Loading a Quench Correction Curve on to DOS Operating System

This Applications paper describes how to install quench correction curves on TriCarb liquid scintillation counters in the model number range 1600-2300TR.

Notes

- The quench correction curve is installed on the protocol on which sample analysis is completed
- Generally the Enter key is used to proceed in the software
- The arrow keys will not enter a new value and the previous value is retained even if you have typed in a new value
- On any page there are instructions for what you may enter in the line directly above the function keys

When creating a protocol a series of screens are completed in order to complete. The following describes how each page should be edited and its laid out as each page at a time.

Page 1: Status page (home page)

R	DOSBox	0.74, Cpu speed:	3000 cycles, Fi	rameskip (), Program	: BETA				
Γ	STATUS	PAGE	IDL	E				06-Feb	-13	15:55
	S#	TIME		DP	м	CPM		28%		
		J	REGION A:							
			REGION C:							
Ш		·	Loron C.							
	P#	NAME	Pu	NAM	Е		P#	NAME		
	1	H-3 CPM	11	C-1	4 DPM U	l-G	21			
	2	H-3 DPM U-0	G 12	H-3	∕C-14 D	PM U-G	22			
	3		13	H-3	DPM		23			
	4		14	C-1	4 DPM		24			
	5	Simon Templ	le 15	H–3	∕C−14 D	PM	25	H-3 DPM	U–G	
	6	H-3/C-14 DI	PM U-G 🔰 16				26			
	7		17	Que	nchSet3	H	27			
	8		18	ł			28			
	9		19	l			29			
	10	H-3 DPM U-0	G 20				30	DIRECT	DPM	
	FLAGS:	A = Active,	C = Comple	te, P =	Group	Stat	(PgDn	for Proto	cols	31-60)
	F1-EDIT F6-SPEC	T PROT F2-C CTRUM F7-C	COUNT START GROUP PRIOS	'>STOP TAT	F3-SC F8-COM	CONTROL PUTER O	F4- UTPUT	-DECAY F	5-DA' 10-e1	TE/TIME tc

From the status page, press the F1 key to go to the Edit Protocol page

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Page 2: Edit Protocol Page

DOSBox (0.74, Cpu speed: 3000 cyc	les, Fram:	eskip 0, Program: BETA			• X
EDIT PR	OTOCOL	IDLE			06-Feb-13	15:44
P# 1 2 3 4 5 6 7 8 9 10	NAME H-3 CPM H-3 DPM U-G Simon Temple H-3/C-14 DPM U-G	P# 11 12 13 14 15 16 17 18 19 20	NAME C-14 DPM U-G H-3∕C-14 DPM U-G H-3 DPM C-14 DPM H-3∕C-14 DPM	P# 21 22 23 24 25 26 27 28 29 30	NAME H-3 DPM U-G DIRECT DPM	
Enter	protocol # 1	n the r	range of 1 to 60	(PgDn -	for Protocols	31–60)
F1-STAT	US PAGE F2-CLEAR	ENTRY				

On the Edit Protocol page, enter the number of the protocol you wish to install the quench correction curve on (select number and press Enter key)

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Page 3 – CPM page

The following picture demonstrates how the page would look like for a tritium quench correction curve installation (notes are shown below).

DOSBox 0.74, Cpu speed: 3000 o	cycles, Frameskip 0, Progr	am: BETA	
CPM PAGE	IDLE	06	-Feb-13 15:49
Protocol # = Protocol Name? Cycles? Count Time? 2 Sigma Coincidence?	17 QuenchSet3H 1 30.00 yes	Copy Protocol #?	no
<pre># Counts/Vial? # Vials/Standard? 1st Vial Background? Radionuclide? LL</pre>	Í 1 no 3H UL Bkg	# Vials∕Sample? 2 Sigma% LCR	1
Region A: 0.0 Region B: 2.0 Region C: 0.0	18.6 0.00 18.6 0.00 0.0 0.00	.50 0 .00 0 .00 0	
Qip? % of Reference? Data Mode?	tSIE no dpm	ES Terminator?	count
Please enter Protocol #	to copy in the ra	nge of 1 to 60	
F1-EXIT EDIT F2-CLEAR	ENTRY F3-no F	4-presets F5-PRINT	PROTOCOL

On the CPM page, enter the following information:

- Enter the name of the quench set in Protocol name box, for example for tritium, enter "QuenchSet3H"
- Enter 1 for Cycles
- Enable 2 Sigma Coincidence to Yes by selecting the box and pressing F3
- Set 1st Vial Background is set to No by selecting the box and pressing F2
- Set the Count Time to 30 minutes
- Set the Radionuclide to the isotope you are using by selecting the box and using the appropriate F-key (F2 for 3H / F3 for 14C)
- Set tSIE as the QIP (quench indicating parameter) by selecting the box and pressing F3
- Set the ES terminator to Count by selecting the box and pressing F2
- Set the data mode to dpm by selecting the box and pressing F3

Use Page Down to go to the next page

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Page 4 - DPM Page

The following picture demonstrates how the page would look like for quench correction curve installation (notes are shown below).

DOSBox 0.74, Cpu speed:	3000 cycles, Frameskip 0, Pr	rogram: BETA			
DPM PAGE	IDLE			06-Feb-13	15:51
Protocol # = Standards Data?	17 count	Protocol Constant	Name = Quench?	QuenchSet no	LЗН
# Stds∕Nuclide 1? Nuclide 1:DPM	10 234378				
Please enter Nuclide	e 1 DPM in the range	e of 1 to 999	9999		
F1-EXIT EDIT F2-C	LEAR ENTRY				

On the DPM page, enter the following information:

- Set the Standards Data to count, by selecting the box and pressing F2
- Leave Constant quench as No
- Enter the #Stds/Nuclide 1 enter the value 10 (or the number of standards being used)
- Enter the DPM of the standard in the Nuclide 1: DPM. Half-life correct for short half-life isotopes such as tritium

Press Page Down to get to the next screen

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Page 5 – Additional Features Page

The following picture demonstrates how the page would look like for quench correction curve installation (notes are shown below).



There is no need to change anything on the Additional Features page

Press Page Down to get to the next screen

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Page 6 - Printer Format Page

The following picture demonstrates how the page would look like for quench correction curve installation (notes are shown below).

B DOSI	Box 0.74, C	pu speed: 30	00 cycles	, Frameskip	0, Program:	BETA			- 🗆 🗙
PRIN	t forma	Т						06-Feb-1	3 15:53
Pr	otocol	#· 17	Name	· Quen	-bSet3H				
Ad	ditiona	1 Heading?	Technes	• quen	51106 6511				
C#	Name	Format	C#	Name	Format	C#	Name	Format	Equation
Θ	CRLF	×	11	C:28%	BXX.XX	21	A:2CU	BXXX.XX	-
1	PID	BXXX	12	C:>REF	BXXX.XX	22	B:%CV	BXXX.XX	
2	S#	BXXX	13	SIS	BXX.XXX	23	TOD	BXXXXXXXX	
3	TIME	BXXX.XX	14	DPM1	BXXXX.XX	24			
4	CPMA	BXXXXX.XX	15	DPM2	BXXXXX.XX	25			
5	A:25%	BXX.XX	16	ELTIME	BXXXXXXX	26			
6	A:ZREF	BXXX.XX	17	FLAG	BXXXXX	27			
7	CPMB	BXXXXX XX	18	BLANK	BBBBBBBB	28			
8	B:ZSZ	BXX.XX	19	tSIE	B.XXX	29			
9	BUZKEF	BXXX.XX	20	XLUM	BXXX	30			
10	CPMC	BXXXXX.XX				- 31			
De	fine Ce	11 #? 1	Nam	e?	Format	7		BXXX	
Ea	uation?		(Onera	tors: +	*./.SOR	.LND			
Pr	Print Cells? 2 3 4 13 14 17 0								
Add i	Additional heading (50 chars)								
F1-E	XIT EDI'	T F2–CLE	AR ENT	RY F3-	-PRINT PRO	TOCOL			

There is no need to change anything on the Print Format page

Press Page Down to get to the next screen

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Page 7 – Return to the Edit Protocol Page

Press F1 to exit the protocol and return to the Edit Protocol page

DOSBox (0.74, Cpu speed: 3000 cyc	cles, Fram	eskip 0, Program: BETA					
EDIT PR	OTOCOL	IDLE			06-Feb-13	15:54		
P#	NAME	P#	NAME	P#	NAME			
1	H-3 CPM	11	C-14 DPM U-G	21				
2	H-3 DPM U-G	12	H-3/C-14 DPM U-G	22				
3		13	H-3 DPM	23				
4		14	C-14 DPM	24				
5	Simon Temple	15	H-3/C-14 DPM	25	H-3 DPM U-G			
6	H-3/C-14 DPM U-G	16		26				
7		17	QuenchSet3H	27				
8		18		28				
9		19		29				
10	H-3 DPM U-G	20		30	DIRECT DPM			
Enter	• protocol # 🔢							
Please enter Protocol # in the range of 1 to 60 (PgDn for Protocols 31-60)								
F1-STAT	US PAGE F2-CLEAR	ENTRY						

Page 8 – Return to the Status Page

Press F1 to exit the protocol and return to the Status page

003 803	DOSBox	0.74, Cpu speed: 30	00 cycles, Frame	skip 0, Progra	m: BETA			
	STATUS	PAGE	IDLE				06-Feb-13	15:55
IГ	S#	TIME		DPM	CPM		2S%	
		REG	ION A:					
		REG	ION B:					
		KEG	TON C.					
	Thu:	NAME	7.4	NAME		70.0	NAME	
	1 1	HHTL H_3 CPM	P# 11	C-14 DPM	u_c	21	NHFIL	
	2	H-3 DPM H-G	12	H = 3/C = 14	DPM U-G	22		
	3	11 3 1/11 0 0	13	H-3 DPM	Dilli O G	23		
	4		14	C-14 DPM		24		
	5	Simon Temple	15	H-3/C-14	DPM	25	H-3 DPM U-0	G
	6	H−3/C−14 DPM	U–G 16			26		
	7		17	QuenchSet	:3H	27		
	8		18			28		
	9		19			29		
	10	H-3 DPM U-G	20			30	DIRECT DPM	
	FLAGS :	A = Active, C	= Complete,	P = Group) Stat	(PgDn	for Protocol	s 31–60)
	F1-EDIT F6-SPEC	r prot f2-cou Ctrum f7-gro	NT START/ST UP PRIOSTAT	0P F3-S0 F8-C0	CONTROL	F4- UTPUT	-DECAY F5-DI F10-	ATE/TIME etc

Isotech Services (authors: Clint Croft & Simon Temple) Version 1.0

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Loading the standards

In order to count the standards, complete the following:

- Load the standards in the cassette (rack)
- Put the appropriate protocol flag in the cassette
- Place on the right hand side of the counter table
- Press F2 to start the analysis

Once the standards are analysed the protocol will end and the results and quench correction curve will be printed out.

Quench Curve Data

The quench correction curve data is now located on the DPM Page after completion of the protocol. The following picture demonstrates what it will look like:

DOSBox 0.74, Cpu speed:	3000 cycles, Frameskip 0, Program	n: BETA		×
DPM PAGE			06-Feb-13	16:13
Protocol # = Standards Data? Replot? # Stds/Nuclide 1? Nuclide 1:DPM	25 I use curve C no I O O	Protocol Name = Constant Quench? Edit Stds?	H-3 DPM U- no	G
Qip Eff A 837.9 63.45 733.3 60.07 634.8 56.45 534.3 51.77 438.8 46.58 336.0 38.47 264.2 31.30 200.4 23.85 145.3 16.12 50.37 2.93	Eff B 63.45 60.07 56.45 51.77 46.58 38.47 31.30 23.85 16.12 2.93			
Please select Stand	ards operation by press	ing a function ke	y.	
F1-EXIT EDIT F2-c	ount F3-cycle count	F4-use curve I	5-PRINT PROT	OCOL

The Standards Data box has automatically been updated to state "use curve", which is the correct setting for DPM sample analysis and this protocol is now ready to use.

It can be copied onto another protocol flag number using the Copy Protocol option on the CPM page. This will create a complete copy of the protocol, including the quench correction curves, on the new protocol.

This protocol now has a quench curve and may be used or copied to other protocols for use in acquiring DPM from your samples