



INSTALLATION GUIDE DBS-MS 500



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1 Introduction

The main function of the DBS-MS 500 is the fully automated solvent extraction of dried blood spot samples for detection by a mass spectrometer. The samples are delivered on cards, with up to four spots per card. To ensure reliable automated sample extraction and handling, these cards are stored in removable racks which hold them in exactly defined positions inside the instrument. The instruments handling module picks cards out of the rack and carries them to an image processing system and then to an optional station for the application of the internal standard before delivering the card to the extraction unit. Finally, the sampled cards are stored back in the rack position they were picked from. With the image processing system, multiple quality factors and identification features of each card will be measured and checked to ensure the correct spot is sampled and that this spot has not been incorrectly spotted, or previously sampled. The exact positioning of the card in the extraction unit will be made according to these values. The optional IS working solution will be applied at the internal standard station to only the sample to be extracted. At the extraction unit the analyte will be eluted out of the card using the preferred solvents (specific extraction solvent mixture). This extract will then be delivered to the HPLC-MS system for further separation and detection as required. Handling and extraction processes are to be designed for maximum robustness and minimum carryover.

1.1 Precaution



Before installing/using the instrument, check the section "Precaution" in the instruction manual

When working with analytical instrumentation, you must know the potential hazards of using chemical solvents. Many organic solvents, mobile phases and samples are harmful to health. Be sure that you know the toxic and infectious properties of all substances you are using.



This sign draws attention to the fact that failure to take note of the accompanying information (on instrument, in this manual and the respective instruction manual) may result in damage of the instrument



This sign draws attention to the potential risks due to pathogenic or genetically modified organisms and serves to reduce the dispersal and uncontrolled multiplication

of organisms and to protect people from unintentional infection. If handling with such substances be aware of the applicable guidelines.



Be aware of the special risks when opening the instrument Use only original CAMAG spare parts Switch off the instrument before you open the instrument

1.2 Parts supplied

Check with reference to the parts supplied section in the instruction manual for complete shipment of instrument and accessories.

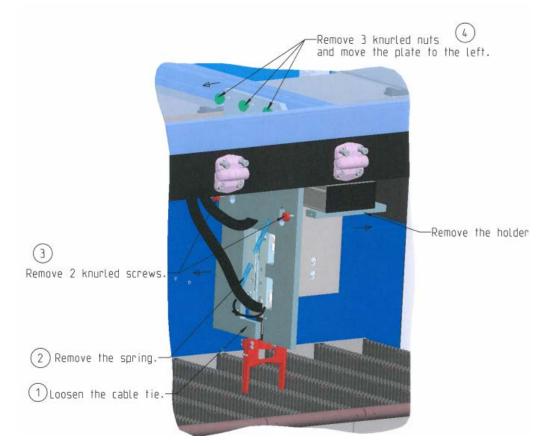
2 Unpacking/Installation

- Check the installation environment according the Environment Specification (CAMAG SOP 402)
- Lift the instrument with the necessary care (4 persons) out of its packaging.
- Place it according the Environment Specification

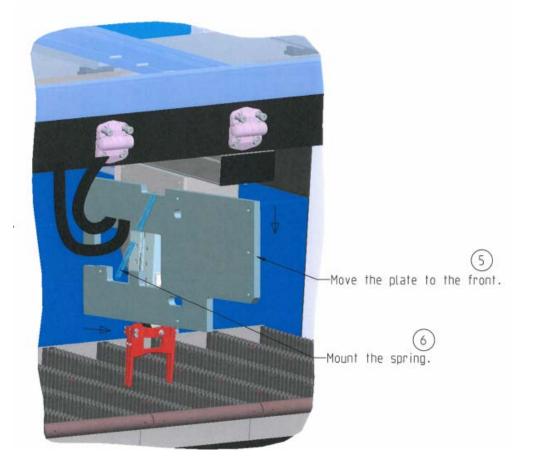
2.1 Removal of shipping protection

- 1. Loosen the cable tie
- 2. Remove the spring of the gripper arm
- 3. Remove the 2 knurled screws and the gripper arm holder
- 4. Remove the 3 knurled nuts and move the plate of the shipping protection to the left

Unpacking/Installation



- 5. Move the plate of the shipping protection to the front and
- 6. Mont the spring of the gripper arm



- 2.2 Installation of the instrument
 - Mount the 5 racks (insert the backside of the racks first)

Fluidics



During usage, empty the waste canister on a regular base. If you refill the

extraction/rinsing bottles check the solvent level of the waste canister.

Make sure all bottles are clearly and correctly labelled with their content.

CAMAG strongly recommends using degassed solvents only to reduce micro-bubbles in the system.

• Connect the waste canister according below figure



Fig. 1: Waste canister connection

- Fill and connect the solvent bottle 1 (500ml, tube "Elution 1" and "E1/R3") with your appropriate elution solvent
- Fill and connect the solvent bottle 2 (500ml, tube "Elution 2" and "E1/R3") with your appropriate elution solvent
- Fill and connect the rinsing liquid bottle 1 (1000ml, tube "Rinsing R1") with your appropriate rinsing solvent
- Fill and connect the rinsing liquid bottle 2 (1000ml, tube "Rinsing R2") with your appropriate rinsing solvent
- If applicable, fill and connect the internal standards (IS) bottles (25ml, IS1, 2, 3, 4) with your appropriate standard solution
- Fill and connect the IS rinsing bottle (250ml) with your appropriate solution
- Connect the external system pump with 10-32 fittings to Valve3, port 4; according the below shown figures
- Connect the MS with 10-32 fittings to Valve 2, port 7; according the below shown figures



CAMAG strongly recommends keeping the connection as short as possible (no longer then 2m) to maintain measurement accuracy and quality.

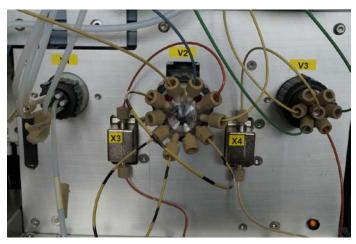
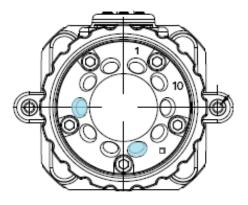


Fig. 2: Valves:Fluid Selection F-V1 /Loop F-V2/ CDM (Controlled Delivery Module) F-V3



Port 4: From LC Pump Port 7: To LC/MS system

Fig. 3: Loop valve F-V2 connection scheme

Electrics

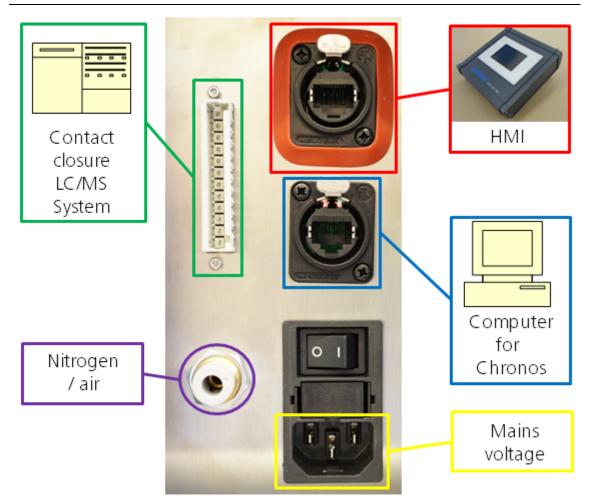


Fig 4. Electric connection panel

- Connect the HMI with the instrument (red)
- Connect the air or Nitrogen pressure (>5.5 bar up to 8 bar) with a 6mm outer diameter hose (purple). Make sure you keep the length of the hose as short and the diameter as big as possible
- Connect the required contact closure according table 1 (green, additional information about the contact closure you can find in chapter 3 Hardware Connections of this document) to your measurement system control
- Connect the power cord (use only the original delivered CAMAG power cord)
- Connect the LAN cable to the computer (for use of CHRONOS software)
- Switch on the unit

Software

Check the user manual of Chronos (by Axel Semrau GmbH& CO KG) for CAMAG for computer requirements and installation of the software.

Priming

Prior to first use or after a longer period of non-using the instrument, the fluidic has to be filled with the respective solvents (Priming).

Priming of extraction circuit

- Choose "Manual"
- Choose "Extractor"
- For the extraction pump (Prime EX):

If the system was completely empty, priming can take up to 50 cycles

• For the rinsing pump (Prime Ri): Activate the pump for about 60 sec. Priming is finished when the pressure of extraction and rinsing pump is stable (extraction pump only during dosing). If the system was completely empty, priming can take up to 5 min.

Priming of IS circuit

- Choose "manual"
- Choose "Internal Standard"
- Choose the appropriate IS Bottle
- Set the no of Prime Cycles to 5
- Set the destination parameter to "to waste"
- Activate the priming
- Set the destination parameter to "to Needle"
- Activate the priming
- Repeat the steps above until no more air bubbles are visible in the IS syringe

Priming of IS cleaning circuit

- Choose "manual"
- Choose "Internal Standard"
- Set the time parameter to "5'000" (ms)
- Activate the priming by clicking the "cleaning" button
- Repeat the steps above until a nice and constant jet of IS cleaning solvent is visible from the IS needle



At the priming stage, watch out for any signs of leakage at the fluidic part of the instrument.

Your system is now ready to use!

Remote control allows easy connection between single instruments or systems to ensure coordinated analysis with simple coupling requirements.

CAMAG DBS-MS500 is simply to include into an LC/MS System similar to an Autosampler and uses a contact closure connector to communicate with other parts of the system. In this Attachment, you find some examples with the most common brands.

3.1 CAMAG DBS-MS500 contact closure

Pin	Signal	Description
1	NC	Delay 4 Lean Julian
2	NO	Relay 1; Loop Inline (Start signal to LC/MS)
3	СОМ	
4	NC	Delay 2: DDC Deady
5	NO	Relay 2; DBS Ready (DBS-MS500 is ready)
6	СОМ	
7	IN+	Opto 1; LCMS Ready
8	IN- (GND)	(LC/MS is ready)
9	IN+	Opto 2; Start NxtExtr
10	IN- (GND)	(DBS-MS500 can start next extraction)
11	+24V	Power
12	GND	Power

Contact closure connector

Legend:

NC = normally closed NO = normally open

IN+= optical input positive (24V)

IN- = optical input ground (GND)

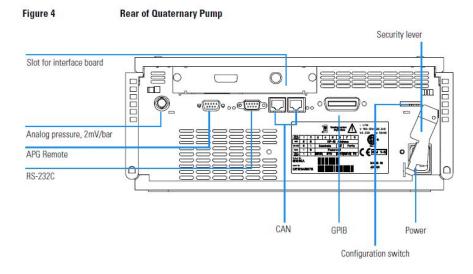
The loose end cable delivered with the instrument has following connection scheme:

						DBS-MS500
	and of ashie	1		 1	NC	Relay1 Loop Inline
	ose end of cable			 2	NO	Relay1 Loop Inline
White	Pin 1	< <u> </u>		3	сом	Relay1 Loop Inline
Grey	Pin 2	<		4	NC	Relay 2; DBS Ready
Blue	Pin 3/6/12	<		 5	NO	Relay 2; DBS Ready
Green	Pin 4	<		 6	сом	Relay 2; DBS Ready
Yellow	Pin 5	<		 7	IN+	Opto 1; LCMS Ready
Broun	Pin 7	<		8	IN-	Opto 1; LCMS Ready
Pink	Pin 9	<		 9	IN+	Opto 2; LCMS Ready
Red	Pin 11	<		10	IN-	Opto 2; LCMS Ready
				 11	+24V	Power
				12	GND	Power

3.2 Connectors on measurement systems

Agilent APG remote interface

Agilent uses the APG Remote Interface; see following drawings and definitions:



Remote Cables

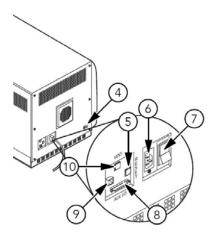
One end of these cables provides a Agilent Technologies <u>APG</u> (Analytical Products Group) remote connector to be connected to Agilent 1100 Series modules. The other end depends on the instrument to be connected to.

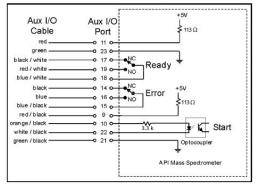
- standard TTL levels (0 V is logic true, + 5.0 V is false),
- fan-out is 10,
- · input load is 2.2 kOhm against + 5.0 V, and
- · output are open collector type, inputs/outputs (wired- or technique).

Pin Agilent 1100	Signal Name	Active (TTL)	Туре
1 - White	Digital ground		
2 - Brown	Prepare run	Low	Out
3 - Gray	Start	Low	In
4 - Blue	Shut down	Low	In/Out
5 - Pink	Not connected		
6 - Yellow	Power on	High	In/Out
7 - Red	Ready	High	Out
8 - Green	Stop	Low	In/Out
9 - Black	Start request	Low	Out

AB Sciex AUX/ I/O interface

AB Sciex uses the AUX I/O Interface (8); see following drawings and definitions:





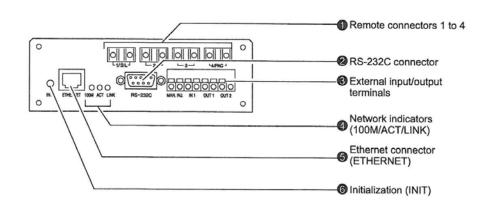
	Pin 9 (power 5V)	Red with black stripes
L	Pin 10 (anode)	Orange with black stripes
White with black stripe	Pin 22 (cathode)	White with black stripes
Green with black stripe	Pin 21 (ground)	Green with black stripes

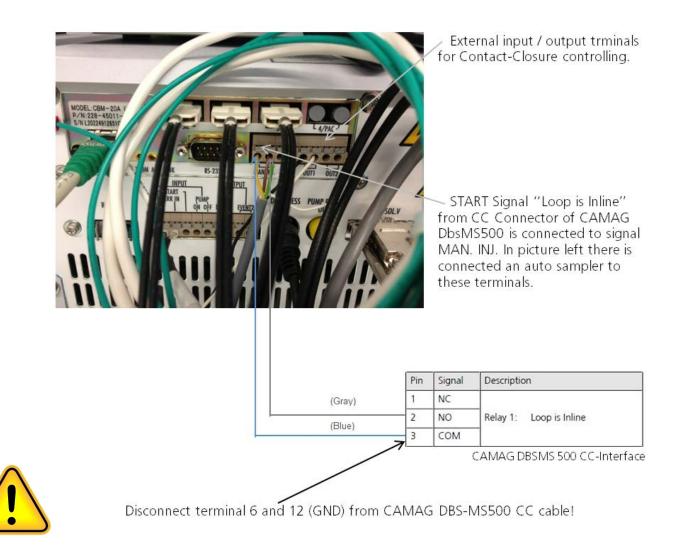
Figure A-2 Schematic of the AUX I/O interface and cable on the 5500 series of instruments.

Shimadzu event interface

You have to connect a cable between the MAN. INJ. terminal and Dbs500 out signal "Loop is Inline"; see following pictures:

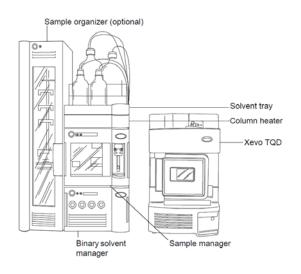
Back side of Shimadzu Controller CBM-20A/20Alite:

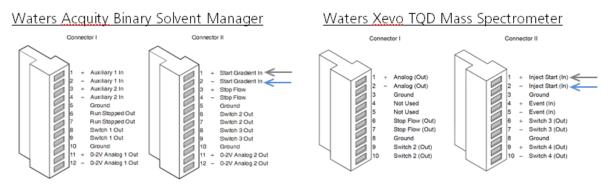




Waters Xevo TQD with AQUITY UPLC system

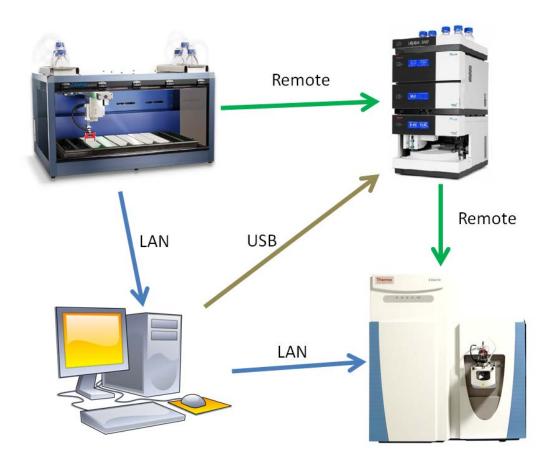
For remote control you have to use Connectors I/II of respectively used device (Solvent Manager or Xevo TQD Mass spectrometer), see following pictures:



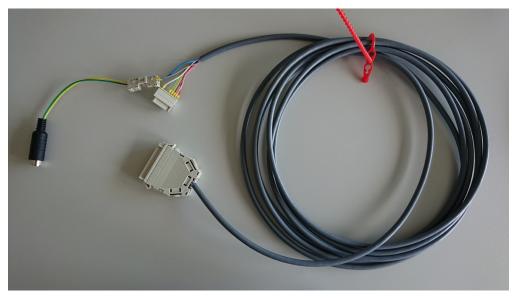


Output signal "Stop Flow" could be used as an "Error" signal to stop DBS-MS 500. Switch 2-4 are software configurable signals and could be used to send a "Start Next Sample" signal to the DBS-MS 500. Connect in minimum the DBS-MS 500 signal "Loop is Inline" to Waters connector II at Pin 1-2.

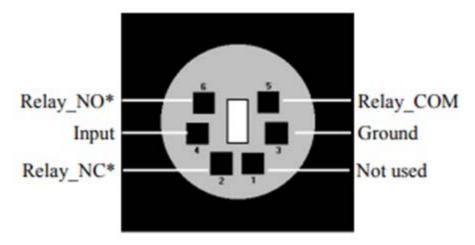
Thermo system under Xcalibur



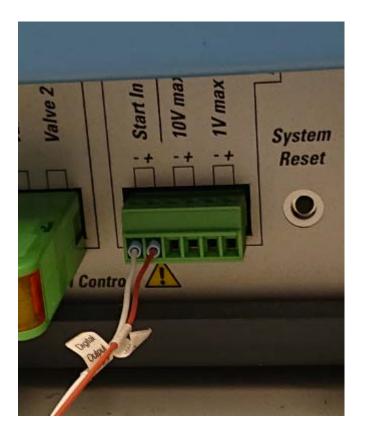
Remote connection between DBS-MS 500 and Thermo (use port 1 at the LC)



Thermo connector to the LC pump



Remote control from LC (output 2) to MS (start in)

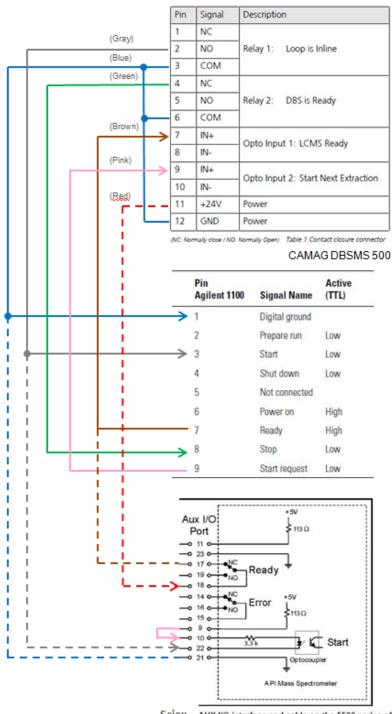


3.3 Connection examples

If you want to use input signals on DBS-MS500 you have to configure this in the service dialog of the DBS-MS500.

LC/MS system of Agilent and Sciex

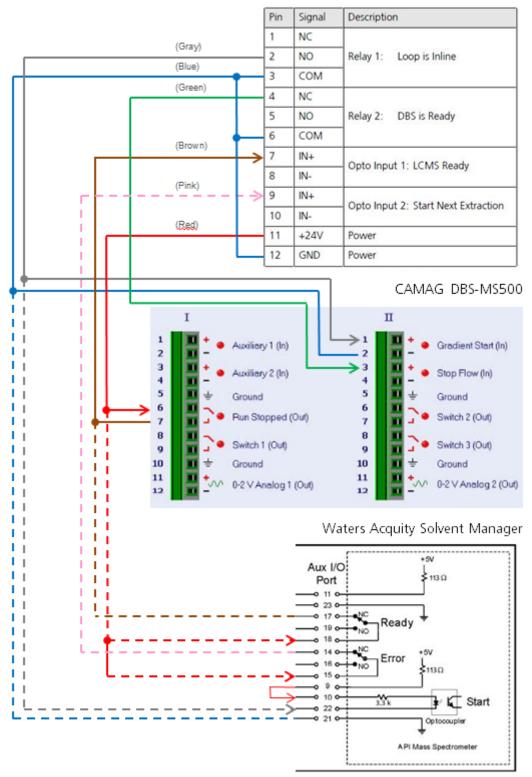
Near the main power socket the 12 Pin Contact/Closure Interface Connector of CAMAG DBS-MS500 can be found. For a minimum wiring you have to connect pin 2/3 of CAMAG connector to pin 1/3 of APG Remote Interface or to pin 21/22 (bridge between pin 9/10) of Sciex AUX I/O connector. Do not connect APG Remote Interface and Sciex AUX I/O in parallel. See following drawing:



Sciex AUX I/O interface and cable on the 5500 series of

LC/MS system of Waters and Sciex

Near the main power socket, the 12 Pin Contact/Closure Interface Connector of CAMAG DbsMs500 can be found. For a minimum wiring you only have to connect wires on Pin 2/3. Do not connect Waters Interface and Sciex AUX I/O in parallel.



Sciex Aux IIO Interface

Thermo system under Xcalibur

Pin
1
▶ 2
▶ 3
4
5
6
7
8
9
10
11
12
10 11

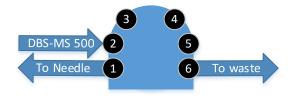
Note that DBS-MS 500 port 3, 6 and 12 are connected internally within the plug.

3.4 Coupling a PAL fraction collector

Installation of a PAL fraction collector on the DBS-MS500

- Unpacking and installing the hardware
- Unpack the PAL and place it as close as possible to the DBS-MS 500
- Mount the tools on the PAL and connect them accordingly.
 - Ethernet connection directly into the SWITCH box of the DBS-MS500
 - o Power and connection cables according to the "PAL RSI User Manual"

• Fluidic capillaries (setup can be changed by adapting the PAL method in the script editor, not recommended):



- Insert a 100 µl syringe into the dilutor and prime it
- Connect the interface cable (remote cable) with the DBS-MS500

Pin PAL	Description	Wire color	Pin DBS-	Description
			MS500	
7	TTL-In 1 Start	Yellow	1	Loop inline (NC)
8	Gnd	Green	3	Loop inline (NC)
3	SW-Out1(NC)	White	9	+24V
4	SW-Out2 (NC)	Broun	11	Next Sample

- Configure the PAL according the "PAL RSI User Manual"
 - IP = 172.20.62.35
- 1. Teach all modules

Menu I/O

SWOut 1

	Signal On		
	Low Active		
TTL lr	1		
	Signal On		
	Debug Time	20 ms	i
	Low Active		
Menu,	Input Signal 1		
	Signal On	х	
	Time	0 ms	
	TTL In 1		
Menu,	Output Signal 1		
	Signal On		
	SW Out 1		
	Dest Aux	None	
	Pulse Duration		2000 ms

- Open the PAL executor (program on "PAL data for installation and analysis (copy to stick)")
 - Connect Connection Choose or enter PAL endpoint address 1722/d2235 Example: 192108.99230 Client Rule 0C1 Connect Cancel
- o Enter the IP address

• Load "PAL_method.xml" and define all parameters;

Parameter Setup				Select Method							
 Unknown 				Mathind, Exercitor							
bottomSenseSampleVial	Off	Ŧ		Parameter Name	Value		Defeuit		Máx		
dilutor	Dilutor 1	Ŧ		schert/slune weiNolume		40 µ4	10	0	1000		
dispenseDelay		_	s	tractur schertPotDistor schertRejisteRowRete		40 pl 2 200 pl	2		100 6 1000.000000000002		
heightFromBottomSampleVial	_	2	mm	schertOspetieForRat schertDspetieForRat municeOPrinting			1000		100.0000000002		
liquidChromatograph	LC1	Ŧ		primitidentDistors	04	ì	ON .				
washStation	LCMS Wash 1	Ŧ		1						CR	Carton

• Create or load a sample list and convert it to a job list

20	New Sample List	Ctrl-N	1			
ust [Load Sample List		ample Rack		Index	Sample Parameter
-	Save Sample List		older 1:Slot1	•	1 0	solventVolume = 40 µL; washVolume = 100 µL; frontCut = 40 µL; solventPortDilut
ts	Add Sample		older 1:Slot1	*	2 0	solventVolume = 40 µL; washVolume = 100 µL; frontCut = 40 µL; solventPortDilut
- 1	Create Job List		older 1:Slot1	•	3 🗘	solventVolume = 40 µL; washVolume = 100 µL; frontCut = 40 µL; solventPortDilut
1	Method Executor	Trav	Holder 1:Slot1	•	4 \$	solventVolume = 40 uL: washVolume = 100 uL: frontCut = 40 uL: solventPortDilut

• Load Chronos and create a sample list with the method "Method_Chronos.cam"

	Analysis Method	Rack No	Card	Spot	Card Type
1	C: \Users \Administrator \Documents \CAMAG \Using the PAL \Method_Chronos.cam	Rack1	1	1	Camag2
2	$\label{eq:c:Users} \mbox{Administrator} \mbox{Documents} \mbox{CAMAG} \mbox{Using the PAL} \mbox{Method} \mbox{Chronos.cam} \mbox{cam} \mbox{Administrator} Administrator$	Rack1	1	2	Camag2
3	C:\Users\Administrator\Documents\CAMAG\Using the PAL\Method_Chronos.cam	Rack1	1	3	Camag2

• Start both runs

	the size a						1				Demo Versio	1
5 F	State.	faid	14	Mathed	lacation	Sampa	Sangie kt					
	Done	Second	603,00005	Method Lizoutor	Stey Holder 15/ot11	solverf/plane = 40 al. r	THE				Schedule 1	
	Rever			Method Executor	Tray Holder 3 Stats 2	sphreetVolume = 40 µL v	Introduce and					
	Q.euni			Method, Executor	Tray Holder 15ot13 Tray Holder 15ot14	solverWolume s 40 µl. + solverWolume s 40 µl. +	nat-control		_		1-1-2 mar	
	4,645	O'REGAR	0.100004	and the second	only some training	Chemistry of the Land P. 1	14				-	
							Period with			1.0		
							(81)					
							(articup)	Samples				
							8	01 T				100
							Alboma .	50			11	
							0.					
							Thread .					
							641377					
								1				
								644	12 10 13 2	a 2.5 Ja 2.5 4	20 420 600 620 600 6	20 100 120 400 420
											Runtime (min)	
								# Sample 1	ist for			
								CIO 25 FEE	rpie to view the corresp	coding sample list entry		
L								# Run statu				
								States	column Kand the	+ DIS		
								fied action in:	BUTIC PRESINCE 20100-008	Sector		Carvalan
								Funtre:	80100123	System status:	Working	Carnera
											CR .	Internal Mondard
										System resultor	aler a	Felralor
								-				
								-				
								2.2				

- 4.1 Preparation of the network configuration
 - Connecting the DBS to a computer which is not on a network
 - o Disable wireless



 Enter an IP address in the range of the DBS-MS 500 IP address at the local area connection properties of TCP/IPv4.

Local Area Connection Properties	Internet Protocol Version 4 (TCP/IPv4) Properties
Networking Sharing	General
Connect using:	You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.
Configure This connection uses the following items:	Obtain an IP address automatically Ouse the following IP address:
Client for Microsoft Networks Boos Packet Scheduler	IP address: 172 . 20 . 62 . 29
✓	Subnet mask: 255 . 255 . 0
Internet Protocol Version 4 (TCP/IPv4)	Default gateway:
	Obtain DNS server address automatically
	Use the following DNS server addresses:
Install Uninstall Properties	Preferred DNS server:
Description Transmission Control Protocol/Internet Protocol. The default	Alternate DNS server:
wide area network protocol that provides communication across diverse interconnected networks.	Validate settings upon exit
Close Cancel	OK Cancel

- o Enable and disable the LAN connection
- Connecting the DBS to a computer which **is** on a network
 - Add a network port to the PC and install the driver
 - Follow steps of "Connecting the DBS to a computer which is not on a network"
- Connecting the DBS to a computer which is on a network (2)
 - o Plug the DBS-MS 500 into a port of the MS or vice versa
 - o Disable wireless

- Enter a IP address in the range of the IP address of the DBS-MS 500 at the local area connection properties of TCP/IPv4 (shown under "Connecting the DBS to a computer which is not an a network").
- o Add the IP address of the MS at Advanced TCP/IP settings

Local Area Connection Properties	Internet Protocol Version 4 (TCP/IPv4) Properties	Advanced TCP/IP Settings
Networking Sharing	General Alternate Configuration	IP Settings DNS WINS
Connect using:	You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator	IP addresses
Intel(R) 82579LM Gigabit Network Connection	for the appropriate IP settings.	IP address Subnet mask
Configure	Obtain an IP address automatically	DHCP Enabled
This connection uses the following items:	Use the following IP address:	
Client for Microsoft Networks	IP address:	Add Edit Remove
File and Printer Sharing for Microsoft Networks	Subnet mask:	Default gateways:
 Internet Protocol Version 6 (TCP/IPv6) 	Default gateway:	
Internet Protocol Version 4 (TCP/IPv4)		Gateway Metric
Link-Layer Topology Discovery Mapper I/O Driver Link-Layer Topology Discovery Responder	Obtain DNS server address automatically	
	Use the following DNS server addresses:	
Install Uninstall Properties	Preferred DNS server:	Add Edit Remove
Description	Alternate DNS server:	
Transmission Control Protocol/Internet Protocol. The default wide area network protocol that provides communication across diverse interconnected networks.	Validate settings upon exit Advanced	Interface metric
OK Cancel	OK Cancel	
		OK Cancel

4.2 Masslynx coupling

There are additional steps for the installation of Chronos in combination with Waters devices.

• Check the "Update status" (Masslynx/ Tools/ Options/ Update Status

Options				×		
System C Scan Number Axes Labelling: m/z V						
Retention Time MassLynx Status	U	se Acquire	d File as Default			
I♥ Update Status	Refresh rate File Name	10 C:\Mass	Seconds Lynx\status.			
Database Logging	Database	C:\Mass	Lynx\sample:			

- The Folder Masslynx/ Failed needs to be empty
- Masslynx/ Inlet method/ Configuration

Signal to External (instead of pump xxx)

Trigger via Contact-Closure

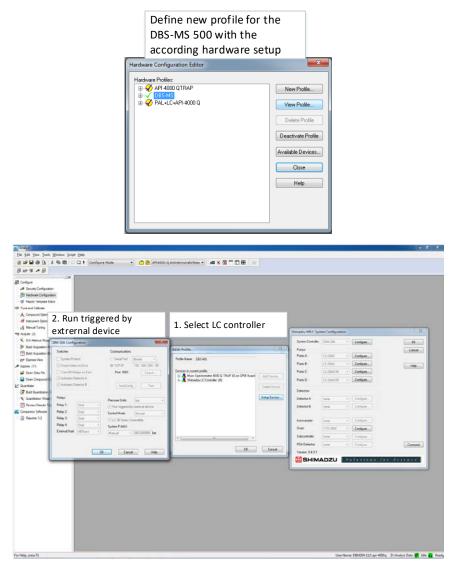
and a second sec	ted.pmx - Iniet Method	Events and Triggering Wizard
File View Tools	LC Parte Login Waters 2777 Help Co Ogn Han Am A 19 Ba (D)	Choose Triggering Method
(PP)	Status	Choose software or contact closure triggering.
Status	Det Configuration 22 United Configuration Proge Addustration Detector 1 Detector 2 United Configuration Proge National Program National Program Detector 1 Detector 2 Detector 1 Select And Sample Detector 1 Detector 1 Detector 2 Doces on addustration Select And Sample December 200 December 200 December 200 United Configuration Ween 200 Ween 200	Choose pump and/or detector trigger method, and then press Next to continue. Pump Trigger by Contact Closure Trigger by Software Detector Trigger by Contact Closure Trigger by Software
	CBuckCancel	< Back Next > Cancel

• The Chronos files send by acquisition tasks should should have the ending .raw

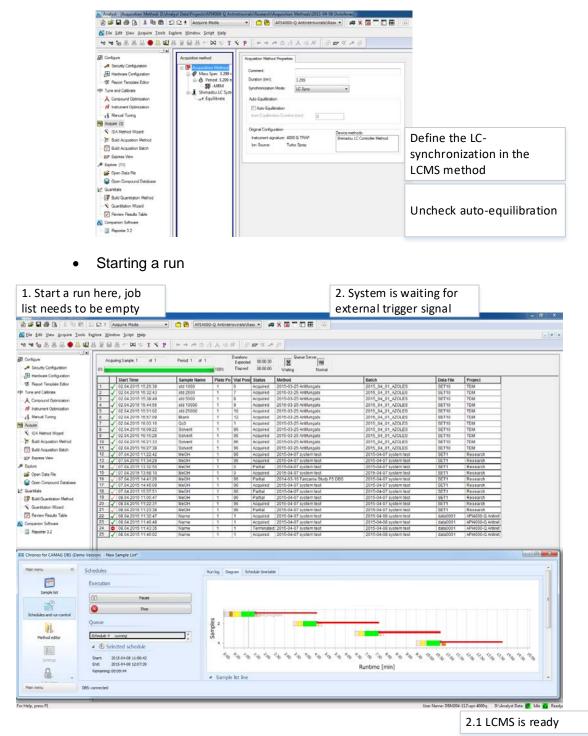
4.3 Analyst coupling

There are additional steps for the installation of Chronos in combination with Sciex devices.

• Hardware configuration in Analyst



• LCMS Method programming



- The Chronos data file names should have the ending .wiff
 - The Method, Output directory and batch have the same name/ directory in Chronos like as in the loaded method of Analyst

MS Method	%METHOD%	String	V	\checkmark	D:\Analyst Data\Projects\API4000-Q Antiretrovirals\Research\Acquisition Methods\2015-04-08 Diclofenac.dam
Output Dir	%DIR%	String	V	V	D:\Analyst Data\Projects\API4000-Q Antiretrovirals\Research\Data\2015-04-08 diclofenac
Batch	%BATCH%	String	V	V	D:\Analyst Data\Projects\API4000-Q Antiretrovirals\Research\Batch\2015-04-08 diclofenac.dab

The batch token was added at extended properties.

• Sample position

Analyst uses a different format for the DBS location:

Properties

Name	Value			
Enabled	True			
Runtime [s]	1			
RespectRuntime	False			
ScheduledAfter	-1			
AcqService	Analyst			
Instrument				
StartDeviceIndex	0			
SoftHandshake	True			
SequenceType				
SampleType	%SAMPTYPE%			
Path	%DIR%			
FileName	%FILE%			
SampleName	%NAME%			
SampleVolume	0			
SampleWeight	0			
InjectionVolume	0			
Position	%RACK%,%CARD%,%SPOT%,1,1			
InstrumentMeth	%METHOD%			
ProcessingMeth	D:\Analyst Data\Projects\API4000-Q Antiretrovirals\Research\Batch\2015-04-07			

• Check Chronos if the acquisition service was integrated (settings/ instrumental)

4.4 Xcalibur coupling

Go to instrument configuration



Configure the LC

强 Thermo Foundation Instrument Configuration	×
Device Types : All	
Available Devices:	Configured Devices:
Themo Scientific SII Q Exactive HF-X -	Thermo Scientific SII Q Exactive HF-X -
for Xcalibur Orbitrap MS	for Xcalibur Orbitrap MS
Add >>	<< Remove Configure
Done	Help

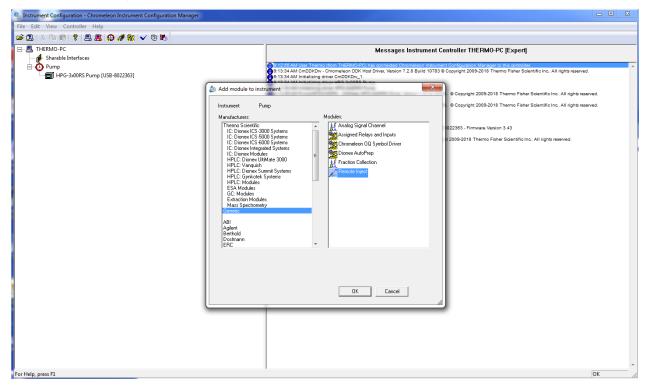
Add the pump:

THERMO-PC	Messages Instrument Controller THERMO-PC [Expert]	
Sharable Interfaces Pump Joan MPG-3x00RS Pump	12.85 AM their Tremes Born 31651/02 EX tas connected Channelines Instrument Conformation Menaged to the combridge 93 13 34 AM CinC/CDV+ Chrometers DCV Krot Drive, Vesion 7.2.8 Build 10783 & Copyright 2009-2018 Thermo Fahre Scientific Inc. All rights re 91 13 4AM Installing drive HVC-bio0050 Pump. 91 13 4AM Installing drive HVC-bio0050 Pump.	
	HPG-3x00RS Configuration	
	General Devices Limits Solvents Signals Pelays Inputs	
	Enabled Name Pump, Inout, 1	
	Punp_hput_2	
	OK Cancel Help	

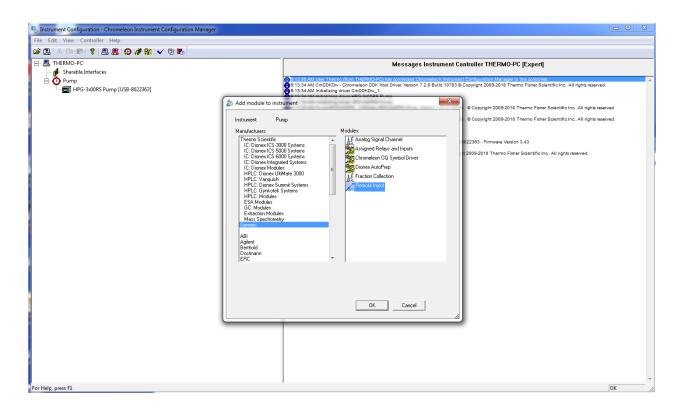
Within the pump setup, select input 1 and Relay 2

HPG-3x00RS Configuration General Devices Limits Solvents Signals Relays Inputs										
General										
Enabled Name										
		Pump_Relay_1								
.0		Pump_Relay_2								
OK Cancel Help										

Add the remote inject task



With inject port 1



With inject port 1

Remote Inject		×
General BCD Position In	nputs	
Device Name:	InjectValve	
Inject Port: Pump_Input_1		•
ОК	Cancel Appl	y Help

	Thermo Foundatio	on Instrument Configuration	×
	Device Types :		
	Available Devices:	Configured Devices:	_
		SII for Xcalibur Configuration	
	Thermo Scientific	Configure Device	
5	for Xcalibur	Please select an instrument system:	
		Controlled by external autosampler	
		OK Cancel Help	
		Add >> Configure	
		Done Help	

Exit the setup and select controlled by external autosampler

Open Xcalibur and program a LC method with inject and a relay tasks:

	Time	Command	Value	Comment
0	▲ {Initial Time}	Instrument Setup	Value	
1		PumpModule.Pump.%A.Equate	"%A"	
2		PumpModule.Pump.%B.Equate	"%B"	
2		PumpModule.Pump.%C.Equate	"%C"	
4		PumpModule.Pump.%D.Equate	"%D"	
5		PumpModule.Pump.Pressure.LowerLimit	0 [bar]	
6		PumpModule.Pump.Pressure.UpperLimit	800 [bar]	
7		PumpModule.Pump.MaximumFlowRampUp	0.101 [ml/min ²]	
8		PumpModule.Pump.MaximumFlowRampDown	9.998 [ml/min ²]	
9	a 0.000	Inject Preparation		
10		Wait	PumpModule.Pump.Ready	
11	a 0.000	Inject		
12		InjectValve.Inject		
13	a 0.000	Start Run		
14		PumpModule.Pump_Relay_2.0n	Duration=10	
15		PumpModule.Pump.Pump_Pressure.AcqOn		
16	a 0.000	Run	Duration = 0.500 [min]	
17		PumpModule.Pump.Flow.Nominal	0.200 [ml/min]	
18		PumpModule.Pump.%B.Value	0.0 [%]	
19		PumpModule.Pump.%C.Value	0.0 [%]	
20		PumpModule.Pump.%D.Value	0.0 [%]	
21		PumpModule.Pump.Curve	5	
22	⊿ 0.500			
23		PumpModule.Pump.Flow.Nominal	0.200 [ml/min]	
24		PumpModule.Pump.%B.Value	0.0 [%]	
25		PumpModule.Pump.%C.Value	0.0 [%]	
26		PumpModule.Pump.%D.Value	0.0 [%]	
27		PumpModule.Pump.Curve	5	
28	▲ 0.500	Stop Run		
29		PumpModule.Pump.Pump_Pressure.AcqOff		
30	End			

• Put the LCMS in a "ready" state:

Status	Acquisition Queue
🔺 Run I	Manager
R	eady to Download
S	equence:
Si	ample Name:
W	/orking On:
P	osition:
R	aw File:
In	ist. Method:
Therr	no Scientific SII for Xcalibur
R	eady to Download
A O Exa	active HF-X - Orbitrap MS

Ready to Download

4) Simulate start signal

- (DBS service tool) Go to Service-> I/O signals-> fluidic-> give signals by activating "Lp Inline"
- If the run starts, be happy if not, try other settings in Xcalibur like:
 - High-to-low edge or Low-to-high edge
 - o Instrument configuration
 - o Contact Thermo service engineer

After this point, you can start working with the instrument by programming independent sample lists in Chronos and in Xcalibur. For full Chronos integration continue further in this guideline.

5) Chronos integration

Use a template method from CAMAG when provided, otherwise:

- Isolate the acquisition task in Chronos method editor (see attached method)
- Select LCMS system and service, Start index must be 1 (due to start instrument information)

Name	Value	Visible	e 4
Enabled	True		
Runtime [s]	30		
RespectRuntime	True		
ScheduledAfter			
AcqService	Xcalibur		
Instrument			1
StartDeviceIndex	1		1
SoftHandshake	False		1
SequenceType			
SampleType	Unknown		
Path	%DIR%		
FileName	%filename%		
SampleName	%FILE%		5
SampleVolume	10		
SampleWeight	0		
InjectionVolume	10		
Position	1		
InstrumentMeth	%METHOD%	V	
ProcessingMeth		V	
CalibrationFile		V	
Level	1	V	
Multiplier	1	\checkmark	
DilutionFactor	1		
ISTDAmount	0		
UpdateRF			
UpdateRT			
UpdateQI			
UpdateMZ			
Comment			
UserName	Thermo		
Password			
Project			۰.

- The filename should have the ending .raw and the method file .meth
- If you manage to send the signal correctly to Xcalibur, import the working acquisition task into a Chronos standard method

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