BC 1060
USER 7500
SPECIFICATION

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1. Overview

This document describes the implementation of the 7500 protocol used in BC 1060 Carbon Monitor.

2. Communication Modes

2.1. Overview

There are three modes of communication:

1. *User communication* – This is a user interactive mode using simple letter commands for ease of use.
2. *Computer communication* – This mode is used for computer-to-device communication. It requires a level of data integrity.

2.2. User Communication

In the user communication mode (terminal mode), the user simply presses the Enter key, <cr>, three times to enter the mode. In this mode simple character commands can be issued with no <Esc> character required.

An asterisk character appears during wake-up, and also after a command has completed. The asterisk indicates that the instrument is ready for a new command. Commands are echoed back from the instrument in this mode. The characters must be echoed as received in the instrument.

A help menu can be viewed by sending H or h; giving all the commands available to the user.

Pressing <Esc> or Q<cr> will exit terminal mode.

2.3. Computer Communication

In the computer communication mode the command format requires a level of data integrity – checksum.

This mode is entered whenever an <Esc> character is sent to the instrument.

Character echo is suppressed in this mode.

2.3.1. Computer Command Format

The computer command has the following format:

```
<Esc>Cmd p1 p2*cs<cr>
```

Computer commands are prefaced with an `<Esc>` (0x1B) character followed directly by a command, `Cmd`, which is variable in length depending on the command. After the command characters there can be zero or more parameter fields, `p1 p2`. Each parameter field is delimited by one or more Space characters (0x20). The end of the message is signaled by the Checksum Delimiter character `*` (0x2A) followed by the checksum, `cs`, and finally terminated with a carriage return `<cr>` (0x0D) character.

A computer command example follows:

```
<Esc>RV*1234<cr>
```

All command responses are terminated with a checksum

```
RV 092, 99999-1, R9.9.9*1234<cr><lf>
```

2.3.2. Checksum Computation

Checksum is calculated as the 16 bit unsigned integer sum of all of the characters after the `<Esc>` character up to but not Including the Checksum Delimiter Character `*` (0x2A). It is printed out as an ASCII decimal number.

The result is always 5 characters in length with leading zeros.

The checksum may be bypassed in the following manner: `*//<cr>`.

3. Command Summary

3.1. Command List

$ – User level password protected commands

Command	Description
#	Get MetRecord revision.
1	Report settings.
2	Report All data.
3	Report New data.
4	Report Last data.
7	Report Alarm data.
C	Clear data file – $.
D	Get/Set date part of the real time clock – $.
H	Help menu.
K	Get/Set User K-Factor– $
T	Get/Set time part of the real time clock – $.
Q	Exit User mode
AC	Alarm Concentration – $
CA	Clear alarm log file – $
DE	Digital Sensor Enable – $
DS	Request Channel Descriptor Information – $.
DT	Get/Set the date and time of the real time clock – $.
ID	Get/Set location ID or address – $.
OI	Get/Set output interval.
OP	Get Operational status – $.
PR	Print report – 0-Settings, 1-Data, 2-Alarm
PW	Unlock user commands
QH	Report data record header.
RQ	Report last data record without header
RV	Get product information.
SB	Get/Set serial baud rate – $

SS	Get Met One serial number.
ST	Get/Set data logger sample rate – $
TS	Get/Set Time Stamp Mode – $
ASP	Get/Set Alarm Set Point – $
RRT	Report Remaining Tape
SPW	Get/Set user password – $
BXSP	Get/Set box heater set point – $
FLSP	Get/Set flow set point – $
FTSP	Get/Set flow heat set point – $
SPOT	Get/Set number of tape advance spots – $
TENA	Get/Set tape advance loading enable – $
TPER	Get/Set tape advance period – $
DFCTL	Dilution flow control mode – $
DFPCT	Dilution flow percentage – $
DSCRC	Get Channel Descriptor Table CRC – $
LOADK	Get/Set tape loading K factor – $
TLOAD	Get/Set tape advance loading – $
DFSPOT	Get/Set Dilution flow spot average count – $
DF80TH	Get/Set Dilution flow 80% threshold – $
DF50TH	Get/Set Dilution flow 50% threshold – $
XRDCRC	Get XMODEM file descriptors CRC – Refer to *File Record Descriptor Specification*
TCARBON	Get/Set tape advance load carbon type – $

4. User Commands

The command and responses shown below are for computer mode unless otherwise noted. User mode responses are more verbose and similar in nature.

4.1. # – Request MetRecord Revision

Command	Description
#	Request the MetRecord Revision.

Response	Description
# 7500 r	7500 – This document number r – The revision of this document implemented in firmware

Example
#<cr> # 7500 C<cr><lf>

4.2. 1 – Report Settings

Command	Description
1	Report the settings. The Factory Settings are encrypted. This report does not support the check sum if requested.

Response – User

```
BC 1060 Settings Report
2019-04-19 15:53:28

      Firmware, 82601, R1.3.0
          CPLD, 81699, R1.0.1
 Serial Number, X15465
      Location, 1
          Baud, 9600
 Sample Period, 1 MIN
    Time Stamp, ENDING
Tape Remaining, 69 %
    Load Level, 100
   Load Carbon, UVPM
    Alarm Conc, OFF
  Alarm Set Pt, 100.0
   Flow Set Pt, 2 LPM
 Dilution Ctrl, OFF
  Dilution Pct, 60
 50% Threshold, 7500
 80% Threshold, 15000
    N Spot Avg, 5
    Brightness, 128
      USB Days, 3
     USB Files, ALL
   UV K-Factor, 1.095
   BC K-Factor, 1.108
  UV K-Loading, 0.710
  BC K-Loading, 1.170
     FT Set Pt, 30.0
    Box Set Pt, 30.0
     UV Set Pt, 16.80
     BC Set Pt, 6.48
Digital Sensor, OFF

  Name, Offset,  Slope
  FLOW,  0.000,  0.957
 DFLOW,  0.000,  1.000
    AT,  0.000
    BP,  0.000
```

```
Factory Settings
DQogICAgICBQYXNzd29yZCwgMA0KICAgICAgIElTZXR0bGUsIDENCiAgICAgIElB
dmVyYWdlLCA5DQogICAgICBDLUZhY3RvciwgMi42MTANCiAgICAgICAgVVYgQWJz
LCAxOC4yMzM2DQogICAgICAgIEJDIEFicywgNy43NzAwDQogICBVViBLLUZhY3Rv
ciwgMS4wMDcNCiAgIEJDIEstRmFjdG9yLCAxLjAwNw0KICAgICBVViBBZXJvIEss
IDEuMDAwDQogICAgIEJDIEFlcm8gSywgMS4wMDANCiAgICBCb3ggUC1HYWluLCAx
MC4wMDANCiAgICBCb3ggSS1HYWluLCAwLjUwMA0KICAgICBGVCBQLUdhaW4sIDEw
LjAwMA0KICAgICBGVCBJLUdhaW4sIDAuNTAwDQogICBGbG93IFAtR2FpbiwgMTUw
MDANCiAgIEZsb3cgSS1HYWluLCA1MDAwDQogICAgIERGIFAtR2FpbiwgMTUwMDAN
CiAgICAgREYgSS1HYWluLCA1MDAwDQogICAgIFNhdCBMaW1pdCwgMjQ1MA0KICAg
ICBEZXQgTGltaXQsIDEwMA0KICAgIFplcm8gTGltaXQsIDUNCiAgIERyb29wIExp
bWl0LCAwLjEwMA0KICAgVGFwZSBQZXJpb2QsIDEgSFINCiAgICAgVGFwZSBTcG90
LCAxDQogICBMb2FkIEVuYWJsZSwgT04NCk==
```

4.3. 2 – Report All Data

Command	Description
2	Report all the data.

Header Response: A report header is present for the CSV format when execute from terminal mode. It is suppressed in computer mode. This report does not support the check sum if requested.
Data Report 2019-04-19 15:56:22 Location, 1, X15465 Time,UVPM(ng/m3),BC(ng/m3),BIO(ng/m3),Flow(lpm),DFlow(lpm), WS(m/s),WD(Deg),AT(C),RH(%),BP(mbar),Status

Data Response
2019-04-16 06:47:00,+000410.9,+000162.6,+000248.4,+2.0, +00.0,+000.0,000000,+013.9,000000,0973.3,000000

Note: an <Esc> or <cr> character will cancel a report.

4.4. 3 – Report New Data

Command	Description
`3`	Report the new data since the last request.

Response:
The response is the same as the 2-command.

4.5. 4 – Report Last Data

Command	Description
`4`	Report the last data record.
`4 0`	Report all the data.
`4 -1`	Report the new data since the last request.
`4 n`	Report the last `n` records where `n` is less than or equal to 2000.
`4 ts`	Request the last data since timestamp, where `ts` has the format `yyyy-MM-dd HH:mm:ss`.

Response:
The response is the same as the 2-command.

4.6. 7 – Report Alarm Data

Command	Description
`7`	Report all the data.
`7 -1`	Report the new data since the last request.
`7 n`	Report the last `n` hours where `n` is less than or equal to 2000.
`7 ts`	Request the last data since timestamp, where `ts` has the format `yyyy-MM-dd HH:mm:ss`.

Header Response: A report header is present for the `CSV` format when execute from terminal mode. It is suppressed in computer mode. If the check sum is requested the check sum value will be prefaced with a comma only on the data header line.

```
Alarm Report
2015-09-24 13:42:41
Location, 1, I12345

Time,Alarm
```

Response: If the check sum is requested the check sum value will be prefaced with a comma.

```
2019-04-16 06:47:39,MAINTENANCE
2019-04-18 08:40:44,POWER OUTAGE
```

4.7. C – Clear Data Log

Command	Description
`C Y`	Clear the data log.

Response

```
C Y
```

Example

```
C Y<cr>
C Y<cr><lf>
```

4.8. D – Request or Set the Date Only

Command	Description
D	Request the date part of the real time clock.
D yyyy-MM-dd	Set the date part of the real time clock.

Response
D yyyy-MM-dd

Parameter	Description
yyyy	Years 2000 – 2037 (must be 4 digits)
MM	Months 1 – 12 (must be 2 digits, use leading zeros)
dd	Days 1 – 31 (must be 2 digits use leading zeros)

Example
D<cr> D 2013-01-08<cr><lf> D 2013-01-08<cr> D 2013-01-08<cr><lf>

4.9. H – Help Menu

Command	Description
H	Report the help menu. The Factory Menu is included if Factory password has been issued.

```
BC 1060 Help Menu

 1 - Report Settings
```

```
 2 - Report All Data
 3 - Report New Data
 4 - Report Last Data
 7 - Report Alarm Data
 C - Clear Data File
 K - Set User K-Factor
AC - Set User Alarm Channel
CA - Clear Alarm File
DS - Report Data Log Channel Descriptors
DT - Set Date/Time
ID - Set Location ID
OI - Set Output Interval
OP - Set Operation State
PR - Print Report
QH - Report Data Record Header
RQ - Request Last Data Record
RV - Report Model/Part/Revision
SB - Set Baud Rate
SS - Report Serial Number
ST - Set Data Log Period
TS - Set Timestamp Mode
ASP - Set User Alarm Set Point
```

4.10. K – Request or Set the K-Factor

Command	Description
`K n`	Request K-factor setting for BC channel n (1-UVPM, 2-BC).
`K n x.xxx`	Set K-factor setting for BC channel n (1 – 1) where x.xxx is the value and the range is 0.1 to 9.999.

Response	Description
`K 1-UVPM 1.000`	Returns the channel 1 K-factor.

Example
`K 1<cr>` `K 1-UVPM 1.000<cr><lf>`

```
K 2 1.5<cr>
K 2-BC 1.500<cr><lf>
```

4.11. T – Request or Set the Time Only

Command	Description
T	Request the time part of the real time clock.
T HH:mm:ss	Set the time part of the real time clock.

Response	Description
T HH:mm:ss	HH – Hours 0 – 23. mm – Minutes 0 – 59. ss – Seconds 0 – 59, this parameter is optional. When omitted the value will be 0.

Example
T<cr> T 13:18:38<cr><lf> T 14:13:12<cr> T 14:13:12<cr><lf>

4.12. Q – Exit User Mode

Command	Description
Q	Exit User mode and enter Computer mode. Esc will also exit User mode.

Response	Description
Exit User Mode	The command was successful.

Example
Q<cr> Exit User Mode<cr><lf>

4.13. AC – Clear Alarm Log

Command	Description
AC	Request Concentration Alarm channel.
AC e	Set the channel used for the concentration alarm. The range is 0-OFF, 1-UVPM, 2-BC

Response	Description
AC e-chan	Where e is the enumerator and chan is the channel used to generate the alarm.

Example
AC<cr> AC 0-OFF<cr><lf> AC 1<cr> AC 1-UVPM<cr><lf> AC ?<cr> AC 0-OFF,1-UVPM,2-BC<cr><lf>

4.14. CA – Clear Alarm Log

Command	Description
CA Y	Clear the alarm log.

Response
CA Y

Example
CA Y<cr> CA Y<cr><lf>

4.15. DE – Digital sensor Enable

Command	Description
`DE`	Request Digital Sensor Enabled status.
`DE e`	Set the Digital Sensor Enable status. 0-OFF, 1-ON

Response	Description
`DE e-stat`	Where `e` is the enumerator and `stat` is the Digital Sensor Enabled status.

Example

`DE<cr>`
`DE 0-OFF<cr><lf>`
 	
`DE 1<cr>`
`DE 1-ON<cr><lf>`
 	
`DE ?<cr>`
`DE 0-OFF,1-ON<cr><lf>`

4.16. Channel Descriptor Table Commands

Channel descriptor commands are used to query the instrument for measurement channel descriptor information. These commands can be accessed by any serial device such as a data logger or software.

Information can be retrieved in either in single line responses or in bulk. Single line responses are needed for devices with limited serial input buffer sizes.

4.17. DS 0 – Get Channel Descriptor Table Information

Command	Description
`DS 0`	This command returns the general table information.

Response	Description
`DS n,id,r`	The response will indicate the general descriptor information.

	n – Number of channel/field descriptor lines available. id – Location ID r – Reserved for future use. 0 is the default.

Example
DS 0<cr> DS 12,1,0<cr><lf>

4.18. DS c – Channel Descriptor Information

Command	Description
DS c	This command returns the specific channel descriptor information. c – Channel number.

Response
DS c,FieldName,MeasureType,units,prec,math,max,min

Parameter	Description
c	Field number – 1 based.
FieldName	Field name string in printable ASCII. This is the user selected name for the measurement. Example: AT1 for air temp, FT1 for flow temp, etc.
MeasureType	Measurement type string in printable ASCII See the definitions in Appendix B
units	Engineering units string in printable ASCII. See the definitions in Appendix C.
prec	Display value precision.
math	Math type field. Vector (V), Scalar (S), Total (T), Minimum (MIN), Maximum (MAX), Standard Deviation (STD), No math type (NONE), Binary OR (OR).
max	Maximum measurement value.
min	Minimum measurement value.

Example
DS 2<cr> DS 2,UVPM,CONC,ng/m3,1,S,1000000.0,-10000.0<cr><lf>

4.19. DS – Request All Channel Descriptor Information

Command	Description
DS	This command returns all of the Channel Descriptor information. The command can be used for devices that have a large serial input buffer size.

Example
DS<cr> DS 1,Time,TIME,,0,NO,0,0 DS 2,UVPM,CONC,ng/m3,1,S,1000000.0,-10000.0 DS 3,BC,CONC,ng/m3,1,S,1000000.0,-10000.0 DS 4,BIO,CONC,ng/m3,1,S,1000000.0,-10000.0 DS 5,Flow,FLOW,lpm,1,S,10.0,0.0 DS 6,DFlow,FLOW,lpm,1,S,10.0,0.0 DS 7,WS,WS,m/s,1,S,50.0,0.0 DS 8,WD,WD,Deg,0,V,180,0 DS 9,AT,AT,C,1,S,70.0,-50.0 DS 10,RH,RH,%,1,S,100.0,0.0 DS 11,BP,BP,mbar,1,S,1100.0,500.0 DS 12,Status,INFO,,0,OR,0,0

4.20. DSCRC – Channel Descriptor table CRC

Command	Description
DSCRC	This command returns the channel descriptor table CRC. The intent is for the system or software to query and save this CRC. The value is then compared on subsequent reads to check for any instrument configuration changes. If the CRC does not match the previous CRC then check for a change in the field configuration parameters.

Response	Description
DSCRC hhhh	hhhh – The CRC value in hexadecimal.

Example
DSCRC<cr> DSCRC 52B2<cr><lf>

DT – Request or Set the Date and Time

Command	Description
DT	Request the date and time part of the real time clock.
DT yyyyMMddHHmmss DT yyyy-MM-dd HH:mm:ss	Set the date and time part of the real time clock.

Response
DT yyyy-MM-dd HH:mm:ss

Parameter	Description
yyyy	Years 2000 – 2037 (must be 4 digits)
MM	Months 1 – 12 (must be 2 digits if included)
dd	Days 1 – 31 (must be 2 digits if included)
HH	Hours 0 – 23 (must be 2 digits if included)
mm	Minutes 0 – 59 (must be 2 digits if included)
ss	Seconds 0 – 59 (must be 2 digits if included)

Example

```
DT<cr>
DT 2013-01-08 11:39:23<cr><lf>

DT 2013<cr>
DT 2013-01-01 00:00:00<cr><lf>

DT 20130108<cr>
DT 2013-08-08 00:00:00<cr><lf>

DT 2013-01-081141<cr>
DT 2013-01-08 11:41:00<cr><lf>
```

4.21. ID – Request or Set the Location ID

Command	Description
`ID`	Request the Location ID.
`ID id`	Set the Location ID. The range is 1 to 999.

Response	Description
`ID id`	`id` – The location ID. The ID value is three characters with leading zero's.

Example

`ID<cr>`
`ID 001<cr><lf>`
 	
`ID 2<cr>`
`ID 002<cr><lf>`

4.22. OI – Request Output Interval

Command	Description
`OI`	Request the output interval.

Response	Description
`OI 0`	Always zero. Included for 466A compatibility

Example

`OI<cr>`
`OI 0<cr><lf>`
 	
`OI 1<cr>`
`OI 0<cr><lf>`

4.23. OP – Request or Set Operation Status

Command	Description
`OP`	Request the operational status.
`OP n`	Set the operation state where `n` is `0=stop operation, 1=start operation`

Response	Description

`OP e-state`	Where `e` is the enumerator and `state` is the name of the operation state.
	`0-STOPPED`
	`1-STARTING`
	`2-STOPPING`
	`3-MOVING TAPE`
	`4-WAIT CLOSED`
	`5-WAIT OPEN`
	`6-WAIT FLOW`
	`7-WAIT TOP-OF-MIN`
	`8-WAIT I0`
	`9-WAIT IX`

Example

`OP<cr>`
`OP 0-OFF<cr><lf>`
 	
`OP<cr>`
`OP 1-STARTING<cr><lf>`
 	
`OP 1<cr>`
`OP 0-STOPPED`

4.24. PR – Print Report

Command	Description
`PR f`	Print report where f is the file number. 0 – Settings 1 – Data 2 – Alarm
`PR f 0`	Report all the data.
`PR f -1`	Report the new data since the last request.
`PR f n`	Report the last `n` hours where `n` is less than or equal to 2000.
`PR f ts`	Request the last data since timestamp, where `ts` has the format `yyyy-MM-dd HH:mm:ss`.

4.25. PW – Unlock Commands

Command	Description
`PW x`	This command unlocks the protected commands where `x` is the password setting.
`PW`	This command locks the protected commands. There is no response for this command.

Response	Description
`PW Unlocked`	The protected commands are unlocked.

Example
`PW 1000<cr>` `PW Unlocked<cr><lf>`

4.26. QH – Report Data Record Header

Command	Description
QH	Report data record header.

Response:

```
Time,UVPM(ng/m3),BC(ng/m3),BIO(ng/m3),Flow(lpm),DFlow(lpm),
WS(m/s),WD(Deg),AT(C),RH(%),BP(mbar),Status
```

If the check sum is requested the check sum value will be prefaced with comma.

```
…,AT(C),RH(%),BP(mbar),Status,*07701
```

Example

```
QH<cr>
Time,UVPM(ng/m3),BC(ng/m3),BIO(ng/m3),Flow(lpm),DFlow(lpm),
WS(m/s),WD(Deg),AT(C),RH(%),BP(mbar),Status <cr><lf>
```

4.27. RQ – Report Last Data Record

Command	Description
RQ	Report last data record without header.

Response:

```
2019-04-19
16:21:00,+000110.4,+000071.4,+000039.0,+2.0,+00.0,+000.0,000000,
+024.1,000000,0968.5,000000
```

If the check sum is requested the check sum value will be prefaced with comma.

```
-0.8,1707.764,1838.878,0.00301,2.2,5.00,0.0,0,24.63,31.6,
977.02,30.58,30.64,30.12,0,*03789
```

Example

```
RQ<cr>
2019-04-19
16:21:00,+000110.4,+000071.4,+000039.0,+2.0,+00.0,+000.0,000000
,+024.1,000000,0968.5,000000,*04065<cr><lf>
```

4.28. RV – Report Model, Firmware, Revision

Command	Description
RV	Request the model number, firmware part number, and revision string. Instruments with more than one processor or programmable devices will include more than one part number and revision on the next subsequent lines.

Response	Description
m, p, r	m – Device model name. p – Firmware part number. r – Firmware revision.

Example
RV<cr> BC 1060, 82601, R1.3.0 <cr><lf> CPLD, 81699, R1.0.1 <cr><lf>

4.28.1. RV 0 – Request the number of processor/devices supported

Command	Description
RV 0	Request the number of processor or programmable devices.

Response	Description
RV n	n – Number processor or programmable devices.

Example
RV 0<cr> RV 2<cr><lf>

4.28.2. RV n – Request individual processor/device information

Command	Description
`RV n`	Request the model number, firmware part number, and revision for a specified processor or programmable device `n`.

Response	Description
`RV e m, p, r`	`e` – Device enumerator. `m` – Device model name. `p` – Firmware part number. `r` – Firmware revision.

Example

`RV 1<cr>`
`RV 1 BC 1060, 82601, R1.3.0 <cr><lf>`
 	
`RV 2<cr>`
`RV 1 BC 1060, 82601, R1.3.0 <cr><lf>`

4.29. SB – Request or Set the Serial Baud Rate

Command	Description
SB	Request or set the serial baud rate setting. The new baud rate will be set immediately.
SB m	Set the serial baud rate where m is 2-1200, 3-2400, 4-4800, 5-9600, 6-19200, 7-38400, 8-38400, 9-115200.

Response	Description
SB m-name	m – Serial baud rate enumerator. name – enumerator name.

Example
SB<cr> SB 5-9600<cr><lf> SB 9<cr> SS 9-115200<cr><lf>

4.30. SS – Request the Serial Number

Command	Description
SS	Request the serial number.
SS A99999	Set the serial number. Factory unlock required. A99999 – Follows the MOI standard definition.

Response	Description
SS A99999	

Example
SS<cr> SS T21312<cr><lf>

4.31. ST – Request or Set the Sample Time

Command	Description
ST	Request the Sample Time.
ST e	Set the Sample Time. e – the Sample Time, where e is 0-1 MIN,1-5 MIN,2-10 MIN, 3-15 MIN,4-30 MIN,5-1 HR

Response	Description
ST e-v	e – The enumerator value. v – The current sample time value.

Example
ST<cr> ST 5-1 HR<cr><lf> ST 1<cr> ST 1-5 Min<cr><lf>

4.32. TS – Request or Set the Time Stamp Mode

Command	Description
TS	Request the Time Stamp Mode.
TS e	Set the Time Stamp Mode. e – the mode, where e is 0-ENDING,1-BEGINNING

Response	Description
TS e-v	e – The enumerator value. v – The current time stamp mode.

Example
TS<cr> TS 0-ENDING<cr><lf>

```
TS 1<cr>
TS 1-BEGINNING<cr><lf>
```

4.33. ASP – Alarm Set Point

Command	Description
ASP	Request the Alarm Set Point.
ASP p	Set the Alarm Set Point. The p Set Point is 0 to 1000. This is in ug/m3 regardless of the units setting.

Response	Description
SPW 100.0	

Example
ASP<cr> ASP 100.0<cr><lf> ASP 150<cr> ASP 150.0<cr><lf>

4.34. RRT – Request Remaining Tape

Command	Description
RRT	Request the Remaining Tape percentage.

Response	Description
RRT 63%	

Example
RRT<cr> RRT 63%<cr><lf>

4.35. SPW – Request or Set User Password

Command	Description
SPW	Request the user password setting.
SPW p	Set the user password setting. The p range is 0 to 9999. A 0 is no password required.

Response	Description
SPW 1000	

Example
SPW<cr> SPW 1000<cr><lf> SPW 0<cr> SPW 0000<cr><lf>

4.36. BXSP – Request or Set the Box Temperature Set Point

Command	Description
BXSP	Request box temperature set point setting.
BXSP sp	Set the box temperature set point setting. The sp parameter range is 0.0 – 40.0 C.

Response	Description
BXSP 30.0	Return the current box temperature set point.

Example
BXSP<cr> BXSP 25.0<cr><lf>

BXSP 40.0<cr> BXSP 40.0<cr><lf>

4.37. FLSP – Request or Set the Flow Rate Set Point

Command	Description
FLSP	Request flow rate set point setting.
FLSP e	Set the flow rate set point setting. (currently there is only 1 choice) The e enumerator is 0-2 LPM.

Response	Description
FLSP 1-5 LPM	Return the current flow rate set point enumerator.

Example
FLSP<cr> FLSP 0-2 LPM<cr><lf> FLSP 0<cr> FLSP 0-2 LPM<cr><lf>

4.38. FTSP – Request or Set the Flow Temperature Set Point

Command	Description
FTSP	Request flow temperature set point setting.
FTSP sp	Set the flow temperature set point setting. The sp parameter range is 25.0 – 40.0 C.

Response	Description
FTSP 30.0	Return the current flow temperature set point.

Example
FTSP<cr>

FTSP 25.0<cr><lf> FTSP 30.0<cr> FTSP 30.0<cr><lf>

4.39. SPOT – Request or Set the Tape Advance Spots

Command	Description
SPOT	Request tape advance spot setting.
SPOT n	Set the tape advance spot setting. The n range is 1 to 2.

Response	Description
SPOT 1	

4.40. TENA – Request or Set the Tape Loading Enable

Command	Description
TENA	Request tape loading enable setting.
TENA e	Set the tape loading enable setting. The BC-1060 is always enabled The e range is 1-ON.

Response	Description
TENA 1-ON	

Example
TENA<cr> TENA 1-ON<cr><lf> TENA 0<cr> TENA 1-ON <cr><lf>

4.41. TPER – Request or Set the Tape Advance Period

Command	Description
TPER	Request tape advance period setting.
TPER e	Set the tape advance period setting. The e range is 0-AUTO, 1-1 HR.

Response	Description
TPER 0-AUTO	

Example
TPER<cr> TPER 1-1 HR<cr><lf> TPER 0<cr> TPER 0-AUTO<cr><lf>

4.42. DFCTL – Request or Set the Dilution Flow Control

Command	Description
DFCTL	Request Dilution flow control.
DFCTL x	Set the Dilution flow control. The x range is 0-OFF, 1-FIXED, 2-AUTO.

Response	Description
DFCTL x	The x indicates Dilution flow setting

Example
DFCTL<cr> DFCTL 0-OFF<cr><lf> DFCTL 2<cr> DFCTL 2-AUTO<cr><lf>

4.43. DFPCT – Request or Set the Dilution Flow percentage

Command	Description
DFPCT	Request Dilution flow percentage.
DFPCT x	Set the Dilution flow percentage. The x range is 5-50, 6-60, 7-70, 8-80.

Response	Description
DFPCT x	The x indicates Dilution flow percentage

Example
DFPCT<cr> DFPCT 5-50<cr><lf> DFPCT 8<cr> DFPCT 8-80<cr><lf>

4.44. DFSPOT – Request or Set the Dilution Flow average spot count

Command	Description
DFSPOT	Request Dilution flow average spot count.
DFSPOT x	Set the Dilution flow average spot count. The x range is 1 to 9.

Response	Description
DFSPOT x	The x indicates Dilution flow percentage

Example
DFSPOT<cr> DFSPOT 5-50<cr><lf> DFSPOT 8<cr> DFSPOT 8<cr><lf>

4.45. DF50TH – Request or Set the Dilution Flow 50% threshold

Command	Description
DF50TH	Request Dilution flow 50% threshold for Automatic dilution control.
DF50TH x	Set the Dilution flow 50% threshold. The x range is 1000 to 99999 ng.

Response	Description
DF50TH x	The x indicates Dilution flow 50% threshold

Example
DF50TH<cr> DF50TH 7500<cr><lf> DF50TH 9000<cr> DF50TH 9000<cr><lf>

4.46. DF80TH – Request or Set the Dilution Flow 80% threshold

Command	Description
DF80TH	Request Dilution flow 80% threshold for Automatic dilution control.
DF80TH x	Set the Dilution flow 80% threshold. The x range is 1000 to 99999 ng.

Response	Description
DF80TH x	The x indicates Dilution flow 80% threshold

Example
DF80TH<cr> DF80TH 15000<cr><lf> DF80TH 30000<cr> DF80TH 30000<cr><lf>

4.47. LOADK – Request or Set the Tape Loading K-Factor

Command	Description
`LOADK n`	Request Load K-factor setting for channel n (1-UVPM, 2-BC).
`LOADK n x.xxx`	Set Load K-factor setting for BC channel n (1-2) where x.xxx is the value and the range is 0.1 to 9.999.

Response	Description
`LOADK 1-UVPM 1.000`	Returns the channel 1 Load K-factor.

Example

`LOADK 1<cr>`
`LOADK 1-UVPM 1.000<cr><lf>`
 	
`LOADK 2 1.2<cr>`
`LOADK 2-BC 1.200<cr><lf>`

4.48. TLOAD – Request or Set the Tape Advance Loading

Command	Description
`TLOAD`	Request tape advance loading.
`TLOAD x`	Set the tape advance loading in percent. The `x` range is 10 to 125.

Response	Description
`TLOAD x`	The `x` range is 10 to 125.

Example

`TLOAD<cr>`
`TLOAD 30<cr><lf>`
 	
`TLOAD 100<cr>`
`TLOAD 100<cr><lf>`

4.49. XRDCRC – Request the XMODEM File Descriptor CRC

Command	Description
`XRDCRC f`	Request the file descriptor CRC, where f is the file number. 1 – Data

Response	Description
`XRDCRC f hhhh`	`f` – the file number (1 – Data) `hhhh` – the file record descriptor CRC value in hexadecimal.

Example
`XRDCRC 1<cr>` `XRDCRC 1 7923<cr><lf>`

4.50. TCARBON – Request or Set the Load Carbon Type

Command	Description
`TCARBON`	Request tape loading carbon type.
`TCARBON e`	Set the tape loading carbon type setting. The `e` range is 0-UVPM, 1-BC.

Response	Description
`TCARBON 1-BC`	

Example

`TCARBON <cr>`
`TCARBON 0-UVPM<cr><lf>`
 	
`TCARBON 1<cr>`
`TCARBON 0-BC<cr><lf>`