

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.

CF2			
P COM7 - Motocross	0	_ D X	
File Edit View Format Iransfer Help Image:	10 2012		
Ready	NUM		Screen —Capture On

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.



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.

COM7 - Motocross				
<u>F</u> ile <u>E</u> dit <u>V</u> iew F <u>o</u> rmat <u>T</u> ransfer <u>H</u> elp				
X 🖻 🖻 🎒 💡				
	OTO NO OF 6 1	10.0010		
Configuration: P51-21	CF2 V3_05 OF M	ay 10 2012		
McLane Research Laborat ParFlux Sediment ML13226-01	ories, Inc. Trap			
Main Menu				
Thu May 22 14:23:44	2014			
<1> Set Time <5> 0	Create Schedule			
<2> Diagnostics <6> I <3> Fill Containers <7> (eploy System			
<4> Sleep <8> C	Contact McLane			
Selection [] ? q Pass	sword: *****			
 Persistor CF21M SN 13382 PicoD0 (C) 1998-2007 Persistor Instruments 	05 V4.03r1 P Inc www.persi	BM V4.03 stor.com		
CompactFlash card missing, most featur	es disabled			
CF2>				
				Screen
leauy			CAPTORE ON	Capture (



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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).

🖗 COM7 - Motocross	The second second		0	- • ×
File Edit View Format T	ransfer Help			
) X 🖻 🖻 🎒 🤶	Load	F7		
Configuration: PST- McL-	Send Break Send Special Characters Send Binary File	F8	10 2012	
	Capture Text	• •		
	Redo Last Load	F5		
	bu Mor 22 14-22-44 2	014		
1 .1. C-1. T	nu nay 22 14.25.44 2			
<l> Set 1 <2> Diagn</l>	ostics <6> Dep.	ate Schedule loy System		
<pre><3> Fill <4> Sleep</pre>	Containers <7> Off. <8> Con	load Data tact McLane		
Sele	ction [] ? q Passwo:	rd: *****		
Persistor CF21M (C) 1998-2007 Pers	SN 13382 PicoDOS ' istor Instruments Inc	V4.03r1 PBM	V4.03 or.com	
CompactFlash card mi	ssing, most features	disabled		
CF2>				
Load a * APP * RUN * BIN * S19) *.TXT. *.BAT. etc.		NUM	

Figure 1.1-2: Load Record



6. Navigate to the appropriate directory.

🖗 Open	-		X
Look in: 🚺 PST-3.08	▼ ⇔ 🗈 💣 💷 ▼		
Name	Date modified	Туре	Size
& CF2-PST-3_08.APP	2/20/2014 12:40 PM	Motocross Docu	210 KB
File name:			Open
Files of type: Flash Application (*.APP)		•	Cancel
			Help

Figure 1.1-3: Selecting the APP File

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

K COM7 - Motocross	- • ×
File Edit View Format Transfer Help	
<1> Set Time <2> Diagnostics <3> Fill Containers <4> Sleep Selection [] ?	<5> Create Schedule <6> Deploy System <7> Offload Data <8> Contact McLane gààà ,
Configuration: PST-13_CT_PR_XT	CF2 V3_09 of May 16 2014
McLane Research La Sending CPM6 262144 Byte Tue <1> Set Tim <2> Diagnos <3> Fill Co <4> Sleep Selection [] ? q Persistor CF21M SN 13382 F (C) 1998-2007 Persistor Instru	E Password: ***
 CompactFlash card missing, most f CF2>	eatures disabled
Ready	NUM CAPTURE OFF

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.

COM7 - Motocross			111	
	rmat <u>I</u> ranster <u>H</u> eip			
(2) (3) (4)	Diagnostics Fill Containers Sleep	<pre><6> Deploy Syste <7> Offload Data <8> Contact McLa</pre>	m ne	
	Selection [] ?	øààà _t		
Configuration:	PST-13_CT_PR_XT	CF2 V3_09	of May 16 2014	
	McLane Research ParFlux Se ML13	Laboratories, Inc. diment Trap 226-01		
	Main	Menu		
	Tue May 27 1	3:03:37 2014		
<1> <2> <3> <4>	Set Time Diagnostics Fill Containers Sleep	<5> Create Sched <6> Deploy Syste <7> Offload Data <8> Contact McLa	ule m ne	
	Selection [] ?	q Password: ***		
Persistor CF (C) 1998-200	21M SN 13382 7 Persistor Instr	PicoDOS V4.03r1 ruments Inc www.	PBM V4.03 persistor.com	
CompactFlash c	ard missing, most	features disabled		

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).



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.

Provide the second seco	- • ×
<u>File Edit View Format Transfer H</u> elp	
X 🖻 🖻 🎒 🦻	
	×
Firmware minor version [9], a system change has been detected. Configure instrument before continuing!	
CF2-PST-3.09 R3 L2.1 PST-3_09.c compiled May 16 2014 at 11:42	
PST-21 S/N ML13226-01 ParFlux Sediment Trap	
© 1996-2014 McLane Research Laboratories. All rights reserved.	
Clock reads 05/22/14 15:06:37. Change [N] ?	
Configuration: PST-21 CF2 V3_09 of May 16 2014	
McLane Research Laboratories, Inc. ParFlux Sediment Trap ML13226-01	
Main Menu	
Thu May 22 15:06:45 2014	E
<pre><1> Set Time Create Schedule <2> Diagnostics Deploy System Fill Containers <7> Offload Data <4> Sleep <8> Contact McLane</pre>	
NOTICE: Configure sampler before continuing!	
Selection [C] ? Password: ***	
Ready	CAPTURE ON

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.



McLane Post-Upgrade Configuration Instructions - Samplers

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 Large Vol ML12	Laboratories, Inc. ume Sampler 345-01
	Main	Menu
	Fri Mar 13 0	8:32:32 2015
<1> 5 <2> 1 <3> N <4> 5	Set Time Diagnostics Manual Operation Sleep	<5> Deploy System <6> Offload Data <7> Contacting McLane <c> Configure</c>
Firmware major Configure inst	version [2] does rument before con	not match EEPROM setting
Selec	ction ? c Passwo	ord: con

Figure 3-1: Main Menu

Configuration:	LV-04M_TR	CF2	V2_07 o	f Jan 15 201
	Configuratio	n Menu		
	Fri Mar 13 08:32	:54 2015		
<a>	Pressure Sensor		[No]	
	Pump		[Maxon	4 L/Min.]
<c></c>	Rechargeable Battery		[No]	
<d></d>	Trigger		[Enable	d]
<x></x>	Save & Exit	<^C> Can	cel & Ex	it
Sele	ection [] ?			

Figure 3-2: Configuration Menu



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	1			
	Fri Mar 13 08:32:54 20	015			
<a> <c> <d></d></c>	Pressure Sensor Pump Rechargeable Battery Trigger		[No] [Maxon [No] [Enabled]	4 L/Min.]]	
<x> Sele Conf</x>	Save & Exit <^C> ction []? x iguration successfully stor	Can red	cel & Exi	t	

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.



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 L ParFlux Sed ML123	aboratories, Inc. iment Trap 45-01
	Main	Menu
	Thu Jan 29 11	:42:52 2015
<1> <2> <3> <4> <c></c>	Set Time Diagnostics Fill Containers Sleep Configure	<5> Create Schedule <6> Deploy System <7> Offload Data <8> Contact McLane
NOTICE: Con:	figure sampler bef	ore 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	16 201
	Configuratio	n Menu			
	Thu May 22 15:08	:30 2014			
<a>	Compass Tilt		[No]		
	External Temperature	Sensor	[No]		
<c></c>	Pressure Sensor		[No]		
<d></d>	Number Of Cups		[21]		
<x></x>	Save & Exit	<^C> Can	cel & H	Exit	
Sele	ction [] ? x				
Conf	iguration successfull	y stored			

Figure 4-2: Configuration Menu

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



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

PST-21	CF2 V3_09 of May 16 2014			
McLane Research I ParFlux Sec ML123	Laboratories, Inc. diment Trap 345-02			
Main Menu				
Wed Mar 18 14:52:02 2015				
Set Time	<5> Create Schedule			
Diagnostics	<6> Deploy System			
Fill Containers	<7> Offload Data			
	PST-21 McLane Research I ParFlux Sec ML123 Main Wed Mar 18 14 Set Time Diagnostics Fill Containers			

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*.

Configuration:	RAS-125M500	CF2 V3_04 of Mar 17 2015
	McLane Research L	aboratories, Inc.
	Remote Acce	ss Sampler
	ML999	99-01
	Main 1	Menu
	Wed May 20 14	:26:10 2015
	Port=00	(home)
<1>	Set Time	Create Schedule
<2>	Diagnostics	Deploy System
	Manual Operation	<7> Offload Data
<4>	Sleep	<8> Contact McLane
NOTICE: Config	ure sampler before	continuing!
Selection [C]	c Password: con	

Figure 5-1: Main Menu

Configuration:	RAS-125M500	CF2	V3_04 of Mar 17 2015
	Configuration M	enu	
	Wed Mar 18 10:25:22	2015	
<a>	External Temperature Sen	sor	[N0]
	Pressure Sensor		[No]
<c></c>	Pump		[Maxon 125 mL/Min.]
<d></d>	Sample Bag Capacity		[500]
<x></x>	Save & Exit <^C	:> Can	cel & Exit

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 McLane Research Water Tran	CF2 V2_04 of Aug 29 2014 Laboratories, Inc. sfer System
	ML12	345-01
	Main	Menu
	Thu Mar 12 0 Po	9:37:31 2015 rt 00
<1> <2> <3> <4>	Set Time Diagnostics Manual Operation Sleep	<5> Create Schedule <6> Deploy System <7> Offload Data <8> Contacting McLane
<c></c>	Configure	ssword, con

Figure 6-1: Main Menu

nfiguration:	WTS-125M	CF2 V2	_04 of Aug	g 29 2014
	Configuratior	1		
	Thu Mar 12 09:37:40	2015		
<1>	50ml pump: No			
<2>	125ml pump: Yes			
<3>	250ml pump: No			
<m></m>	Maxon motor: Yes			
<p></p>	Pittman motor: No			
<l></l>	RX/TX LED: No			

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.