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Titrando
PC/LIMS Report Guide

Program version PC Control 1.0
Touch Control 5.808.0110 and 5.809.0110

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Although all the information given in these instructions has been checked with great care, errors cannot be entirely excluded. Should you notice any mistakes please inform the author at the address given above.

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1 Introduction

From PC Control and Touch Control the Titrando system offers the possibility of sending all determination data to a **PC/LIMS Report** file. Please see the Touch Control 808/809 and PC Control Instructions for Use for detailed information. There you will learn how to set up a PC/LIMS connection and how to send a PC/LIMS Report manually and automatically.

The PC/LIMS Report is saved to a single **ASCII file**. It provides all information about the determination and sample data and about the devices and the method used.

The filename consists of a fixed term "PC_LIMS_Report" followed by the title and date & time of the determination. The extension ".txt " shows the ASCII file characteristics.

Example: `PC_LIMS_Report-Titer of NaOH-20020417-120257.txt`

If no determination file name is defined (by default, sample identification 1 is used as file name), this entry is left out in the PC/LIMS Report file name.

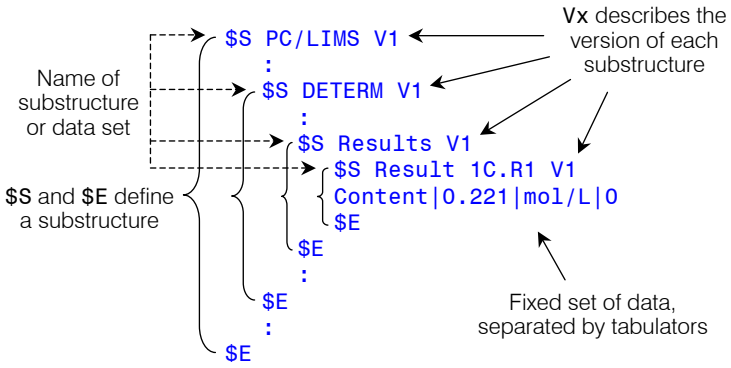
The PC/LIMS Report is best opened and viewed with an editor which allows to see special characters like tabulators and carriage-returns, because all data entries, which are written in one line, are separated by **tabulators**. The number of these tabulators is fixed within one line. If no data exist for a certain entry, it is left empty, but the tabulator is given anyway. **Carriage-returns** separate repeated data sets in a list.

The main structure of the PC/LIMS Report consists of the following information:

- **Title**
- **Device data**
- **Sample data**
- **Measuring point lists**
- **Determination data**
- **Method properties**
- **Method data**

This structure is build of combined substructures, each starting with "$S" and finished by "$E".

Report structure illustration



2 Example report

In this chapter, the structure and content of a PC/LIMS Report is described exemplarily. The PC/LIMS report shown on the following pages was generated from the example result file ***Titer of NaOH*** stored in the group ***Examples*** on ***Card 1***.

In the right column you find the PC/LIMS-Report. The original file was modified with regard to a better readability:

- Indented lines are used to illustrate the structure of such report.
- Within one report line, more than one entries are separated by tabulators. These are illustrated here by a ' | '.
- Some line entries and their comments are listed vertically for lack of space.
- Long data blocks are shortened (e.g. measuring point list).

The left column contains the corresponding description of each entry. It was shortened in the method section of the report.

As this report is just an example, it should not be taken as a complete reference. For this purpose, please see the following chapter 3.

Title	**$S PC/LIMS V1**
Device data	**$S Devices**
Device name	$S device PC Control
Program version|Serial no.	P 1.0|S 3079972211
	$E
Device name	$S device 809 Titrando
Program version|Serial no.	P 5.808.0037|S 00011
Measuring interface	$S ADC1
ADC part no.|Serial no.	ADC 3.770.0110|S 01222
	$E
MSB port	$S MSB1
Connected device	$S 800
Serial no.|Serial no. of dosing unit	S 02122|S 11180169
	$E
Connected device	$S 801
Serial no.	S 01104|
	$E
	$E
	$E
Sample data	**$S Sample data V1**
ID1|ID2|Sample size|Sample unit	Titer of NaOH||0.32864|g
	$E
Measuring point list	**$S MPL V1**
Mode block 1	$S Mode 1
Index|Volume|Measured value|	1|0.00000|4.020|0.0|0.0|25.0
ERC|Time|Temperature	2|0.01000|4.020|6.8|1.9|25.0
:	3|0.02000|4.022|9.3|3.8|25.0
:	:
	:
	:
	56|19.20600|11.585|4.3|291.0|25.0
	57|19.79800|11.657|0.0|294.3|25.0
	58|20.00000|11.680|0.0|297.1|25.0
	$E
	$E
Determination	**$S DETERM V1**
Properties	$S Props V1
Method|	Titer NaOH|
Created by|	Metrohm Herisau|
Created on|	2002-04-16 16:59:40|
Modified by|	|
Modified on + version|	2002-04-16 16:59:40 version 1|
Method status|	saved|
Determination name|	Titer of NaOH|
Determination date & time|	2002-04-17 12:02:57
Determination status|	original loaded saved version 1|
Sample number|	15|
User	Metrohm Herisau
	$E
Results	$S Results V1
Result 1C.R1	$S Result 1C.R1 V1
Name|Value|Unit|CalcErrorNo	Titer|0.9981||0
	$E
	$E

	:
Mode data, Mode 1	$S Mode 1 V1
EP	$S EP V1
EPn|EMn|EFn|EDn|ETn	16.1229|9.082|77.115|206.3|25.0
	$E
Cal	$S Cal V1
	$E
	$E
Other variables	$S Other Variables V1
System	$S System V1
DD|%RN|%SC|%AS|	409.0|15|18|0|
%AC|%AD|%SS|%SL|%SE	||0||
	$E
Mode 1	$S Mode 1 V1
TITER|CONC|MCV|MCD|	0.9984|0.100|20.0000|299.9|
MSV|MIM|MIT|MSM|MST|	0.0000|4.028|25.0|4.020|25.0|
MSD|MCM|MCT|MSA|	2.8|11.680|25.0|0.0000|
MSP|MSS|MEN|MSL|MMP|	0.0000|0.0000|6.828|98.8|58|
-	
	$E
Statistics	$S Statistic V1
SNT|SSD	1|5
Statistic table SMN1	$S SMN1 V1
SMN|SSA|SSR	0.9984|0.00080|0.08
	$E
	$E
Common variables local V1	$S ComVar local V1
	$E
Titrant	$S Titrant V1
Titrant1	$S Titrant1 V1
Name|Conc|Conc unit|	NaOH|0.100|mol/L|
Titer|Titer unit|Method|	0.9984||Titer NaOH|
determination date	2002-04-17 12:09:25
	$E
	$E
Sensor	$S Sensor V1
Sensor1	$S Sensor1 V1
Name|Slope|Offset|	6.0232.100|98.8|6.828|
Temp. meas. type|	(manual)|
Calibration date|	2002-04-17 08:55:57|
Calibration method	New method
	$E
	$E
	$E
Calculation variables	$S Calc Vars V1
Calc1	$S Calc1 V1
Result1	$S R1 V1
C00|Value|	C00|0.32864|
Conc|Value|	CONC|0.100|
EP1|Value|[4]	EP1|16.1229|
	$E
	$E
	$E
Messages	$S Messages V1
	$E
(End of Determination)	**$E**

Method properties	**$S Methodproperties**
Method|Created by|	Titer NaOH|Metrohm Herisau|
Created on|Modified by	2002-04-16 16:59:40||
Modified on|Version|	2002-04-16 16:59:40|version 1|
Method status	saved
	$E
Method	**$S Method V1**
Method options	$S Methodoptions V1
:	on|5|off|Identification 1|
:	Identification 2|
:	on|on|off|1.0|g|off|0|
:	9999999999|off|30 s|on|
:	Titer determination of c(NaOH) = 0.1 mol/L:
:	
:	Dissolve between 0.082 and 0.368 g potassium
:	hydrogen phthalate (dried 2 h at 105°C and
(See section 3.7.1 on page 13 for	cooled down in an exsiccator) in 60 mL
detailed description)	carbonate free dist. water and titrate
:	with c(NaOH) = 0.1 mol/L. Repeat the
:	determination 5 times. The mean value is
: :	saved as titer.
:	Reference: Application Bulletin No. 206, 252|
:	on|on|Card 1|Main group|
:	Identification 1|
:	on|off
	$E
Command number|Command|	$S 01|REQUEST|
Command comment	Data request
(See section 3.7.32 on page 34 for	Identification 1|on|off|off|on
detailed description)	$E
Command number|Command|	$S 02|DET pH|
Command comment	Dynamic pH titration
:	Titrando 1|0.00000 mL|maximum|0 s|
:	off|off|5.00 mL/min|off|0 s|1 s|
:	optimal|4|10.00 µL|off|maximum|
:	50.0 mV/min|0 s|26 s|25.0 °C|
:	20.000 mL|off|9|off|off|maximum|off|
:	5|all|-20.000 pH|off|off|off|off|off|
:	off|off|off|
:	20.000 pH|20.000 pH|20.000 pH|
:	20.000 pH|20.000 pH|20.000 pH|
(See section 3.7.2 on page 13 for	20.000 pH|20.000 pH|20.000 pH|
detailed description)	5|5|5|5|5|5|5|5|
:	first|first|first|first|first|first|
:	first|first|first|0.00000 mL|
:	off|off|off|off|off|off|off|off|
:	9999.99 mL|9999.99 mL|9999.99 mL|
:	9999.99 mL|9999.99 mL|9999.99 mL|
:	9999.99 mL|9999.99 mL|9999.99 mL|
:	5|5|5|5|5|5|5|5|
:	first|first|first|first|first|first|
:	first|first|first|1|6.0232.100|
:	automatic|1|NaOH|1|8|on
	$E

Command number|Command|	$S 03|CALC|Calculation
Command comment	$S R1
:	1|Titer|COO*1000/CONC/204.23/EP1|
:	4||0|Mean value|off|0|on|off|
:	Round|off|invalid|invalid|
:	Display message|
:	The following variables are used:
:	
:	COO= Sample size in g
:	1000= Factor from L to mL
(See section 3.7.29 on page 34	CONC= Concentration of the selected
for detailed description)	titrant in mol/L
:	EP1= Endpoint volume|
:	Enter the following variable:
:	
:	F1= Molar mass for one equivalent of
:	the substance that is determined.
:	
:	Please consider the information
:	in the note under edit result.
	$E
	$E
Command number|Command|	$S 04|REPORT|Report
Command comment	$S Reportoptions V1
:	on each page|off|on
:	$E
:	$S Result report
:	on|on|off|off|on|off|on|on|on|off
(See section 3.7.35 on page 35	$E
for detailed description)	$S Curve
:	2|off|Volume|Meas. value|blue|
:	none|magenta|on|off
:	$E
:	$S Statistics overview
:	at the end of a series
	$E
	$E
(End of Method)	**$E**
(End of PC/LIMS Report)	**$E**

3 Reference

The reference description of all PC/LIMS report entries is partitioned into sections to illustrate the report structure. The name of each report entry cluster is given as a section or table header and may be described by a prefixed term.

In the PC/LIMS report all entries of a entry cluster are given within one line, separated by tabulators. In the following reference, these entries are listed in tables. Each line of these tables contains the entry **number**, the parameter **name** together with special values written in brackets [ ], and the **type** of the entry value.

The type of the entry value can be:

X : checkbox ([on], [off])
IN : integer number
INC : combo box selection from integer number and special value
FN : floating number
FNC : combo box selection from floating number and special value
T : text
TC : combo box selection from text
TA : text area
C : combo box selection
DATE : date & time
BOOL : Boolean type (0, 1)

Example	Description
Vx	Version of the corresponding entry cluster (x = 1, 2, 3,...)
##	Sect. 3.7 Method: line number of method command (## = 01, 02, 03,...99)
MSB# EPn	# and n are replaced by integer numbers; multiple entry clusters of parameters indicated that way are possible.
(MCM)	Corresponding program variables are written in parentheses. See Touch Control and PC Control Instructions for Use, chapter 'Calculations', for a list of all calculation variables.
[off]	For combo box selections, all possible entries are given in squared brackets. If there are special entries for numerical parameters, they are also written in squared brackets.
R1	Many method parameters which contain numerical values may also give result variables (R1...R9) as report entries. See Touch Control and PC Control Instructions for Use: Chapter 'Result Variables as Parameter'.
30 s	Entries from numerical values like integer or floating numbers may also contain the corresponding unit. Otherwise, the unit is given in an additional entry, separated by a tabulator (valid for user defined units, e.g. sample size, result, titrant concentration, titrant titer).

At the end of the reference description you'll find several comments explaining some special versions of report entries.

3.1 Title: PC/LIMS Vx

3.2 Device data: Devices

3.2.1 device PC Control/Touch Control

No.	Parameter description	Type
1	**P** Program version	T
2	**S** Serial number	T

3.2.2 device 809 Titrando/808 Titrando

No.	Parameter description	Type
3	**P** Program version	T
4	**S** Serial number	T

ADC#

No.	Parameter description	Type
1	**ADC** part number	T
2	**S** Serial number	T

MSB#

[685][700][800][801][804][805]

No.	Parameter description	Type
1	**S** Serial number	T
2	**S** Serial number dosing/exchange unit; 800 and 805 only	T

3.3 Sample data: Sample data Vx

No.	Parameter description	Type
1	ID1	T
2	ID2	T
3	Sample size	T
4	Sample unit	T

3.4 Measuring point lists: MPL Vx

Mode #

(Titration **DET**:)

No.	Parameter description	Type
1	Index	IN
2	Volume	FN
3	Measured value	FN
4	ERC	FN
5	Time	FN
6	Temperature	FN

(Titration **MET**:)

No.	Parameter description	Type
1	Index	I
2	Volume	FN
3	Measured value	FN
4	Delta MV	FN
5	Time	FN
6	Temperature	FN

(Titration **SET**:)

No.	Parameter description	Type
1	Index	IN
2	Time	FN
3	Measured value	FN
4	Volume	FN
5	Volume drift	FN
6	Temperature	FN

(Direct measurement **MEAS**: pH, U, T, Ipol, Upol, Conc)

No.	Parameter description	Type
1	Index	IN
2	Volume	FN
3	Measured value	FN
4	Measured value drift	FN
5	Temperature	FN

3.5 Determination: Determ Vx

3.5.1 Properties: Props Vx

No.	Parameter description	Type
1	Method	T
2	Created by	T
3	Created on (dater & time)	date
4	Modified by	T
5	Modified on (dater & time), Method version	T
6	Method status	T
7	Determination name	T
8	Determination date & time	date
9	Determination status	T
10	Sample number	IN
11	User	T

3.5.2 Results Vx

Result #C,R# Vx

No.	Parameter description	Type
1	Name	T
2	Value	FN
3	Unit	T
4	CalcErrorNumber	IN

3.5.3 Mode # Vx

EP Vx

No.	Parameter description	Type
1	Endpoint Volume (EPn) [1]	FN
2	Measured value (EMn)	FN
3	Endpoint recognition criterion ERC (EFn) (SET: EFn=null)	FN
4	Time (EDn)	FN
5	Temperature (ETn)	FN

CAL Vx

No.	Parameter description	Type
1	Buffer / Standard number	IN
2	Buffer pH / Standard concentration	FN
3	Concentration unit / 'pH'	T
4	U	FN
5	Temperature	FN
6	Time	IN

3.5.4 Eval # Vx [2]

No.	Parameter description		Type
1	Volume	(FP# / HP# / XAP / XIP / BP#) [outside]	FN
2	Measured value	(FM# / HM# / XAM / XIM / BM#) [outside]	FN
3	Time	(FD# / HD# / XAD / XID / BD#) [outside]	FN
4	Temperature	(FT# / HT# / XAT / XIT / BT#) [outside]	FN

3.5.5 Other Variables Vx

System V1

No.	Parameter description	Type
1	Determination duration (DD)	FN
2	Sample number (%RN)	IN
3	Start counter (%SC)	IN
4	Autostart status (%AS)	BOOL
5	Autostart counter (%AC)	IN
6	Autostart counter settings (%AD)	IN
7	Sample data silo status (%SS)	BOOL
8	Current silo line (%SL)	IN
9	Silo end reached (%SE) (no entry without silo)	BOOL

Mode # Vx

No.	Parameter description	Type
1	Titer of selected titrant (TITER)	FN
2	Concentration of selected titrant (CONC)	FN
3	End volume (MCV)	FN
4	Total duration of mode (MCD)	FN
5	Total start volume (MSV)	FN
6	Initial measured value (MIM)	FN
7	Initial temperature (MIT)	FN
8	Start measured value (MSM)	FN
9	Start temperature (MST)	FN
10	Duration of start conditions (MSD)	FN
11	Final measured value (MCM)	FN
12	Final temperature (MCT)	FN
13	Volume for start volume (MSA)	FN
14	Volume for start meas.value (MSP)	FN
15	Volume for start slope (MSS)	FN
16	Electrode zero point (MEN)	FN
17	Electrode slope (MSL)	FN
18	Number of meas.points in MP list (MMP)	IN
19	(empty)	T

Statistic Vx

No.	Parameter description	Type
1	Statistics status (SNT)	BOOL
2	Statistics counter settings (SSD)	IN

SMN# Vx (Statistic table)

No.	Parameter description	Type
1	Mean# (SMN#)	FN
2	Abs. standard deviation of SMN# (SSA#)	FN
3	Rel. standard dev. of SMN# in % (SSR#)	FN

ComVar local Vx

No.	Parameter description	Type
1	(spare text, please disregard)	T
2	Index	IN
3	Value	FN

Titrant Vx

Titrant# Vx

No.	Parameter description	Type
1	Titrant	T
2	Concentration	FN
3	Concentration unit	T
4	Titer	FN
5	Titer unit	T
6	Method	T
7	Date & time of titer determination	date

Sensor Vx

Sensor# Vx

(for calibrated pH sensors, otherwise empty entries)[3]

No.	Parameter description	Type
1	Sensor	T
2	Slope	FN
3	pH(0)	FN
4	Temperature measure type	T
5	Calibration date & time	date
6	Calibration method	T

(for calibrated ISE sensors, otherwise empty entries)[3]

No.	Parameter description	Type
1	Sensor	T
2	Slope	FN
3	E(0)	FN
4	c (blank)	FN
5	Temperature measure type	T
6	Calibration date & time	date
7	Calibration method	T

3.5.6 Calc Vars Vx

Calc# Vx

R# Vx

No.	Parameter description	Type
1	Shortname	T
2	Value	FN
3	Shortname	T
4	Value	FN
5	: [4]	FN

3.5.7 Messages Vx

Message Vx

No.	Parameter description	Type
1	Line	IN
2	Name	T
3	Command	T
4	Message number	T
5	Time elapsed since start or recalculation	IN

3.6 Methodproperties

No.	Parameter description	Type
1	Method	T
2	Created by	T
3	Created on (dater & time)	date
4	Modified by	T
5	Modified on (dater & time)	date
6	Version	T
7	Method status	T

3.7 Method Vx

3.7.1 Methodoptions Vx

No.	Parameter description	Type
1	Statistics	X
2	Number of samples	IN
3	Show 'Direct parameters'	X
4	ID 1 title	T
5	ID 2 title	T
6	Display ID 1	X
7	Display ID 2	X
8	Fix sample size	X
9	Sample size	FN
10	Sample size unit	TC
11	Monitoring sample size limits	X
12	Lower limit sample size	FN
13	Upper limit sample size	FN
14	Display message sample size	X
15	Timeout message sample size	FNC
16	Start check	X
17	Note	TA
18	Display Note - Automatically after loading the method	X
19	Save determination automatically	X
20	memory	C
21	Group	TC
22	Filename	TC
23	Write protection	X
24	Send PC/LIMS report	X

3.7.2 ## DET pH Dynamic pH titration

See section 3.7.3.

3.7.3 ## DET U Dynamic U titration

No.	Parameter description	Type
1	Titrando	T
2	Start volume	FN
3	Dosing rate (Start conditions) [maximum]	FNC
4	Pause	IN
5	Start meas. value [off]	FNC
6	Start slope [off]	FNC
7	Dosing rate (More start conditions) [maximum]	FNC
8	Signal drift (Initial measured value) [off]	FNC
9	Waiting time min. (Initial measured value)	IN

10	Waiting time max. (Initial measured value)	IN
11	Titration rate [slow] [optimal] [fast] [user]	C
12	Meas. point density	IN
13	Min. increment	FN
14	Max. increment [off]	FNC
15	Dosing rate (User defined parameters) [maximum]	FNC
16	Signal drift (User defined parameters) [off]	FNC
17	Waiting time min. (User defined parameters)	IN
18	Waiting time max. (User defined parameters)	IN
19	Temperature	FN
20	Stop volume [off]	FNC
21	Stop meas. value [off]	FNC
22	Stop EP [off]	INC
23	Volume after EP [off]	FNC
24	Stop time [off]	INC
25	Filling rate [maximum]	FNC
26	Set windows [off] [measured value] [volume]	C
27	EP criterion	IN
28	EP recognition [all] [greatest] [last] [ascending] [descending] [off]	C
29	Lower limit meas window 1	FN
30	Lower limit meas window 2	FN
31	Lower limit meas window 3	FN
32	Lower limit meas window 4	FN
33	Lower limit meas window 5	FN
34	Lower limit meas window 6	FN
35	Lower limit meas window 7	FN
36	Lower limit meas window 8	FN
37	Lower limit meas window 9	FN
38	Upper limit meas window 1	FN
39	Upper limit meas window 2	FN
40	Upper limit meas window 3	FN
41	Upper limit meas window 4	FN
42	Upper limit meas window 5	FN
43	Upper limit meas window 6	FN
44	Upper limit meas window 7	FN
45	Upper limit meas window 8	FN
46	Upper limit meas window 9	FN
47	EP criterion meas window 1	IN
48	EP criterion meas window 2	IN
49	EP criterion meas window 3	IN
50	EP criterion meas window 4	IN
51	EP criterion meas window 5	IN
52	EP criterion meas window 6	IN
53	EP criterion meas window 7	IN
54	EP criterion meas window 8	IN
55	EP criterion meas window 9	IN
56	EP recognition meas window 1 [first] [greatest] [last] [ascending] [descending]	C
57	EP recognition meas window 2 [first] [greatest] [last] [ascending] [descending]	C
58	EP recognition meas window 3 [first] [greatest] [last] [ascending] [descending]	C
59	EP recognition meas window 4 [first] [greatest] [last] [ascending] [descending]	C
60	EP recognition meas window 5 [first] [greatest] [last] [ascending] [descending]	C
61	EP recognition meas window 6 [first] [greatest] [last] [ascending] [descending]	C

62	EP recognition meas window 7 [first] [greatest] [last] [ascending] [descending]	C
63	EP recognition meas window 8 [first] [greatest] [last] [ascending] [descending]	C
64	EP recognition meas window 9 [first] [greatest] [last] [ascending] [descending]	C
65	Lower limit volume window 1	FN
66	Lower limit volume window 2	FN
67	Lower limit volume window 3	FN
68	Lower limit volume window 4	FN
69	Lower limit volume window 5	FN
70	Lower limit volume window 6	FN
71	Lower limit volume window 7	FN
72	Lower limit volume window 8	FN
73	Lower limit volume window 9	FN
74	Upper limit volume window 1	FN
75	Upper limit volume window 2	FN
76	Upper limit volume window 3	FN
77	Upper limit volume window 4	FN
78	Upper limit volume window 5	FN
79	Upper limit volume window 6	FN
80	Upper limit volume window 7	FN
81	Upper limit volume window 8	FN
82	Upper limit volume window 9	FN
83	EP criterion volume window 1	IN
84	EP criterion volume window 2	IN
85	EP criterion volume window 3	IN
86	EP criterion volume window 4	IN
87	EP criterion volume window 5	IN
88	EP criterion volume window 6	IN
89	EP criterion volume window 7	IN
90	EP criterion volume window 8	IN
91	EP criterion volume window 9	IN
92	EP recognition volume window 1 [first] [greatest] [last] [ascending] [descending]	C
93	EP recognition volume window 2 [first] [greatest] [last] [ascending] [descending]	C
94	EP recognition volume window 3 [first] [greatest] [last] [ascending] [descending]	C
95	EP recognition volume window 4 [first] [greatest] [last] [ascending] [descending]	C
96	EP recognition volume window 5 [first] [greatest] [last] [ascending] [descending]	C
97	EP recognition volume window 6 [first] [greatest] [last] [ascending] [descending]	C
98	EP recognition volume window 7 [first] [greatest] [last] [ascending] [descending]	C
99	EP recognition volume window 8 [first] [greatest] [last] [ascending] [descending]	C
100	EP recognition volume window 9 [first] [greatest] [last] [ascending] [descending]	C
101	Measuring input [1] [2]	C
102	Sensor	T
103	Temp. meas. [continuous] [automatic] [off]	C
104	Dosing device [1] [2] [3] [4]	C
105	Titrant	T
106	Stirrer [1] [2] [3] [4] [off]	C
107	Stirring rate	IN
108	Switch off auto.	X

3.7.4 ## DET Ipol Dynamic Ipol titration

No.	Parameter description	Type
1	Titrando	T
2	Start volume	FN
3	Dosing rate (Start conditions) [maximum]	FNC
4	Pause	IN
5	Start meas. value [off]	FNC
6	Start slope [off]	FNC
7	Dosing rate (More start conditions) [maximum]	FNC
8	Signal drift (Initial measured value) [off]	FNC
9	Waiting time min. (Initial measured value)	IN
10	Waiting time max. (Initial measured value)	IN
11	Titration rate [slow] [optimal] [fast] [user]	C
12	Meas. point density	IN
13	Min. increment	FN
14	Max. increment [off]	FNC
15	Dosing rate (User defined parameters) [maximum]	FNC
16	Signal drift (User defined parameters) [off]	FNC
17	Waiting time min. (User defined parameters)	IN
18	Waiting time max. (User defined parameters)	IN
19	Temperature	FN
20	Stop volume [off]	FNC
21	Stop meas. value [off]	FNC
22	Stop EP [off]	INC
23	Volume after EP [off]	FNC
24	Stop time [off]	INC
25	Filling rate [maximum]	FNC
26	Set windows [off] [measured value] [volume]	C
27	EP criterion	IN
28	EP recognition [all] [greatest] [last] [ascending] [descending] [off]	C
29	Lower limit meas window 1	FN
30	Lower limit meas window 2	FN
31	Lower limit meas window 3	FN
32	Lower limit meas window 4	FN
33	Lower limit meas window 5	FN
34	Lower limit meas window 6	FN
35	Lower limit meas window 7	FN
36	Lower limit meas window 8	FN
37	Lower limit meas window 9	FN
38	Upper limit meas window 1	FN
39	Upper limit meas window 2	FN
40	Upper limit meas window 3	FN
41	Upper limit meas window 4	FN
42	Upper limit meas window 5	FN
43	Upper limit meas window 6	FN
44	Upper limit meas window 7	FN
45	Upper limit meas window 8	FN
46	Upper limit meas window 9	FN
47	EP criterion meas window 1	IN
48	EP criterion meas window 2	IN
49	EP criterion meas window 3	IN

50	EP criterion meas window 4	IN
51	EP criterion meas window 5	IN
52	EP criterion meas window 6	IN
53	EP criterion meas window 7	IN
54	EP criterion meas window 8	IN
55	EP criterion meas window 9	IN
56	EP recognition meas window 1 [first] [greatest] [last] [ascending] [descending]	C
57	EP recognition meas window 2 [first] [greatest] [last] [ascending] [descending]	C
58	EP recognition meas window 3 [first] [greatest] [last] [ascending] [descending]	C
59	EP recognition meas window 4 [first] [greatest] [last] [ascending] [descending]	C
60	EP recognition meas window 5 [first] [greatest] [last] [ascending] [descending]	C
61	EP recognition meas window 6 [first] [greatest] [last] [ascending] [descending]	C
62	EP recognition meas window 7 [first] [greatest] [last] [ascending] [descending]	C
63	EP recognition meas window 8 [first] [greatest] [last] [ascending] [descending]	C
64	EP recognition meas window 9 [first] [greatest] [last] [ascending] [descending]	C
65	Lower limit volume window 1	FN
66	Lower limit volume window 2	FN
67	Lower limit volume window 3	FN
68	Lower limit volume window 4	FN
69	Lower limit volume window 5	FN
70	Lower limit volume window 6	FN
71	Lower limit volume window 7	FN
72	Lower limit volume window 8	FN
73	Lower limit volume window 9	FN
74	Upper limit volume window 1	FN
75	Upper limit volume window 2	FN
76	Upper limit volume window 3	FN
77	Upper limit volume window 4	FN
78	Upper limit volume window 5	FN
79	Upper limit volume window 6	FN
80	Upper limit volume window 7	FN
81	Upper limit volume window 8	FN
82	Upper limit volume window 9	FN
83	EP criterion volume window 1	IN
84	EP criterion volume window 2	IN
85	EP criterion volume window 3	IN
86	EP criterion volume window 4	IN
87	EP criterion volume window 5	IN
88	EP criterion volume window 6	IN
89	EP criterion volume window 7	IN
90	EP criterion volume window 8	IN
91	EP criterion volume window 9	IN
92	EP recognition volume window 1 [first] [greatest] [last] [ascending] [descending]	C
93	EP recognition volume window 2 [first] [greatest] [last] [ascending] [descending]	C
94	EP recognition volume window 3 [first] [greatest] [last] [ascending] [descending]	C
95	EP recognition volume window 4 [first] [greatest] [last] [ascending] [descending]	C
96	EP recognition volume window 5 [first] [greatest] [last] [ascending] [descending]	C
97	EP recognition volume window 6 [first] [greatest] [last] [ascending] [descending]	C
98	EP recognition volume window 7 [first] [greatest] [last] [ascending] [descending]	C
99	EP recognition volume window 8 [first] [greatest] [last] [ascending] [descending]	C
100	EP recognition volume window 9 [first] [greatest] [last] [ascending] [descending]	C

101	Measuring input [1] [2]	C
102	Sensor	T
103	I(pol)	FN
104	Electrode test	X
105	Temp. meas. [continuous] [automatic] [off]	C
106	Dosing device [1] [2] [3] [4]	C
107	Titrant	T
108	Stirrer [1] [2] [3] [4] [off]	C
109	Stirring rate	IN
110	Switch off auto.	X

3.7.5 ## DET Upol Dynamic Upol titration

No.	Parameter description	Type
1	Titrando	T
2	Start volume	FN
3	Dosing rate (Start conditions) [maximum]	FNC
4	Pause	IN
5	Start meas. value [off]	FNC
6	Start slope [off]	FNC
7	Dosing rate (More start conditions) [maximum]	FNC
8	Signal drift (Initial measured value) [off]	FNC
9	Waiting time min. (Initial measured value)	IN
10	Waiting time max. (Initial measured value)	IN
11	Titration rate [slow] [optimal] [fast] [user]	C
12	Meas. point density	IN
13	Min. increment	FN
14	Max. increment [off]	FNC
15	Dosing rate (User defined parameters) [maximum]	FNC
16	Signal drift (User defined parameters) [off]	FNC
17	Waiting time min. (User defined parameters)	IN
18	Waiting time max. (User defined parameters)	IN
19	Temperature	FN
20	Stop volume [off]	FNC
21	Stop meas. value [off]	FNC
22	Stop EP [off]	INC
23	Volume after EP [off]	FNC
24	Stop time [off]	INC
25	Filling rate [maximum]	FNC
26	Set windows [off] [measured value] [volume]	C
27	EP criterion	IN
28	EP recognition [all] [greatest] [last] [ascending] [descending] [off]	C
29	Lower limit meas window 1	FN
30	Lower limit meas window 2	FN
31	Lower limit meas window 3	FN
32	Lower limit meas window 4	FN
33	Lower limit meas window 5	FN
34	Lower limit meas window 6	FN
35	Lower limit meas window 7	FN
36	Lower limit meas window 8	FN
37	Lower limit meas window 9	FN
38	Upper limit meas window 1	FN

39	Upper limit meas window 2	FN
40	Upper limit meas window 3	FN
41	Upper limit meas window 4	FN
42	Upper limit meas window 5	FN
43	Upper limit meas window 6	FN
44	Upper limit meas window 7	FN
45	Upper limit meas window 8	FN
46	Upper limit meas window 9	FN
47	EP criterion meas window 1	IN
48	EP criterion meas window 2	IN
49	EP criterion meas window 3	IN
50	EP criterion meas window 4	IN
51	EP criterion meas window 5	IN
52	EP criterion meas window 6	IN
53	EP criterion meas window 7	IN
54	EP criterion meas window 8	IN
55	EP criterion meas window 9	IN
56	EP recognition meas window 1 [first] [greatest] [last] [ascending] [descending]	C
57	EP recognition meas window 2 [first] [greatest] [last] [ascending] [descending]	C
58	EP recognition meas window 3 [first] [greatest] [last] [ascending] [descending]	C
59	EP recognition meas window 4 [first] [greatest] [last] [ascending] [descending]	C
60	EP recognition meas window 5 [first] [greatest] [last] [ascending] [descending]	C
61	EP recognition meas window 6 [first] [greatest] [last] [ascending] [descending]	C
62	EP recognition meas window 7 [first] [greatest] [last] [ascending] [descending]	C
63	EP recognition meas window 8 [first] [greatest] [last] [ascending] [descending]	C
64	EP recognition meas window 9 [first] [greatest] [last] [ascending] [descending]	C
65	Lower limit volume window 1	FN
66	Lower limit volume window 2	FN
67	Lower limit volume window 3	FN
68	Lower limit volume window 4	FN
69	Lower limit volume window 5	FN
70	Lower limit volume window 6	FN
71	Lower limit volume window 7	FN
72	Lower limit volume window 8	FN
73	Lower limit volume window 9	FN
74	Upper limit volume window 1	FN
75	Upper limit volume window 2	FN
76	Upper limit volume window 3	FN
77	Upper limit volume window 4	FN
78	Upper limit volume window 5	FN
79	Upper limit volume window 6	FN
80	Upper limit volume window 7	FN
81	Upper limit volume window 8	FN
82	Upper limit volume window 9	FN
83	EP criterion volume window 1	IN
84	EP criterion volume window 2	IN
85	EP criterion volume window 3	IN
86	EP criterion volume window 4	IN
87	EP criterion volume window 5	IN
88	EP criterion volume window 6	IN
89	EP criterion volume window 7	IN

90	EP criterion volume window 8	IN
91	EP criterion volume window 9	IN
92	EP recognition volume window 1 [first] [greatest] [last] [ascending] [descending]	C
93	EP recognition volume window 2 [first] [greatest] [last] [ascending] [descending]	C
94	EP recognition volume window 3 [first] [greatest] [last] [ascending] [descending]	C
95	EP recognition volume window 4 [first] [greatest] [last] [ascending] [descending]	C
96	EP recognition volume window 5 [first] [greatest] [last] [ascending] [descending]	C
97	EP recognition volume window 6 [first] [greatest] [last] [ascending] [descending]	C
98	EP recognition volume window 7 [first] [greatest] [last] [ascending] [descending]	C
99	EP recognition volume window 8 [first] [greatest] [last] [ascending] [descending]	C
100	EP recognition volume window 9 [first] [greatest] [last] [ascending] [descending]	C
101	Measuring input [1] [2]	C
102	Sensor	T
103	U(pol)	IN
104	Electrode test	X
105	Temp. meas. [continuous] [automatic] [off]	C
106	Dosing device [1] [2] [3] [4]	C
107	Titrant	T
108	Stirrer [1] [2] [3] [4] [off]	C
109	Stirring rate	IN
110	Switch off auto.	X

3.7.6 ## MET pH Monotonic pH titration

See section 3.7.7.

3.7.7 ## MET U Monotonic U titration

No.	Parameter description	Type
1	Titrando	T
2	Start volume	FN
3	Dosing rate (Start conditions) [maximum]	FNC
4	Pause	IN
5	Start meas. value [off]	FNC
6	Start slope [off]	FNC
7	Dosing rate (More start conditions) [maximum]	FNC
8	Signal drift (Initial measured value) [off]	FNC
9	Waiting time min. (Initial measured value)	IN
10	Waiting time max. (Initial measured value)	IN
11	Titration rate [slow] [optimal] [fast] [user]	C
12	Volume increment	FN
13	Dosing rate (User defined parameters) [maximum]	FNC
14	Signal drift (User defined parameters) [off]	FNC
15	Waiting time min. (User defined parameters)	IN
16	Waiting time max. (User defined parameters)	IN
17	Temperature	FN
18	Stop volume [off]	FNC
19	Stop meas. value [off]	FNC
20	Stop EP [off]	INC
21	Volume after EP [off]	FNC
22	Stop time [off]	INC
23	Filling rate [maximum]	FNC

24	Set windows [off] [measured value] [volume]	C
25	EP criterion	IN
26	EP recognition [all] [greatest] [last] [ascending] [descending] [off]	C
27	Lower limit meas window 1	FN
28	Lower limit meas window 2	FN
29	Lower limit meas window 3	FN
30	Lower limit meas window 4	FN
31	Lower limit meas window 5	FN
32	Lower limit meas window 6	FN
33	Lower limit meas window 7	FN
34	Lower limit meas window 8	FN
35	Lower limit meas window 9	FN
36	Upper limit meas window 1	FN
37	Upper limit meas window 2	FN
38	Upper limit meas window 3	FN
39	Upper limit meas window 4	FN
40	Upper limit meas window 5	FN
41	Upper limit meas window 6	FN
42	Upper limit meas window 7	FN
43	Upper limit meas window 8	FN
44	Upper limit meas window 9	FN
45	EP criterion meas window 1	IN
46	EP criterion meas window 2	IN
47	EP criterion meas window 3	IN
48	EP criterion meas window 4	IN
49	EP criterion meas window 5	IN
50	EP criterion meas window 6	IN
51	EP criterion meas window 7	IN
52	EP criterion meas window 8	IN
53	EP criterion meas window 9	IN
54	EP recognition meas window 1 [first] [greatest] [last] [ascending] [descending]	C
55	EP recognition meas window 2 [first] [greatest] [last] [ascending] [descending]	C
56	EP recognition meas window 3 [first] [greatest] [last] [ascending] [descending]	C
57	EP recognition meas window 4 [first] [greatest] [last] [ascending] [descending]	C
58	EP recognition meas window 5 [first] [greatest] [last] [ascending] [descending]	C
59	EP recognition meas window 6 [first] [greatest] [last] [ascending] [descending]	C
60	EP recognition meas window 7 [first] [greatest] [last] [ascending] [descending]	C
61	EP recognition meas window 8 [first] [greatest] [last] [ascending] [descending]	C
62	EP recognition meas window 9 [first] [greatest] [last] [ascending] [descending]	C
63	Lower limit volume window 1	FN
64	Lower limit volume window 2	FN
65	Lower limit volume window 3	FN
66	Lower limit volume window 4	FN
67	Lower limit volume window 5	FN
68	Lower limit volume window 6	FN
69	Lower limit volume window 7	FN
70	Lower limit volume window 8	FN
71	Lower limit volume window 9	FN
72	Upper limit volume window 1	FN
73	Upper limit volume window 2	FN
74	Upper limit volume window 3	FN

75	Upper limit volume window 4	FN
76	Upper limit volume window 5	FN
77	Upper limit volume window 6	FN
78	Upper limit volume window 7	FN
79	Upper limit volume window 8	FN
80	Upper limit volume window 9	FN
81	EP criterion volume window 1	IN
82	EP criterion volume window 2	IN
83	EP criterion volume window 3	IN
84	EP criterion volume window 4	IN
85	EP criterion volume window 5	IN
86	EP criterion volume window 6	IN
87	EP criterion volume window 7	IN
88	EP criterion volume window 8	IN
89	EP criterion volume window 9	IN
90	EP recognition volume window 1 [first] [greatest] [last] [ascending] [descending]	C
91	EP recognition volume window 2 [first] [greatest] [last] [ascending] [descending]	C
92	EP recognition volume window 3 [first] [greatest] [last] [ascending] [descending]	C
93	EP recognition volume window 4 [first] [greatest] [last] [ascending] [descending]	C
94	EP recognition volume window 5 [first] [greatest] [last] [ascending] [descending]	C
95	EP recognition volume window 6 [first] [greatest] [last] [ascending] [descending]	C
96	EP recognition volume window 7 [first] [greatest] [last] [ascending] [descending]	C
97	EP recognition volume window 8 [first] [greatest] [last] [ascending] [descending]	C
98	EP recognition volume window 9 [first] [greatest] [last] [ascending] [descending]	C
99	Measuring input [1] [2]	C
100	Sensor	T
101	Temp. meas. [continuous] [automatic] [off]	C
102	Dosing device [1] [2] [3] [4]	C
103	Titrant	T
104	Stirrer [1] [2] [3] [4] [off]	C
105	Stirring rate	IN
106	Switch off auto.	X

3.7.8 ## MET Ipol Monotonic Ipol titration

No.	Parameter description	Type
1	Titrando	T
2	Start volume	FN
3	Dosing rate (Start conditions) [maximum]	FNC
4	Pause	IN
5	Start meas. value [off]	FNC
6	Start slope [off]	FNC
7	Dosing rate (More start conditions) [maximum]	FNC
8	Signal drift (Initial measured value) [off]	FNC
9	Waiting time min. (Initial measured value)	IN
10	Waiting time max. (Initial measured value)	IN
11	Titration rate [slow] [optimal] [fast] [user]	C
12	Volume increment	FN
13	Dosing rate (User defined parameters) [maximum]	FNC
14	Signal drift (User defined parameters) [off]	FNC
15	Waiting time min. (User defined parameters)	IN
16	Waiting time max. (User defined parameters)	IN

17	Temperature	FN
18	Stop volume [off]	FNC
19	Stop meas. value [off]	FNC
20	Stop EP [off]	INC
21	Volume after EP [off]	FNC
22	Stop time [off]	INC
23	Filling rate [maximum]	FNC
24	Set windows [off] [measured value] [volume]	C
25	EP criterion	IN
26	EP recognition [all] [greatest] [last] [ascending] [descending] [off]	C
27	Lower limit meas window 1	FN
28	Lower limit meas window 2	FN
29	Lower limit meas window 3	FN
30	Lower limit meas window 4	FN
31	Lower limit meas window 5	FN
32	Lower limit meas window 6	FN
33	Lower limit meas window 7	FN
34	Lower limit meas window 8	FN
35	Lower limit meas window 9	FN
36	Upper limit meas window 1	FN
37	Upper limit meas window 2	FN
38	Upper limit meas window 3	FN
39	Upper limit meas window 4	FN
40	Upper limit meas window 5	FN
41	Upper limit meas window 6	FN
42	Upper limit meas window 7	FN
43	Upper limit meas window 8	FN
44	Upper limit meas window 9	FN
45	EP criterion meas window 1	IN
46	EP criterion meas window 2	IN
47	EP criterion meas window 3	IN
48	EP criterion meas window 4	IN
49	EP criterion meas window 5	IN
50	EP criterion meas window 6	IN
51	EP criterion meas window 7	IN
52	EP criterion meas window 8	IN
53	EP criterion meas window 9	IN
54	EP recognition meas window 1 [first] [greatest] [last] [ascending] [descending]	C
55	EP recognition meas window 2 [first] [greatest] [last] [ascending] [descending]	C
56	EP recognition meas window 3 [first] [greatest] [last] [ascending] [descending]	C
57	EP recognition meas window 4 [first] [greatest] [last] [ascending] [descending]	C
58	EP recognition meas window 5 [first] [greatest] [last] [ascending] [descending]	C
59	EP recognition meas window 6 [first] [greatest] [last] [ascending] [descending]	C
60	EP recognition meas window 7 [first] [greatest] [last] [ascending] [descending]	C
61	EP recognition meas window 8 [first] [greatest] [last] [ascending] [descending]	C
62	EP recognition meas window 9 [first] [greatest] [last] [ascending] [descending]	C
63	Lower limit volume window 1	FN
64	Lower limit volume window 2	FN
65	Lower limit volume window 3	FN
66	Lower limit volume window 4	FN
67	Lower limit volume window 5	FN

68	Lower limit volume window 6	FN
69	Lower limit volume window 7	FN
70	Lower limit volume window 8	FN
71	Lower limit volume window 9	FN
72	Upper limit volume window 1	FN
73	Upper limit volume window 2	FN
74	Upper limit volume window 3	FN
75	Upper limit volume window 4	FN
76	Upper limit volume window 5	FN
77	Upper limit volume window 6	FN
78	Upper limit volume window 7	FN
79	Upper limit volume window 8	FN
80	Upper limit volume window 9	FN
81	EP criterion volume window 1	IN
82	EP criterion volume window 2	IN
83	EP criterion volume window 3	IN
84	EP criterion volume window 4	IN
85	EP criterion volume window 5	IN
86	EP criterion volume window 6	IN
87	EP criterion volume window 7	IN
88	EP criterion volume window 8	IN
89	EP criterion volume window 9	IN
90	EP recognition volume window 1 [first] [greatest] [last] [ascending] [descending]	C
91	EP recognition volume window 2 [first] [greatest] [last] [ascending] [descending]	C
92	EP recognition volume window 3 [first] [greatest] [last] [ascending] [descending]	C
93	EP recognition volume window 4 [first] [greatest] [last] [ascending] [descending]	C
94	EP recognition volume window 5 [first] [greatest] [last] [ascending] [descending]	C
95	EP recognition volume window 6 [first] [greatest] [last] [ascending] [descending]	C
96	EP recognition volume window 7 [first] [greatest] [last] [ascending] [descending]	C
97	EP recognition volume window 8 [first] [greatest] [last] [ascending] [descending]	C
98	EP recognition volume window 9 [first] [greatest] [last] [ascending] [descending]	C
99	Measuring input [1] [2]	C
100	Sensor	T
101	I(pol)	FN
102	Electrode test	X
103	Temp. meas. [continuous] [automatic] [off]	C
104	Dosing device [1] [2] [3] [4]	C
105	Titrant	T
106	Stirrer [1] [2] [3] [4] [off]	C
107	Stirring rate	IN
108	Switch off auto.	X

3.7.9 ## MET Upol Monotonic Upol titration

No.	Parameter description	Type
1	Titrando	T
2	Start volume	FN
3	Dosing rate (Start conditions) [maximum]	FNC
4	Pause	IN
5	Start meas. value [off]	FNC
6	Start slope [off]	FNC

7	Dosing rate (More start conditions) [maximum]	FNC
8	Signal drift (Initial measured value) [off]	FNC
9	Waiting time min. (Initial measured value)	IN
10	Waiting time max. (Initial measured value)	IN
11	Titration rate [slow] [optimal] [fast] [user]	C
12	Volume increment	FN
13	Dosing rate (User defined parameters) [maximum]	FNC
14	Signal drift (User defined parameters) [off]	FNC
15	Waiting time min. (User defined parameters)	IN
16	Waiting time max. (User defined parameters)	IN
17	Temperature	FN
18	Stop volume [off]	FNC
19	Stop meas. value [off]	FNC
20	Stop EP [off]	INC
21	Volume after EP [off]	FNC
22	Stop time [off]	INC
23	Filling rate [maximum]	FNC
24	Set windows [off] [measured value] [volume]	C
25	EP criterion	IN
26	EP recognition [all] [greatest] [last] [ascending] [descending] [off]	C
27	Lower limit meas window 1	FN
28	Lower limit meas window 2	FN
29	Lower limit meas window 3	FN
30	Lower limit meas window 4	FN
31	Lower limit meas window 5	FN
32	Lower limit meas window 6	FN
33	Lower limit meas window 7	FN
34	Lower limit meas window 8	FN
35	Lower limit meas window 9	FN
36	Upper limit meas window 1	FN
37	Upper limit meas window 2	FN
38	Upper limit meas window 3	FN
39	Upper limit meas window 4	FN
40	Upper limit meas window 5	FN
41	Upper limit meas window 6	FN
42	Upper limit meas window 7	FN
43	Upper limit meas window 8	FN
44	Upper limit meas window 9	FN
45	EP criterion meas window 1	IN
46	EP criterion meas window 2	IN
47	EP criterion meas window 3	IN
48	EP criterion meas window 4	IN
49	EP criterion meas window 5	IN
50	EP criterion meas window 6	IN
51	EP criterion meas window 7	IN
52	EP criterion meas window 8	IN
53	EP criterion meas window 9	IN
54	EP recognition meas window 1 [first] [greatest] [last] [ascending] [descending]	C
55	EP recognition meas window 2 [first] [greatest] [last] [ascending] [descending]	C
56	EP recognition meas window 3 [first] [greatest] [last] [ascending] [descending]	C
57	EP recognition meas window 4 [first] [greatest] [last] [ascending] [descending]	C
58	EP recognition meas window 5 [first] [greatest] [last] [ascending] [descending]	C

59	EP recognition meas window 6 [first] [greatest] [last] [ascending] [descending]	C
60	EP recognition meas window 7 [first] [greatest] [last] [ascending] [descending]	C
61	EP recognition meas window 8 [first] [greatest] [last] [ascending] [descending]	C
62	EP recognition meas window 9 [first] [greatest] [last] [ascending] [descending]	C
63	Lower limit volume window 1	FN
64	Lower limit volume window 2	FN
65	Lower limit volume window 3	FN
66	Lower limit volume window 4	FN
67	Lower limit volume window 5	FN
68	Lower limit volume window 6	FN
69	Lower limit volume window 7	FN
70	Lower limit volume window 8	FN
71	Lower limit volume window 9	FN
72	Upper limit volume window 1	FN
73	Upper limit volume window 2	FN
74	Upper limit volume window 3	FN
75	Upper limit volume window 4	FN
76	Upper limit volume window 5	FN
77	Upper limit volume window 6	FN
78	Upper limit volume window 7	FN
79	Upper limit volume window 8	FN
80	Upper limit volume window 9	FN
81	EP criterion volume window 1	IN
82	EP criterion volume window 2	IN
83	EP criterion volume window 3	IN
84	EP criterion volume window 4	IN
85	EP criterion volume window 5	IN
86	EP criterion volume window 6	IN
87	EP criterion volume window 7	IN
88	EP criterion volume window 8	IN
89	EP criterion volume window 9	IN
90	EP recognition volume window 1 [first] [greatest] [last] [ascending] [descending]	C
91	EP recognition volume window 2 [first] [greatest] [last] [ascending] [descending]	C
92	EP recognition volume window 3 [first] [greatest] [last] [ascending] [descending]	C
93	EP recognition volume window 4 [first] [greatest] [last] [ascending] [descending]	C
94	EP recognition volume window 5 [first] [greatest] [last] [ascending] [descending]	C
95	EP recognition volume window 6 [first] [greatest] [last] [ascending] [descending]	C
96	EP recognition volume window 7 [first] [greatest] [last] [ascending] [descending]	C
97	EP recognition volume window 8 [first] [greatest] [last] [ascending] [descending]	C
98	EP recognition volume window 9 [first] [greatest] [last] [ascending] [descending]	C
99	Measuring input [1] [2]	C
100	Sensor	T
101	U(pol)	IN
102	Electrode test	X
103	Temp. meas. [continuous] [automatic] [off]	C
104	Dosing device [1] [2] [3] [4]	C
105	Titrant	T
106	Stirrer [1] [2] [3] [4] [off]	C
107	Stirring rate	IN
108	Switch off auto.	X

3.7.10 ## SET pH Set endpoint titration pH

No.	Parameter description	Type
1	Titrando	T
2	Signal drift [off]	FNC
3	Waiting time min.	IN
4	Waiting time max.	IN
5	Start volume	FN
6	Dosing rate [maximum]	FNC
7	Pause 1	IN
8	Pause 2	IN
9	EP1 at pH [off]	FNC
10	Titration rate (EP1) [slow] [optimal] [fast] [user]	C
11	Dynamics (EP1) [off]	FNC
12	Max. rate (EP1) [maximum]	FNC
13	Min. rate (EP1)	FN
14	Stop criterion (EP1) [drift] [time] [none]	C
15	Stop drift (EP1)	IN
16	Delay time (EP1)	IN
17	EP2 at pH [off]	FNC
18	Titration rate (EP2) [slow] [optimal] [fast] [user]	C
19	Dynamics (EP2) [off]	FNC
20	Max. rate (EP2) [maximum]	FNC
21	Min. rate (EP2)	FN
22	Stop criterion (EP2) [drift] [time] [none]	C
23	Stop drift (EP2)	IN
24	Delay time (EP2)	IN
25	Titration direction [+] [-] [auto]	C
26	Extraction time	IN
27	Temperature	FN
28	Time interval MP	FN
29	Stop volume [off]	FNC
30	Stop time [off]	INC
31	Filling rate [maximum]	FNC
32	condition [5]	X
33	condition drift correction [5]	C
34	condition drift val [5]	FNC
35	Measuring input [1] [2]	C
36	Sensor	T
37	Temp. meas. [continuous] [automatic] [off]	C
38	Dosing device [1] [2] [3] [4]	C
39	Titrant	T
40	Stirrer [1] [2] [3] [4] [off]	C
41	Stirring rate	IN
42	Switch off auto.	X

3.7.11 ## SET U Set endpoint titration U

No.	Parameter description	Type
1	Titrando	T
2	Signal drift [off]	FNC
3	Waiting time min.	IN
4	Waiting time max.	IN
5	Start volume	FN
6	Dosing rate [maximum]	FNC
7	Pause 1	IN
8	Pause 2	IN
9	EP1 at U [off]	FNC
10	Titration rate (EP1) [slow] [optimal] [fast] [user]	C
11	Dynamics (EP1) [off]	FNC
12	Max. rate (EP1) [maximum]	FNC
13	Min. rate (EP1)	FN
14	Stop criterion (EP1) [drift] [time] [none]	C
15	Stop drift (EP1)	IN
16	Delay time (EP1)	IN
17	EP2 at U [off]	FNC
18	Titration rate (EP2) [slow] [optimal] [fast] [user]	C
19	Dynamics (EP2) [off]	FNC
20	Max. rate (EP2) [maximum]	FNC
21	Min. rate (EP2)	FN
22	Stop criterion (EP2) [drift] [time] [none]	C
23	Stop drift (EP2)	IN
24	Delay time (EP2)	IN
25	Titration direction [+] [-] [auto]	C
26	Extraction time	IN
27	Temperature	FN
28	Time interval MP	FN
29	Stop volume [off]	FNC
30	Stop time [off]	INC
31	Filling rate [maximum]	FNC
32	condition [5]	X
33	condition drift correction [5]	C
34	condition drift val [5]	FNC
35	Measuring input [1] [2]	C
36	Sensor	T
37	Temp. meas. [continuous] [automatic] [off]	C
38	Dosing device [1] [2] [3] [4]	C
39	Titrant	T
40	Stirrer [1] [2] [3] [4] [off]	C
41	Stirring rate	IN
42	Switch off auto.	X

3.7.12 ## SET Ipol Set endpoint titration Ipol

No.	Parameter description	Type
1	Titrando	T
2	Signal drift [off]	FNC
3	Waiting time min.	IN
4	Waiting time max.	IN
5	Start volume	FN
6	Dosing rate [maximum]	FNC
7	Pause 1	IN
8	Pause 2	IN
9	EP1 at U [off]	FNC
10	Titration rate (EP1) [slow] [optimal] [fast] [user]	C
11	Dynamics (EP1) [off]	FNC
12	Max. rate (EP1) [maximum]	FNC
13	Min. rate (EP1)	FN
14	Stop criterion (EP1) [drift] [time] [none]	C
15	Stop drift (EP1)	IN
16	Delay time (EP1)	IN
17	EP2 at U [off]	FNC
18	Titration rate (EP2) [slow] [optimal] [fast] [user]	C
19	Dynamics (EP2) [off]	FNC
20	Max. rate (EP2) [maximum]	FNC
21	Min. rate (EP2)	FN
22	Stop criterion (EP2) [drift] [time] [none]	C
23	Stop drift (EP2)	IN
24	Delay time (EP2)	IN
25	Titration direction [+] [-] [auto]	C
26	Extraction time	IN
27	Temperature	FN
28	Time interval MP	FN
29	Stop volume [off]	FNC
30	Stop time [off]	INC
31	Filling rate [maximum]	FNC
32	condition [5]	X
33	condition drift correction [5]	C
34	condition drift val [5]	FNC
35	Measuring input [1] [2]	C
36	Sensor	T
37	I(pol)	FN
38	Electrode test	X
39	Temp. meas. [continuous] [automatic] [off]	C
40	Dosing device [1] [2] [3] [4]	C
41	Titrant	T
42	Stirrer [1] [2] [3] [4] [off]	C
43	Stirring rate	IN
44	Switch off auto.	X

3.7.13 ## SET Upol Set endpoint titration Upol

No.	Parameter description	Type
1	Titrando	T
2	Signal drift [off]	FNC
3	Waiting time min.	IN
4	Waiting time max.	IN
5	Start volume	FN
6	Dosing rate [maximum]	FNC
7	Pause 1	IN
8	Pause 2	IN
9	EP1 at I [off]	FNC
10	Titration rate (EP1) [slow] [optimal] [fast] [user]	C
11	Dynamics (EP1) [off]	FNC
12	Max. rate (EP1) [maximum]	FNC
13	Min. rate (EP1)	FN
14	Stop criterion (EP1) [drift] [time] [none]	C
15	Stop drift (EP1)	IN
16	Delay time (EP1)	IN
17	EP2 at I [off]	FNC
18	Titration rate (EP2) [slow] [optimal] [fast] [user]	C
19	Dynamics (EP2) [off]	FNC
20	Max. rate (EP2) [maximum]	FNC
21	Min. rate (EP2)	FN
22	Stop criterion (EP2) [drift] [time] [none]	C
23	Stop drift (EP2)	IN
24	Delay time (EP2)	IN
25	Titration direction [+] [-] [auto]	C
26	Extraction time	IN
27	Temperature	FN
28	Time interval MP	FN
29	Stop volume [off]	FNC
30	Stop time [off]	INC
31	Filling rate [maximum]	FNC
32	condition [5]	X
33	condition drift correction [5]	C
34	condition drift val [5]	FNC
35	Measuring input [1] [2]	C
36	Sensor	T
37	U(pol)	IN
38	Electrode test	X
39	Temp. meas. [continuous] [automatic] [off]	C
40	Dosing device [1] [2] [3] [4]	C
41	Titrant	T
42	Stirrer [1] [2] [3] [4] [off]	C
43	Stirring rate	IN
44	Switch off auto.	X

3.7.14 ## MEAS pH pH measurement

See section 3.7.16.

3.7.15 ## MEAS U Potential measurement

See section 3.7.16.

3.7.16 ## MEAS Conc Concentration measurement

No.	Parameter description	Type
1	Titrando	T
2	Signal drift [off]	FNC
3	Waiting time min.	IN
4	Waiting time max. [off]	INC
5	Stop meas. value [off]	FNC
6	Temperature	FN
7	Time interval MP	FN
8	Measuring input [1] [2]	C
9	Sensor	T
10	Temp. meas. [continuous] [automatic] [off]	C
11	Stirrer [1] [2] [3] [4] [off]	C
12	Stirring rate	IN
13	Switch off auto.	X

3.7.17 ## MEAS Ipol Potential measurement w. Ipol

No.	Parameter description	Type
1	Titrando	T
2	Signal drift [off]	FNC
3	Waiting time min.	IN
4	Waiting time max. [off]	INC
5	Stop meas. value [off]	FNC
6	Temperature	FN
7	Time interval MP	FN
8	Measuring input [1] [2]	C
9	Sensor	T
10	Temp. meas. [continuous] [automatic] [off]	C
11	I(pol)	FN
12	Electrode test	X
13	Stirrer [1] [2] [3] [4] [off]	C
14	Stirring rate	IN
15	Switch off auto.	X

3.7.18 ## MEAS Upol Current measurement with Upol

No.	Parameter description	Type
1	Titrando	T
2	Signal drift [off]	FNC
3	Waiting time min.	IN
4	Waiting time max. [off]	INC
5	Stop meas. value [off]	FNC
6	Temperature	FN
7	Time interval MP	FN
8	Measuring input [1] [2]	C
9	Sensor	T
10	Temp. meas. [continuous] [automatic] [off]	C
11	U(pol)	IN
12	Electrode test	X
13	Stirrer [1] [2] [3] [4] [off]	C
14	Stirring rate	IN
15	Switch off auto.	X

3.7.19 ## MEAS T Temperature measurement

No.	Parameter description	Type
1	Titrando	T
2	Signal drift [off]	FNC
3	Waiting time min.	IN
4	Waiting time max. [off]	INC
5	Stop meas. value [off]	FNC
6	Time interval MP	FN
7	Measuring input [1] [2]	C
8	Sensor	T
9	Stirrer [1] [2] [3] [4] [off]	C
10	Stirring rate	IN
11	Switch off auto.	X

3.7.20 ## ADD Dosing

No.	Parameter description	Type
1	Titrando	T
2	Volume	FN
3	Dosing rate [maximum]	FNC
4	Filling rate [maximum]	FNC
5	Dosing device [1] [2] [3] [4]	C
6	Stirrer [1] [2] [3] [4] [off]	C
7	Stirring rate	IN
8	Switch off auto.	X
9	Titrant	T

3.7.21 ## PREP Prepare

No.	Parameter description	Type
1	Titrando	T
2	Dosing device [1] [2] [3] [4]	C
3	Titrant	T

3.7.22 ## EMPTY Empty Dosino

No.	Parameter description	Type
1	Titrando	T
2	Dosing device [1] [2] [3] [4]	C
3	Titrant	T

3.7.23 ## EVAL FIX-EP Evaluation fix endpoints

No.	Parameter description	Type
1	Meas unit	T
2	Fixed quantity [measured value] [time] [volume]	C
3	Fix EP1 at [off]	FNC
4	Fix EP2 at [off]	FNC
5	Fix EP3 at [off]	FNC
6	Fix EP4 at [off]	FNC
7	Fix EP5 at [off]	FNC
8	Fix EP6 at [off]	FNC
9	Fix EP7 at [off]	FNC
10	Fix EP8 at [off]	FNC
11	Fix EP9 at [off]	FNC

3.7.24 ## EVAL MIN/MAX Evaluation of minimum/maximum

No.	Parameter description	Type
1	Meas unit	T
2	Evaluation [minimum] [maximum]	C
3	Threshold value	FN

3.7.25 ## EVAL BREAK Breakpoint evaluation

No.	Parameter description	Type
1	Meas unit	T
2	EP criterion	FN
3	Slope	FN
4	Smoothing factor	IN
5	Set windows [measured value] [time] [volume]	C
6	Lower limit	FN
7	Upper limit	FN

3.7.26 ## EVAL pK/HNP Evaluation pK/HNP

no parameters

3.7.27 ## SCAN Wait for remote signal

No.	Parameter description	Type
1	Titrando	T
2	Remote box [1] [2] [3] [4]	C
3	Input signal	T

3.7.28 ## CTRL Send remote signal

No.	Parameter description	Type
1	Titrando	T
2	Remote box [1] [2] [3] [4]	C
3	Output signal	T
4	Pulse length for "p"	IN

3.7.29 ## CALC Calculation

R#

No.	Parameter description	Type
1	Result variable	IN
2	Result name	T
3	Calc. formula Rn	T
4	Decimal places	IN
5	Result unit	TC
6	Variable for mean [0],[1],[2]...[9] => (SMN1...SMN9, off)	IN
7	Save result as titer [Single value] [Mean value] [off]	C
8	Save result as common variable	X
9	Variable [0],[1],[2]...[24] => (CV01...CV25)	IN
10	Display result	X
11	Save result in result silo	X
12	Precision [Round] [Truncate] [Full precision]	C
13	Monitoring result limits	X
14	Lower limit	FN
15	Upper limit	FN
16	Action [Display message] [Document message] [Cancel determination]	C
17	Note	T
18	Note for wizard	T

3.7.30 ## STIR Stir

No.	Parameter description	Type
1	Titrando	T
2	Stirrer [1] [2] [3] [4]	C
3	Switch	X
4	Stirring rate	IN

3.7.31 ## WAIT Wait

No.	Parameter description	Type
1	Waiting time	IN
2	Message text	T
3	Hold sequence	X
4	Message	X

3.7.32 ## REQUEST Data request

No.	Parameter description	Type
1	Sample ident. [off] [Identification 1] [Identification 2] [id 1 & id 2]	C
2	Sample size	X
3	Sample unit	X
4	Common variable [0],[1],[2]...[24],[off] => (CV01...CV25, off)	INC
5	Hold sequence	X

3.7.33 ## BEEP Acoustic signal

No.	Parameter description	Type
1	Number of sounds	IN

3.7.34 ## END End

no parameters

3.7.35 ## REPORT Report

Reportoptions Vx

No.	Parameter description	Type
1	Report header [off] [once] [on each page]	C
2	Signature line [off] [once] [on each page]	C
3	Frame	X

Result report

No.	Parameter description	Type
1	Determination properties	X
2	Sample data	X
3	Sensor data	X
4	Titrant data	X
5	Raw data	X
6	Used common variables	X
7	Results	X
8	Statistics short	X
9	Messages	X
10	Line between sections	X

Curve

No.	Parameter description	Type
1	Mode	IN
2	Determination properties	X
3	x axis [Meas. value] [Time] [Temperature] [M drift] [Volume] [V drift] [ERC] [Delta MV]	C
4	y1 axis [Meas. value] [Time] [Temperature] [M drift] [Volume] [V drift] [ERC] [Delta MV]	C
5	Color y1 [black] [red] [green] [yellow] [blue] [magenta] [cyan] [grey]	C
6	y2 axis [Meas. value] [Time] [Temperature] [M drift] [Volume] [V drift] [ERC] [Delta MV] [none]	C
7	Color y2 [black] [red] [green] [yellow] [blue] [magenta] [cyan] [grey]	C
8	Grid	X
9	Display measured values	X

Measuring point list

No.	Parameter description	Type
1	Mode	IN
2	Determination properties	X

Calculations

No.	Parameter description	Type
1	Determination properties	X
2	Precision [full] [as displayed]	C

Statistics short

No.	Parameter description	Type
1	Printout [for each determination] [at the end of a series]	C

Statistics overview

No.	Parameter description	Type
1	Printout [for each determination] [at the end of a series]	C

Used device

No.	Parameter description	Type
1	Determination properties	X

The following Report Commands do not contain any parameters.

Form feed

Method sequence

Parameters full

Titration & measuring param.

Modified parameters

Non default parameters

System settings

Dialog options

Titrant list

All titrant data short

All titrant data full

Sensor list

All sensor data short

All sensor data full

Device list

All device properties

GLP data

Common variable list

All common variable properties

Templates sample data

Result template list

All result templates details

Input/Output lines

Custom calibration buffers

3.7.36 ## CAL pH pH calibration

No.	Parameter description	Type
1	Titrando	T
2	Signal drift [off]	FNC
3	Waiting time min.	IN
4	Waiting time max. [off]	INC
5	Temperature	FN
6	Sample changer	X
7	Buffer type [Metrohm] [NIST] [DIN] [Fisher] [Novartis] [Mettler] [Merck] [Beckman] [Radiometer] [Custom] [Special]	C
8	Number of buffers	IN
9	Buffer 1 pH	FN
10	Buffer 2 pH [off]	FNC
11	Buffer 3 pH [off]	FNC
12	Buffer 4 pH [off]	FNC
13	Buffer 5 pH [off]	FNC
14	Stir solution during measurement	X
15	Stir before meas.	IN
16	Pause before meas.	IN
17	Measuring input [1] [2]	C
18	Sensor	T
19	Temp. meas. [continuous] [automatic] [off]	C
20	Stirrer [1] [2] [3] [4] [off]	C
21	Stirring rate	IN

3.7.37 ## CAL Conc Concentration calibration

No.	Parameter description	Type
1	Titrando	T
2	Signal drift [off]	FNC
3	Waiting time min.	IN
4	Waiting time max. [off]	INC
5	Temperature	FN
6	Sample changer	X
7	Unit conc.	TC
8	Conc. standard 1	FN
9	Conc. standard 2 [off]	FNC
10	Conc. standard 3 [off]	FNC
11	Conc. standard 4 [off]	FNC
12	Conc. standard 5 [off]	FNC
13	Stir solution during measurement	X
14	Stir before meas.	IN
15	Pause before meas.	IN
16	Measuring input [1] [2]	C
17	Sensor	T
18	Temp. meas. [continuous] [automatic] [off]	C
19	Stirrer [1] [2] [3] [4] [off]	C
20	Stirring rate	IN

[1] A '+' in front of this value indicates more than one endpoint in a window.
[2] For direct measurements, the evaluations "Fix endpoint" and "Break point evaluation" may produce three report entries instead of four. In this case, the unused parameter Volume (FP1) is missing.
[3] Please note, that due to an error the title "$S Sensor# V1" is missing for uncalibrated sensors. Therefore, two many "$E" may appear.
[4] Calculation variables are written as pairs of shortname and value, each followed by a tabulator. Therefore, the final tabulator is not followed by a significant entry.
[5] not implemented; do not use entries.