# Summa canisters – air canister on airpointer

# Goal

The airpointer is an excellent tool to measure the ambient air quality on the standard pollution gases. Let the airpointer control the sampling of the ambient air into summa canisters enables a lot of new possibilities in the field on air quality measurement. Using the airpointer's "rules & action" system the sampling of the air can be controlled simple by time intervals but much nicer also by certain limits of air concentrations. Each canister change is labeled by the user in the software, when the user takes away the canister after a while, he can have a file with all sampling data, including the total amount of sampled gas and sample duration.

# Hardware

A board called ValveCtrl is situated in the lower, left corner of the airpointer close to the cable entry. This board is able to control up to 8 valves. The values should be 12V standard on/off types, but also 6V valves can be used (The maximum total current of the 6V valves need to be below 2A.) The valves are connected with 4 pin Molex Microfit connectors (a set of connectors is delivered with the unit).

Pin layout: pin\_1..+12V, pin\_2..+6V, pin\_3..nc, pin\_4..switched to ground







## Configuration

### Enable Air Canister sampling

The air canister sampling is enabled in software with the parameter **Air\_Canister\_SamplingOn** In Setup -> Configuration -> Options -> Main Configuration with "Advanced" on. By enabling the air canister handling a new configuration point " Air Canister" appear.

airpointer 📰 🛛 Gra	ph Download	Stationbook	Overview	Calibration	Setup	
Configuration - Air Canis	ter					
Advanced <b>v</b> <u>Main Configuration</u> : <u>Debug</u>						
Main Configuration						
Air_Canister_1_On [on/off]						💿 On 🔘 Off
Air_Canister_2_On [on/off]						🖲 On 🔘 Off
Air_Canister_3_On [on/off]						🔍 On 🔾 Off
Enables Air Canister : Air_Canister_4_On [on/off]						On Off
Enables Air Canister						
Enables Air Canister						
Enables Air Canister						On Off
Air_Canister_7_On [on/off]						🔘 On 🖲 Off
:Air_Canister_8_On [on/off] Enables Air Canister Save						On Off
Debug						
Air_Canister_Test_On [on/off] Enables Air Canister Testmode, no normal s	ampling can be perform	ed !!!!				On Off
Save						



Here you can enable the valves you want to use. For testing purposes only you can enable a test mode here, we will explain a little later.

## Configuring the rules & actions

Opening Setup -> Rules & Actions -> Actions brings up a now new type of action called "Air Canister":

	🗖 airpointer 📰 🛛 🤇				Setup	•
Rules & Actions	Manage Actions					
co Rules	Hanage Actions					
co Actions	<u>Air Canister</u>					
G Delauits	Digital Output					
System Maintenance	<u>Eigenmeldung</u>					
	<u>E-Mail</u>					
Configuration	FTP Upload					
E ThinLog	Script					
🗉 🛅 LinOut	SMS					
🗉 🎦 Air Canister Sampling	Station Status					
E Communication	WaterSam Sample					
Support Programs						
User Administration	Air Canister					
	Canister 1 Full [2]		Test			
	Kanister 4 solange wie R	<u>Regel</u> [5]	Test			
	Nummer 3 Voll [4]		Test			
	Nummer 2 Zizerlweise	[3]	Test			
	Add					
	Digital Output					
	Add					
	Eigenmeldung					
	Add					

#### Pressing <Add> brings up the configuration for a new Air Canister Action:

airpointer 🔜	Graph	Download	Stationbook	Overview	Calibration	Setup	6		=
Manage Actions									
Air Canister									
Back									
Name									
Description								1	
Active		O On	Off						
RootOnly		On On	Off Off						
Nr		-	~						Select canister number
Туре		-		~					Select type of operation mode
Time									Seconds
Save Delete									

Give the rule a name like Valve\_1\_full, add a description if you want to help other users and set it Active. Now choose the number of valve from the pull down menu.

Manage Actions		
Air Canister Back		
Name	Valve_1_full	
Description	Canister 1 will open until the canister is fully filled.	
Active	● On ○ Off	
A RootOnly	On Off	
Nr	Canister 1 🕶	Select canister number
Туре	- <b>v</b>	Select type of operation mode
Time	-	Seconds
Save Delete	Sample who rule duration sample whole bottle	

Now you can define how long the valve should be open.

**Sample for a fixed interval:** Choose this if you want that the valve is open for example 10min = 600seconds, each time the action is triggered. Type in the interval you need in "Time".



**Sample whole rule duration:** With this setting the valve is open as long the rule triggering the action is active.

Sample whole bottle: When triggered the whole canister is filled up.

Valid for all settings is that as soon the software has calculated that the canister is full it will not open the valve again.

With the action defined you define the rule you want to use.

As example we want to sample when ozone is above 200ppb. You choose Setup -> Rules & Actions -> Rules -> Measuring Signal Value Check, and press <add>.

In the new Rule fill out name, description, set it active, set the limit and choose the right parameter from the list:

Manage Rules			
Measuring Signal Value Check			
Back			
Name	Ozone > 200		
Description			
Active	● On ○ Off		
A RootOnly	On Off		
Alarm Emphasis	0		0 => Off
Minimum Switch Time	1800		Seconds
Rule Repetition Time			Minutes, 0 => Off
Parameter	O3Sensor [3]	· ·	
Value Type	0 🗸	- A	0Actual value 1,2,3Average 4
Check Higher	💿 On 🔿 Off	Flow A	
Value 1	200	Flow_B	
Check Lower	🔘 On 🔍 Off	LampPower	
Value 2		03	
Check Rising	On Off	O3_all O3_A_raw	Checks if the change (absolute val exceeds the limit
Value 3		O3_B_raw O3StdDev	
Check Falling	On Off	O3StdDevRaw O3_Zero	Checks if the change (absolute val exceeds the limit
Value 4		O3_Zero_Setpoint	
Time Period		PhotoOutMeas_B	0 (off) 60 (max) Samples
Valid Maintenance	🔘 On 🔍 Off	PhotoOutRef_B	
Valid Failure Status	🔘 On 🔍 Off	PowerToBenchO3 PressO3	
Valid Data Global	🔘 On 🔍 Off	110000	1 use global setting
Valid Data Check	🔘 On 😐 Off		

When you are fine with your setup press <save> now edit your new rule again, on Assigned Actions press <add> And assign the action you have defined before:

🗖 airpointer 📰 🔍 🤇	Graph Download	Stationbook	Overview	Calibration Setup	0		=
Manage Rules							
Assign an Action - Ozone > 20	D0						
Back							
Action	calling record	dum 🗸				Select an Action	
Raua	calling record	lum					
Save	Kanister 4 so	lange wie Regel	_				
	Nummer 3 Vo	oll					
	Nummor 2	Zizarlwaisa					

It is a good idea to have a look at all possibilities of rules & actions, there is a very good chance you find exactly what you need.

# Test possibility

If you want to test your cabling before you startup your very first sampling you can activate Air\_Canister\_Test\_on in Setup -> Configuration -> Air Canister



Enables Air Canister Save	
Debug	
Air_Canister_Test_On [on/off] Enables Air Canister Testmode, no normal sampling can be performed !!!! Save	O on 💿 Off
Save	

Choose Setup -> Air Canister Sampling -> Air Canister Manager for this page: (You find same page in LinSens Service Interface also)

<b>a</b> iı	alrpointer 🔜 Grajd Baandaad Mathadhadk Geordean Collisation 2011 😥											
Air C	lir Canister Manager											
mana	nanage storage of air for later analysis											
Air C	Ar Canister Sampling											
	Cylinder ID	Parameter	Value	Unit	Parameter	Val	ue	Unit	Parameter	Value	Unit	
1	Kanister 1 3.12.	AirCan_1_valve	-9999		AirCan_1_Seconds_On	-99	99	sec	AirCan_1_Volume	-9999.0	mi	
2	Canister 2 Vormittag Donnerstag	AirCan_2_valve	-9999		AirCan_2_Seconds_On	-99	99	sec	AirCan_2_Volume	-9999.0	mi	
3	Bag4 1.12.2020	AirCan_3_valve	-9999		AirCan_3_Seconds_On	-9999		sec	AirCan_3_Volume	-9999.0	mi	
4	Canister 4 SN 456	AirCan_4_valve	-9999		AirCan_4_Seconds_On	-99	99	sec	AirCan_4_Volume	-9999.0	mi	
5	Canister 5	AirCan_5_valve	-9999		AirCan_5_Seconds_On	-99	99	sec	AirCan_5_Volume	-9999.0	ml	
							Valve set	Stop	sampling to canister	Start with empty can	ister	
		1					OFF			Valve ON		
		2					ON		Valve OFF	Valve ON		
	3 ON Valve OFF Valve ON											
		4					OFF			Valve ON		
		5					ON		Valve OFF	Valve ON		

(the -9999 is shown because I had no hardware connected, I need to change this pic later on)

With the <Valve ON> <Valve OFF> buttons you can turn on and off the valve manually. When you have finished your test turn off test mode.

# Operation

After all the preparation the canister can be connected. You choose Setup -> Air Canister Sampling -> Air Canister Manager to get this page again.

air	airpointer Graph Download Stationbook Overview Calibration Settor 👂												
Air C	Air Canister Manager												
mana	manage storage of air for later analysis												
Air Ca	Air Canister Sampling												
		Cylinder ID	Parameter	Value	Unit		Parameter	V	lue	Unit	Parameter	Value	Unit
1		Kanister 1 3.12.	AirCan_1_valve	-9999			AirCan_1_Seconds_On		0	sec	AirCan_1_Volume	0.0	mi
2	Ca	nister 2 Vormittag Donnerstag	AirCan_2_valve	-9999			AirCan_2_Seconds_On		0	sec	AirCan_2_Volume	0.0	mi
3		Bag4 1.12.2020	AirCan_3_valve	-9999			AirCan_3_Seconds_On		0	sec	AirCan_3_Volume	0.0	mi
4		Canister 4 SN 456	AirCan_4_valve	-9999			AirCan_4_Seconds_On		0	sec	AirCan_4_Volume	0.0	mi
5		Canister 5	AirCan_5_valve	-9999			AirCan_5_Seconds_On		0	sec	AirCan_5_Volume	0.0	mi
	Cylinder ID canister volume(m) nominal flow(mitmin) Store your entries Sampling Valve set Stop sampling to canister Start with empty canister												
1 Re	sticker SN:2345_34			1000	5.2		Store	diabled	OFF			Start	
2 Ca	iister 2						Store	diabled	OFF			Start	
3 Ca	iister 2					Store	diabled	OFF			Start		
4 Ca	iister 4						Store	diabled	OFF			Start	
5 Ca	iister 5						Store	diabled	OFF		Stop	Start	
Last 10	completed Air Canis	ster Sampling Results press reload to upgrad	e										
n	Valve number	Cylind	er ID		Start		Finished	Volume sa	mpled [ml]		Time sam	oled [sec]	
1	1	Kanis	ler 1		20201201 19:23:56		20201202 10:10:20	2000.0		23077		77	
2	2	Canis	ter 2		20201201 19:24:18	201 19:24:18 20201		150	0.0	6		6000	
3	3	Bag4 1.1	2.2020		20201201 19:25:06	20201202 10:10:32		1000.0			60	00	
- 4	1	Kanis	ler 1		20201202 10:10:28		20201202 19:01:16	200	0.0		230	77	
5	2	Canister 2	Vormittag		20201202 10:10:55		20201202 19:01:16	150	0.0		60	00	
6	3	Bag4 1.1	2.2020		20201202 10:10:56	_	20201202 19:01:17	100	0.0		60	00	
7	4	Canister 4	SN 456		20201201 19:25:05	_	20201202 19:01:18	82	5.0		390	00	
8	1	Kanister 1 2	.12.Abend		20201202 19:01:37		20201203 07:04:05	200	0.0		230	11	
9 Z Center vorminag 2020/2020 1901.37 22201030 10 3 Ban4 112 2020 2020 2020120 2020 2020 2020 2								100	0.0		60	20	
10	10 3 000011162000 100130 200010001 10000 0000												
4													Þ

(the -9999 is shown because I had no hardware connected, I need to change this pic later on)

In the upper part you find the actual data, the part in the middle is your part to operate, the lower part is displaying the last 10 results.

What you have to do now is to fill out the cylinder ID with the serial of the canister or something else that makes sure you know what canister is in. Fill in the volume of the canister and the nominal flow and press <store> please fill out line by line and press store for each. After pressing <start> the canister is enabled for sampling. As soon the action you have defined is triggered the valve will be opened and the sample is taken.



<b>a</b> i	rpointer 🚃	Graph Download Stationbook	Overview Calibr	ation Setup	0											=
Air (	Canister Manage	r														
mana	sanage storage of air for later analysis															
Air C	ir Canister Sampling															
		Cylinder ID	Parameter	,	/alue	Unit		Pa	aramete	r	v	lue	Unit	Parameter	Value	Unit
1		Red sticker SN:2345_34	AirCan_1_valve		9999			AirCan_1	1_Secor	nds_On		41	sec	AirCan_1_Volume	3.6	mi
2		Canister 2	AirCan_2_valve		9999			AirCan_2	2_Secor	nds_On		0	Sec	AirCan_2_Volume	0.0	mi
3		Canister 3	AirCan_3_valve		9999			AirCan_3	3_Secor	nds_On		0	sec	AirCan_3_Volume	0.0	mi
4		Canister 4	AirCan_4_valve		9999			AirCan_4	4_Secor	nds_On		0	sec	AirCan_4_Volume	0.0	mi
5		Canister 5	AirCan_5_valve		9999			AirCan_5	5_Secor	nds_On		0	sec	AirCan_5_Volume	0.0	mi
	Cylinder ID canister volume(nt) somikal flow(minim) Store your entries Sampting Usive set Stop sampting to canister Start with empty canister															
1 R	erl sticker SN 2345-34	-,		1000		52			St		enabled	ON		Stop	Start	
2 0	anister 2				_				St	ore	diabled	OFF	Stop		Start	
3 C	anister 3								St	ore	diabled	OFF			Start	
4 0	anister 4				_			=	St	ore	diabled	OFF			Start	
5 C	anister 5					1			St	ore	diabled	OFF			Start	
Last 1	0 completed Air Canis	ter Sampling Results press reload to upgrad	e ID			Elect		Fie	nishod		Malumo en	moled fmil		Time cam	nind (sec)	
	valve humber	Cylind			Start Finished				Voidine sampled pintj				hied [sec]			
2	2	Kanis	ler i		20	201201 19:23:56	-	2020120	02 10.1	0.20	200	0.0		235	00	
-	-	Bast 11	2 2020		20	201201 19:25:06		2020120	02 10:1	0.31	100	0.0		60	00	
4	1	Kanis	ter 1		20	201202 10:10:28	-	2020120	02 19:0	1:16	200	0.0		230	77	
5	2	Canister 2	Vormittag		20	201202 10:10:55		2020120	02 19:0	1:16	150	0.0		60	00	
6	3	Beg4 1.1	2.2020		20	201202 10:10:56		2020120	02 19:0	1:17	100	0.0		60	00	
7 4 Canister 4 SN 456					20	201201 19:25:05		2020120	02 19:0	1:18	82	5.0		396	500	
8	1		20	201202 19:01:37		2020120	03 07:0	4:05	200	0.0		230	077			
9 2 Canister 2 Vormittag						201202 19:01:37		2020120	03 07:0	4:06	150	0.0		60	00	
10	) 3	Bag4 1.1	2.2020		20	201202 19:01:38		2020120	03 07:0	4:07	100	0.0		60	00	

(the -9999 is shown because I had no hardware connected, I need to change this pic later on)

#### After the sampling, for example a few days later the display may look like this:

<b>a</b>	irpointer 🔜			ation Setup 🕑										
Air	Canister Manage	r -												
mar	age storage of air fo	r later analysis												
Air (	anister Sampling													
		Culiadar ID	Darameter	Male	hue	Heit		Darameter	Ma	lue.	Hoit	Darameter	Value	Itel
		Cymraet to	Parameter	Van		Unin		- arameter	**		Unix	Parameter	Value	Unit
2	Kanister 1 3.12. AirCan_1_vaive		-999	199		AirCan	1_1_Seconds_On	25	00	590	AirCan_1_volume	2000.0	m	
2	Ca	Read 5 12 2020	AirCan_2_valve		100		AirCan	2_aeconds_On		00	sec	AirCan_2_volume	1000.0	
4		Capistar 4 SN 456	AirCan 4 valve	.000	100		AirCon	A Seconds On	30	500	sec	AirCan 4 Volume	825.0	mi
5		Canister 5	AirCan 5 valve	-995	99		AirCan	5 Seconds On		)	sec	AirCan 5 Volume	0.0	mi
6		Canister name	AirCan 6 valve	-990	99		AirCan	6 Seconds On		)	sec	AirCan 6 Volume	0.0	mi
7		Canister name	AirCan_7_valve	-999	99		AirCan	_7_Seconds_On		)	sec	AirCan_7_Volume	0.0	mi
8		Canister name	AirCan_8_valve	-995	99		AirCan	_8_Seconds_On		)	sec	AirCan_8_Volume	0.0	mi
-														
	Cylinder ID canister volume(ml) nominal flow(ml/min) Store your entries Sampling Valve set Stop sampling to canister Start with empty canister											hister		
1	Kanister 1 3.12.			2000	5.2			Store	FULL	OFF		Stop		
2	Canister 2 Vormittag Donn	erstag		1500	15.0			Store	FULL	OFF		Stop		
3	3ag4 1.12.2020			1000	10.0			Store	FULL	OFF		Stop		
4	Canister 4 SN 456			825	\$25 1.2			Store	FULL	OFF		Stop		
5	Canister 5			1000	000 10.0			Store	enabled	OFF		Stop		
6	Canister name							Store	diabled	OFF		Stop	Start	
7	Canister name							Store	diabled	OFF		Stop	Start	
8	Canister name							Store	diabled	OFF		Stop	Start	
Last	10 completed Air Canis	ster Sampling Results press reload to upgrad	1e											
	N Valve number	Cylinde	er ID		Start		F	Finished	Volume sar	npled [ml]		Time sam	pled [sec]	
	1 1	Kanist	er 1		20201201 19	23:56	20201	202 10:10:20	200	1.0		230	077	
	2 2	Canist		20201201 19	24:18	20201	1202 10:10:31	150	1.0		60	00		
3 3 Bag4 1.12.2020				20201201 19	25:06	20201	202 10:10:32	100	1.0		60	00		
	4 1 Kanister 1				20201202 10	10:28	20201	202 19:01:16	200	1.0		230	777	
	5 2 Canister 2 Vormittag			20201202 10	10:55	20201	202 19:01:16	150	1.0		60	00		
	6 3 Bag4 1.12.2020			20201202 10:10:56		20201	1202 19:01:17	100	1.0	6000				
	7 4 Canister 4 SN 456				20201201 19:25:05 2			202 19:01:18	825	.0	39500			
	3 1	Kanister 1 2.	12.Abend		20201202 19	01:37	20201	1203 07:04:05	200	1.0		230	777	

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We have 4 full canisters in that example. You press <stop> to finish the data set, take the canister(s) with you and connect fresh ones.

# Getting data

#### Download

You can download the data of the air canister sampling using Download -> Exports -> Air canisters

	airpointer Graph Download Stationbook		
E Download	Quick access to Air Canister Data		
co Sensors	Quick	- v	Set From/Till Override
op Sensors (Ad-hoc)	Period	0 Days 0 Hours	
B Define	Last	C on • Off	Fetch data of last sample
Sensors     Export Definitions     Mir Canisters	From Till	2020 ♥ - Dec ♥ - 10 ♥         00 ♥ : 00 ♥ = NULL           2020 ♥ - Dec ♥ - 17 ♥         00 ♥ : 00 ♥ = NULL	2004-01-01 00:00 means NO date -> NULL
export Definitions	Air Canister Nr	Canister 1 V	Choose the sample bottle
Common ***	Generate	json 🗸	Generate download URL of your choices
Copore interormando			Do a Download NOW (max 512MB)
	Log		
	A		

Choose "Last" or define a time period, select the canister nr and the file format and press <Generate> After some seconds the file is prepared and ready for download.



	airpointer Graph Download Stationbook	Overview Calibration Setup 😟	=			
© Download	Quick access to Air Canister Data					
Sensors     Sensors     Sensors     Sensors     Al-Canisters     Define     Persors     Ar Canisters     Port     Persors     Port     Port	Quick	· · · · ·	Set From/Till Override			
	Period	0 Days 0 Hours				
	Last	C on Off	Fetch data of last sample			
	From	2020 V - Dec V - 10 V 00 V = 2020-12-10 00:00:00	2004-01-01 00:00 means NO date -> NULL			
	тіш	2020 v - Dec v - 17 v 00 v : 00 v = 2020-12-17 00:00:00				
	Air Canister Nr	Canister 1 🗸	Choose the sample bottle			
	Generate	json 🗸	Generate download URL of your choices			
		Download the export file	Do a Download NOW (max 512MB)			
	Log					
	<b>A</b>					

### Prepare Export for rules & action

You can define an Export to be used in rules & actions by choosing Download -> Define -> Air Canister Export Definitions. Choose the data format you need:

_	airpointer Graph Download S	tationbook Overview Calibration Setup 🌐		=	
O Download     O	Create and Manage Air Canister Export Configurations				
	Configuration Back				
	Name	Air Can Export	*	Assign a meaningful name	
	Station name	201300ts4 - Silver city			
	Description	Air Canister data			
	Last Sample	On • Off		Export last sample	
	Period			Minutes	
	Air Canister Number	Canister 1 V		Export usage of selected air canister bottle	
	Null	NULL	]	Placeholder for Null values	
	Missing	-9999		Placeholder for Missing values	
	Compression	zip v			
	See Data				

Fill out the form, most important is to choose the Air Canister Number. If you set Last Sample to on you get just the data of the last sample, otherwise you can define a start and stop time later on. Save this setup.

You can use this setup now in the rule and action system.