3 : WTS-LV Configuration Steps

1. To use the Configuration menu, type *c* from the Main menu and type the password *con*.

```
_____________________________________________________________________
Configuration: LV-08M                    CF2 V2_07 of Jan 15 2015

               McLane Research Laboratories, Inc.
                      Large Volume Sampler
                           ML12345-01

                      _____________________________
                                Main Menu

                      _____________________________
                          Fri Mar 13 08:32:32 2015

          <1> Set Time           <5> Deploy System
          <2> Diagnostics        <6> Offload Data
          <3> Manual Operation   <7> Contacting McLane
          <4> Sleep              <C> Configure

Firmware major version [2] does not match EEPROM setting
Configure instrument before continuing!

          Selection ? c  Password: con
```

Figure 3-1: Main Menu

```
_____________________________________________________________________
Configuration: LV-04M_TR                 CF2 V2_07 of Jan 15 2015
                    _____________________________
                             Configuration Menu

                    _____________________________
                        Fri Mar 13 08:32:54 2015

          <A> Pressure Sensor                [No]
          <B> Pump                           [Maxon   4 L/Min.]
          <C> Rechargeable Battery           [No]
          <D> Trigger                        [Enabled]

          <X> Save & Exit          <^C> Cancel & Exit

          Selection [ ] ?
```

Figure 3-2: Configuration Menu

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2. From the Configuration menu type a value to change a configuration setting. An example of changing from an 8L/min to a 4L/min pump head is shown in Figure 3-3

```
          Selection [ ] ? b
Current value of pump type: M
Enter pump type [Maxon|Pittman|Gearhead] [M] ? m
Current value of pump capacity: 8
Enter pump capacity [4|8|30 L/min] (4-30) [8] ? 4
Changing pump type from "Maxon  8LPM" to "Maxon  4LPM"
```

Figure 3-3: Changing the Pump Head Configuration

3. You will then be returned to the Main menu. Type *x* at the prompt to save the changes to EEPROM.
4. The configuration parameters are now stored and configuration is complete parameters will be retained in EEPROM when the battery is disconnected from the system.

```
Configuration: LV-08M_TR                CF2 V2_07 of Jan 15 2015

                    Configuration Menu
                Fri Mar 13 08:32:54 2015

          <A> Pressure Sensor               [No]
          <B> Pump                          [Maxon   4 L/Min.]
          <C> Rechargeable Battery          [No]
          <D> Trigger                       [Enabled]

          <X> Save & Exit          <^C> Cancel & Exit
          Selection [ ] ? x
          Configuration successfully stored
```

Figure 3-4: Saving the Configuration Change

The configuration must match the WTS-LV hardware. For example, setting the pump configuration for 4L/min requires the installation of a 4L/min pump head. Contact McLane if you are unsure of the hardware components you are adding.

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4 : Sediment Trap Configuration Steps

1. To use the Configuration menu, type *c* and type the password *con*.

```
Configuration: PST-21                    CF2 V3_10 of Jan 29 2015

               McLane Research Laboratories, Inc.
                     ParFlux Sediment Trap
                           ML12345-01
               _____________________________________
                           Main Menu
               _____________________________________
                   Thu Jan 29 11:42:52 2015

          <1> Set Time          <5> Create Schedule
          <2> Diagnostics       <6> Deploy System
          <3> Fill Containers   <7> Offload Data
          <4> Sleep             <8> Contact McLane
          <C> Configure

   NOTICE: Configure sampler before continuing!

                Selection [C] c   Password: con
```

Figure 4-1: Main Menu

2. From the Configuration menu, type a value to change the configuration setting.

```
Configuration: PST-21                    CF2 V3_09 of May 16 2014
               _____________________________________
                        Configuration Menu
               _____________________________________
                   Thu May 22 15:08:30 2014

          <A> Compass Tilt                  [No]
          <B> External Temperature Sensor   [No]
          <C> Pressure Sensor               [No]
          <D> Number Of Cups                [21]

          <X> Save & Exit          <^C> Cancel & Exit

          Selection [ ] ? x

          Configuration successfully stored
```

Figure 4-2: Configuration Menu

3. Type *x* at the prompt to save the changes to EEPROM.

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You will then be returned to the Main menu. The configuration parameters are now stored and configuration is complete.

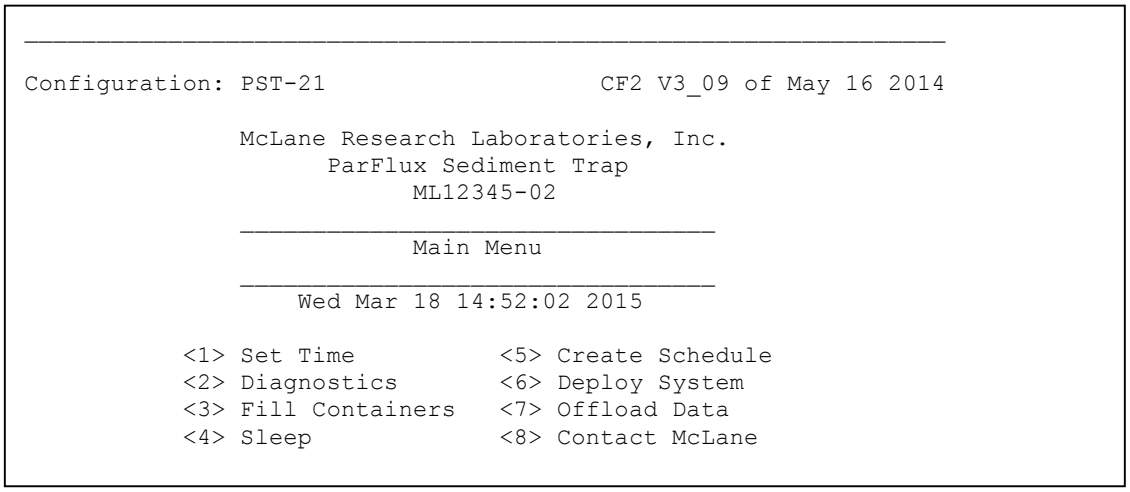

Figure 4-3: Main Menu – All Parameters Available for Selection

4. The configuration parameters will be retained in EEPROM when the battery is disconnected from the system.

The configuration must match the Sediment Trap hardware. For example, setting the number of cups to 21 is for use only with the 21 cup Sediment Trap model, and setting the number of cups to 13 is for use only with the 13 cup Sediment Trap model.

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5 : Remote Access Sampler (RAS) Configuration Steps

If new firmware is installed, the Configuration menu must be accessed and the configuration accepted or changed before selecting other options from the Main menu.

1. To use the Configuration menu, from the Main Menu type *c* and type the password *con*.

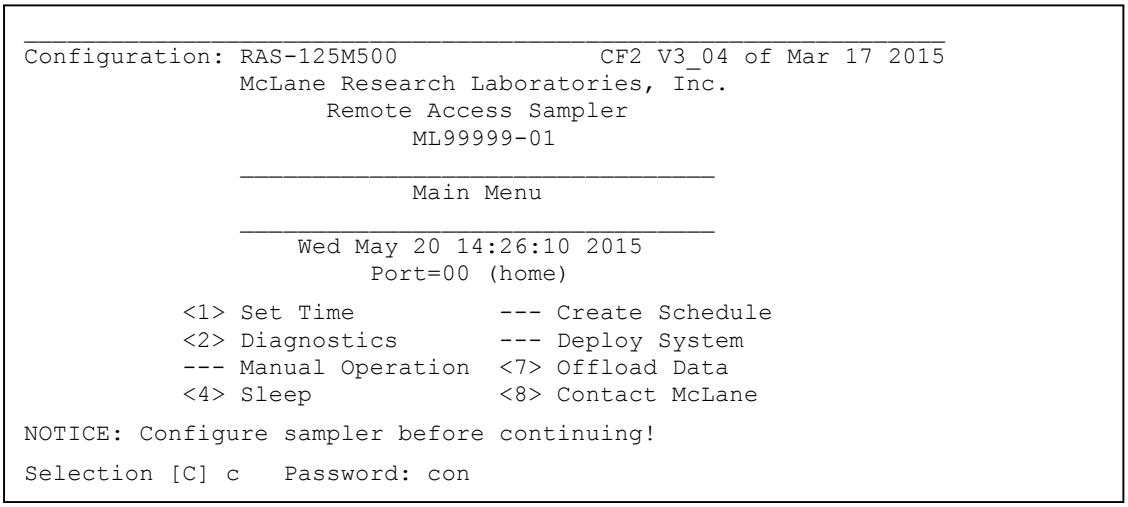

Figure 5-1: Main Menu

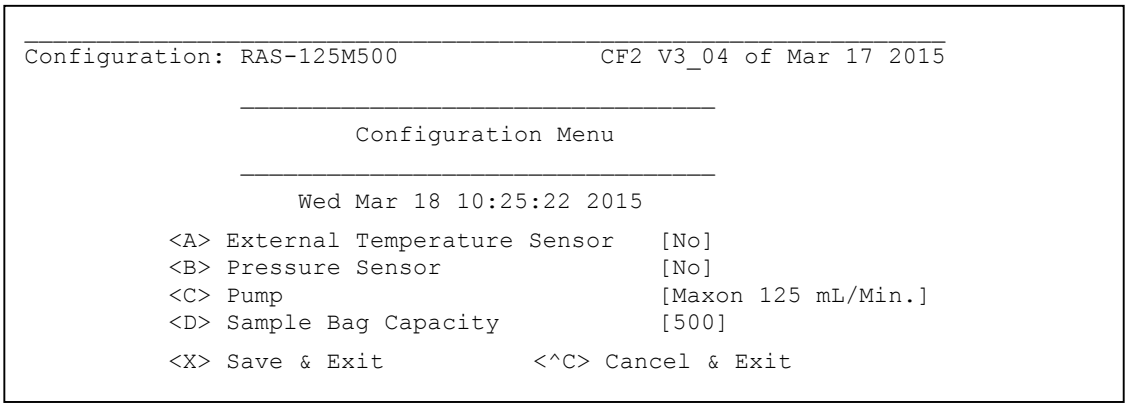

Figure 5-2: Configuration Menu

2. From the Configuration menu, type a value to change a configuration setting.
3. Type x at the prompt to save the changes to EEPROM. You can select not to update EEPROM by pressing [CTRL]-[C] which returns to the Main menu without saving changes.

The configuration must match the RAS hardware. For example, a sample bag capacity of 500 is for use only with the RAS-500 sampler and a sample bag capacity of 100 is for use only with the RAS-100 sampler.

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6 : Phytoplankton Sampler (PPS) Configuration Steps

If new firmware is installed, the Configuration menu must be accessed and the configuration accepted or changed before selecting other options from the Main menu.

1. To use the Configuration menu, from the Main menu type *c* and type the password *con*.

```
_____________________________________________________________________
Configuration: WTS-125M                CF2 V2_04 of Aug 29 2014
               McLane Research Laboratories, Inc.
                     Water Transfer System
                           ML12345-01

                     _____________________________
                                Main Menu

                     _____________________________
                         Thu Mar 12 09:37:31 2015
                                   Port 00

          <1> Set Time           <5> Create Schedule
          <2> Diagnostics        <6> Deploy System
          <3> Manual Operation   <7> Offload Data
          <4> Sleep              <8> Contacting McLane

          <C> Configure

           Selection [] ? c  Password: con
```

Figure 6-1: Main Menu

```
_____________________________________________________________________
Configuration: WTS-125M                CF2 V2_04 of Aug 29 2014
                     _____________________________
                                Configuration

                     _____________________________
                         Thu Mar 12 09:37:40 2015

          <1>     50ml pump: No
          <2>    125ml pump: Yes
          <3>    250ml pump: No
          <M>   Maxon motor: Yes
          <P> Pittman motor: No
          <L>     RX/TX LED: No

<X> Save & Exit    <^C> Cancel & Exit
```

Figure 6-2: Configuration Menu

2. From the Configuration menu, type a value to change a configuration setting.
3. Type *x* at the prompt to save the changes to EEPROM. Pressing [CTRL]-[C] which returns to the Main menu without saving changes.

The configuration must match the PPS hardware. For example, setting the configuration to the 50mL/min pump requires installation of a 50mL/min pump option on the PPS.

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