

BAM 1020 GENERATION 2 COMMAND SPECIFICATION



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Table of Contents

- 1. Overview 4**
- 2. Generation 2 Commands 4**
 - 2.1. Overview 4
- 3. Terminal Mode 4**
- 4. Command Summary 5**
 - 4.1. Single Character Command List..... 5
 - 4.2. CSV Report Command List 5
 - 4.3. <Esc> Command List 6
- 5. Single Character Commands 7**
 - 5.1. 4 – Print the Settings Report 7
 - 5.2. 5 – Print the Current Data and Time 9
 - 5.3. 6 – Print the CSV Report Menu 9
 - 5.3.1. CSV 2 – Print All the Data File Records 10
 - 5.3.2. CSV 3 – Print the New Data File Records 10
 - 5.3.3. CSV 4 – Print the Last Data File Record 11
 - 5.3.4. CSV 5 – Print All the Flow Stats File Records 11
 - 5.3.5. CSV 6 – Print the New Flow Stats File Records 11
 - 5.3.6. CSV 7 – Print All the 5-Min Flow File Records 12
 - 5.3.7. CSV 8 – Print the New 5-Min Flow File Records 12
 - 5.3.8. CSV 9 – Print the Error Report 13
 - 5.4. 7 – Print the Error Report 14
 - 5.5. 8 – Print the Utility Menu 15
 - 5.6. 9 – Print the Data File Pointers..... 16
 - 5.7. b – Xmodem Data File Download..... 17
 - 5.8. c – Clear the Data Memory..... 17
 - 5.9. d – Set the Date..... 18
 - 5.10. h – Print the System menu 18
 - 5.11. p – Set the Data File Pointer 19
 - 5.12. t – Set the Time 19
- 6. <Esc> Commands 20**
 - 6.1. <Esc>3 – Set New Data File Pointer 20
 - 6.2. <Esc>6 – Set New Flow State File Pointer 20
 - 6.3. <Esc>8 – Set New 5-Min Flow File Pointer 21
 - 6.4. <Esc>DT – Get or Set Date and Time 22
 - 6.5. <Esc>MN – Get or Set the Maintenance 'M' Flag 23

6.6.	<Esc>PT – Get or Set Protocol Type	24
6.7.	<Esc>RV – Print Model, Firmware, Revision	25
6.8.	<Esc>SS – Get the Serial Number.....	26

1. Overview

This document describes the implementation of the Generation 2 command subset included as part of the STANDARD 7500 protocol used in the BAM 1020.

2. Generation 2 Commands

2.1. Overview

The subset of Generation 2 commands is included for backwards compatibility. You are encouraged to migrate over to the rich set of command provide with the 7500 protocol where possible.

The PT command is used to switch between Generation 2 commands and the standard 7500 protocol commands. See the command description below.

3. Terminal Mode

Single character commands are available only in terminal mode.

Enter terminal mode by sending the three (3) consecutive carriage return (ASCII CR) characters. The time delay between carriage return characters can be no longer that 3-seconds.

An asterisk (*) character appears when terminal mode has been entered, 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.

Sending the <Esc> character will exit terminal mode.

5-minutes of inactivity will also exit terminal mode.

4. Command Summary

4.1. Single Character Command List

Command	Description
4	Print the Setting report
5	Print the Current Date and Time
6	Print the CSV report menu
7	Print the Error report
8	Print the Utility menu
9	Print the Data file pointers
b	Xmodem Data file download
c	Clear the data memory
d	Set the Date
h, H, ?	Print the System menu
p	Set the Data file pointer
t	Set the Time

4.2. CSV Report Command List

These commands execute from the CSV report menu.

Command	Description
2	Print all the Data file records
3	Print the new Data file records
4	Print the newest/last Data file record
5	Print all the Flow Stats file records
6	Print the new Flow Stats file records
7	Print all the 5-Min Flow file records
8	Print the new 5-Min Flow file records
9	Print the Error report

4.3. <Esc> Command List

These commands execute following a carriage return character (ASCII CR).

Command	Description
3	Set the new Data file pointer
6	Set the new Flow Stats file pointer
8	Set the new 5-Min Flow file pointer
DT	Get/Set the Date and Time
MN	Get/Set the Maintenance 'M' flag/bit
PT	Get/Set protocol type
RV	Print the Model, firmware Part number, and firmware Revision
SS	Get the serial number

5. Single Character Commands

These commands are available in terminal mode.

A single character command executes immediately upon receipt.

5.1. 4 – Print the Settings Report

Command	Description
4	Print the Settings report.

Response
<pre>BAM 1020 Settings Report 2020-06-12 16:27:07 Station ID, 1 Serial Number, A14540 Firmware, 83347, R9.0.0 Display, 82451, R1.1 Digital 1, 597, 10503-01, R01.0.0 K, 1.000 Background, 0.0000 Us, 0.302 Span Membrane, 0.851 Conc Units, ug/m3 Beta Count, 4-MINUTE Conc Error, FULL SCALE VALUE Inlet Type, PM10 Span Check, 24 HR Factory Mode, OFF Standard Temp, 25 C Tape Pressure, 150 Pres Units, mmHg FRH Set Point, 35 Low Power, 20 BAM Sample, 50 MET Average, 1 HR Cycle Mode, STANDARD Maintenance, OFF Time Stamp, ENDING Interval Output, 0 Conc Range, 1000 ug/m3 Conc Offset, -15 ug/m3 Analog Range 1, 0-1.0 V Analog Range 2, 0-1.0 V DAC Cal 1, 0.0,0,1.0,29789 DAC Cal 2, 0.0,0,1.0,29789 RS-232, 115200 Flow Control-232, NONE RS-485, 115200 Modbus Port, RS-232 Modbus Address, 1 Byte Order, 512</pre>

IP Config, Static, DHCP
 IP Address, 0.0.0.0, 0.0.0.0:7500
 Subnet Mask, 0.0.0.0, 0.0.0.0
 Gateway, 0.0.0.0, 0.0.0.0

Report Type, GENERATION 2
 Conc Type, ACTUAL
 Conc Range, 1000 ug/m3
 Conc Offset, -15 ug/m3
 Dynamic Range, STANDARD
 BP Log, NONE
 Memb Log, NONE
 RH Log, NONE
 FRH Log, NONE
 FT Log, NONE

Flow Zero, 0.03

Name, Offset, Slope
 Flow, 0.000, 1.000
 AT, 0.000
 BP, 69.269
 FT, 0.000
 FRH, 0.000
 FP, -30.754

Sound Volume, 10
 Language, English

Channel,	1,	2,	3,	4,	5,	6,	7,	8,
Name,	Conc,	Qtot,	XXXXX,	XXXXX,	XXXXX,	XXXXX,	XXXXX,	AT,
Units,	ug/m3,	m3,	XXX,	XXX,	XXX,	XXX,	XXX,	C,
Prec,	0,	3,	0,	0,	0,	0,	0,	1,
FS Volts,	2.500,	2.500,	1.000,	1.000,	1.000,	1.000,	1.000,	2.500,
Mult,	1000,	3.000,	1,	1,	1,	1,	1,	120.0,
Offset,	-15.0,	0.000,	0,	0,	0,	0,	0,	-50.0,
Vect/Scalar,	S,	S,	S,	S,	S,	S,	S,	S,
Inv Slope,	N,	N,	N,	N,	N,	N,	N,	N,

5.2. 5 – Print the Current Data and Time

Command	Description
5	Print the Current Data and Time

Response
* 5 06/12/2020 16:29:42 X1198 *

5.3. 6 – Print the CSV Report Menu

Command	Description
6	Print the CSV report menu. The > character prompt indicates only the commands in the CSV menu are available. A carriage return will exit the menu.

Response
* 6 CSV Type Reports 2 - Display All Data 3 - Display New Data 4 - Display Last Data 5 - Display All Flow Stats 6 - Display New Flow Stats 7 - Display All 5-Min Flow 8 - Display New 5-Min Flow 9 - Display Error Log >

5.3.3. CSV 4 – Print the Last Data File Record

Command	Description
4	Print the last Data file record.

Response
Same as CSV 2 response.

5.3.4. CSV 5 – Print All the Flow Stats File Records

Command	Description
5	Print All the Flow Stats file records.

Response
> 5 Flow Statistics Report 06-15-20 15:45:55, 1 Time,Elapsed(HH:mm:ss),Flow(lpm),CV(%),Vol(m3),Flag,AT(C),AT Min,AT Max,BP(mmHg),BP Min,BP Max 06-12-20 17:08:38,00:41:58,16.67,0.3,0.699,0,24.1,24.0,24.3,730.4,730.3,730.6

5.3.5. CSV 6 – Print the New Flow Stats File Records

Command	Description
6	Print the new Flow Stats file records since the last command. Use the <Esc>6 command to set the new file pointer

Response
Same as CSV 5 response.

5.3.6. CSV 7 – Print All the 5-Min Flow File Records

Command	Description
7	Print All the 5-Min Flow file records.

Response
> 7 5-Minute Flow Report 06-15-20 15:47:43, 1 Time, Flow (lpm) , AT (C) , BP (mmHg) , FP (mmHg) 06-12-20 17:13:41, 16.71, 24.0, 730.4, 552.5

5.3.7. CSV 8 – Print the New 5-Min Flow File Records

Command	Description
8	Print the new 5-Min Flow file records since the last command. Use the <Esc>8 command to set the new file pointer.

Response
Same as CSV 7 response.

5.3.8. CSV 9 – Print the Error Report

Command	Description
9	Print the Error report.

Response
The response is the same as command 7 below.

5.4. 7 – Print the Error Report

Command	Description
7	Print the Error report.

Response
<pre> * 7 06/12/20 16:40:30, Tape 06/12/20 16:40:30, Tape,Latch 06/12/20 16:40:30, Tape,Shuttle Reset 06/12/20 16:40:30, Tape,Shuttle Fine 06/12/20 16:40:30, Tape,Forward Move 06/12/20 16:40:30, Tape,Forward Timeout 06/12/20 16:40:30, Tape,Backward Move 06/12/20 16:40:30, Tape,Backward Timeout 06/12/20 16:40:30, Tape,Tension 06/12/20 16:40:30, Tape,Un-Tension 06/12/20 16:40:30, Tape,Capstan Forward Move 06/12/20 16:40:30, Tape,Capstan Forward Timeout 06/12/20 16:40:30, Tape,Capstan Backward Move 06/12/20 16:40:30, Tape,Capstan Backward Timeout 06/12/20 16:40:30, Tape,Capstan Fine Backward Move 06/12/20 16:40:30, Tape,Capstan Fine Forward Timeout 06/12/20 16:40:30, Tape,Tape Break 06/12/20 16:40:30, Tape,Fail Safe 06/12/20 16:40:30, Tape,Unknown Subcategory 06/12/20 16:40:30, Count 06/12/20 16:40:30, Count,Mass 06/12/20 16:40:30, Count,Membrane 06/12/20 16:40:30, Count,Stability 06/12/20 16:40:30, Count,Unknown Subcategory 06/12/20 16:40:30, Membrane Deviation 06/12/20 16:40:30, Membrane Deviation,5% 06/12/20 16:40:30, Membrane Deviation,Unknown Subcategory 06/12/20 16:40:30, Pressure 06/12/20 16:40:30, Pressure,Filter Pressure 06/12/20 16:40:30, Pressure,Unknown Subcategory 06/12/20 16:40:30, Flow 06/12/20 16:40:30, Flow,QTotal 06/12/20 16:40:30, Flow,5% Out-of-regulation 06/12/20 16:40:30, Flow,Flow Failure 06/12/20 16:40:30, Flow,AT Failure 06/12/20 16:40:30, Flow,AT Disconnected 06/12/20 16:40:30, Flow,Internal FP Failure 06/12/20 16:40:30, Flow,Internal RH Failure 06/12/20 16:40:30, Flow,External BP Failure 06/12/20 16:40:30, Flow,Pump Off Failure 06/12/20 16:40:30, Flow,Unknown Subcategory 06/12/20 16:40:30, Nozzle 06/12/20 16:40:30, Nozzle,Up 06/12/20 16:40:30, Nozzle,Down </pre>

```

06/12/20 16:40:30, Nozzle,Unknown Subcategory
06/12/20 16:40:30, Membrane Timeout
06/12/20 16:40:30, Membrane Timeout,Withdraw
06/12/20 16:40:30, Membrane Timeout,Extend
06/12/20 16:40:30, Membrane Timeout,Unknown Subcategory
06/12/20 16:40:30, Power Fail
06/12/20 16:40:30, Internal
06/12/20 16:40:30, Internal,Mass
06/12/20 16:40:30, Internal,Membrane
06/12/20 16:40:30, Internal,Stability
06/12/20 16:40:30, Internal,Coarse
06/12/20 16:40:30, Internal,Unknown Subcategory
06/12/20 16:40:30, Maintenance

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5.5. 8 – Print the Utility Menu

Command	Description
8	Print the Utility menu.

Response
<pre> * 8 > BAM 1020 < Utility Commands ASCII Commands: c - Clear Data Memory (Password required) d - Set Date (Password required) h,H,? - Display > BAM 1020 < System Menu p - Modify Modem Pointer t - Set Time (Password required) BINARY Commands: b - XMODEM Download of Data * </pre>

5.6. 9 – Print the Data File Pointers

Command	Description
9	<p>Print the Data file pointers.</p> <p>The data file is a cyclic memory device with data records stored in sequence. When the memory device is full the oldest data is overwritten.</p> <p>The data logger uses four pointers to control access to the memory device. A data pointer points to a word location. The file size is 65536 word locations. A data pointer value range is from 0 to 65535.</p>

Response
<pre>* 9 Data:00705 Modem:00000 Full Locs:00705 Binary:00000 X3900 *</pre>

Pointer	Description
Data	Points to the next location to store data.
Modem	The modem pointer works with the RS232 commands to keep track of the read point for the ASCII data retrieve selections. The value of this pointer cannot be modified.
Full Loc	Displays the number of locations stored in the memory device. When the memory device is full this number will always indicate 65535.
Binary	This pointer is used by the binary XMODEM download. It pointers to the beginning of the file download. Binary downloads require presetting of the binary pointer. Use the 'p' command to set the value. The user should keep track of the pointer during each download.

5.7. b – Xmodem Data File Download

Command	Description
b	Command b starts the XMODEM download of Data file. The XMODEM protocol can be found on the Internet. Just search for “XMODEM Specification.”

Response

5.8. c – Clear the Data Memory

Command	Description
c	Command c clears all the data memory. The Error, Data, Flow Stats, and the 5-Min Flow files are cleared. The Password must be four (4) characters with leading zeros.

Response
* c Enter Password (Function Key #'s): 0000 WARNING!!!: Reset Destroys All Data! Continue? (Y) or (N)? (Press Enter to Cancel): y Resetting Data Memory - Please Wait Memory Reset Complete X7382 *

5.9. d – Set the Date

Command	Description
d	Command d sets the date.

Response
<pre>* d Enter Password (Function Key #'s): 0000 Date: 02/07/2018 X4379: 02/07/2018 Date: 02/07/2018 X1057 *</pre>

5.10. h – Print the System menu

Command	Description
h	Command h prints the System menu.

Response
<pre>* h ----- > BAM 1020 < System Menu ----- Select One of the Following: 4 - Display System Configuration 5 - Display Date / Time 6 - CSV Type Report 7 - Display Errors 8 - Display > BAM 1020 < Utility Commands 9 - Display Pointers <Esc>PT 0 - Exit Generation 2 Command Mode Press <Enter> to Exit a Selection *</pre>

5.11. p – Set the Data File Pointer

Command	Description
p	Command p sets the Data file pointer.

Response
* p Binary:00000 15 Data:00000 Modem:00000 Full Locs:00000 Binary:00015 X5037 *

5.12. t – Set the Time

Command	Description
t	Command t sets the time.

Response
* t Enter Password (Function Key #'s): 0000 Time: 13:39 X4180: 13:40 Time: 13:40 X0834 *

6. <Esc> Commands

These commands are prefaced with the Esc character (ASCII ESC) and terminated with a carriage return character (ASCII CR).

6.1. <Esc>3 – Set New Data File Pointer

Command	Description
<Esc>3 h	Set the new Data file pointer to the current time minus h hours. Command-3 will start printing from this timestamp.

Response
<Esc>3 New data pointer: 02-06-18 15:00:01 * 5 02/08/2018 13:19:39 X1208 <Esc>3 24 New data pointer: 02-07-18 13:19:47

6.2. <Esc>6 – Set New Flow State File Pointer

Command	Description
<Esc>6 h	Set the new Flow Stats file pointer to the current time minus h hours. Command-6 will start printing from this timestamp.

Response
<Esc>6 New data pointer: 02-06-18 14:08:24 * 5 02/08/2018 13:22:51 X1196 <Esc>6 24 New data pointer: 02-07-18 13:22:56

6.3. <Esc>8 – Set New 5-Min Flow File Pointer

Command	Description
<Esc>8 h	Set the new 5-Min Flow file pointer to the current time minus h hours. Command-8 will start printing from this timestamp.

Response
<Esc>8 New data pointer: 02-06-18 14:08:24 * 5 02/08/2018 13:22:51 X1196 <Esc>8 24 New data pointer: 02-07-18 13:22:56

6.4. <Esc>DT – Get or Set Date and Time

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

Response
<Esc>DT yyyy-MM-dd HH:mm:ss

Parameter	Description
yyyy	Years 2000 – 2037
MM	Months 1 – 12
dd	Days 1 – 31
HH	Hours 0 – 23
mm	Minutes 0 – 59
ss	Seconds 0 – 59

Example
<pre><Esc>DT<cr> DT 2013-01-08 11:39:23<cr><lf> <Esc>DT 2013<cr> DT 2013-01-01 00:00:00<cr><lf> <Esc>DT 20130108<cr> DT 2013-08-08 00:00:00<cr><lf> <Esc>DT 2013-01-081141<cr> DT 2013-01-08 11:41:00<cr><lf></pre>

6.5. <Esc>MN – Get or Set the Maintenance ‘M’ Flag

Command	Description
<Esc>MN	Get the Maintenance setting.
<Esc>MN ?	Get the Maintenance enumerator list.
<Esc>MN e	Set the Maintenance setting, where e is 0-OFF, 1-ON.

Response	Description
MN e-n	e – The enumerator setting. n – The enumerator name

Example
<pre><Esc>MN<cr> MN 0-OFF<cr><lf> <Esc>MN ?<cr> MN 0-OFF,1-ON<cr><lf> <Esc>MN 1<cr> MN 1-ON<cr><lf></pre>

6.6. <Esc>PT – Get or Set Protocol Type

Command	Description
<Esc>PT	Get the Protocol Type setting.
<Esc>PT ?	Get the Protocol Type enumerator list.
<Esc>PT e	Set the Protocol Type setting, where e is 0-STANDARD, 1-GENERATION 2.

Response	Description
PT e-n	e – The enumerator setting. n – The enumerator name. 0-STANDARD: Serial commands comply to this STANDARD 7500 protocol. 1-GENERATION 2: Serial commands comply to the second-generation BAM 1020 protocol.

Example
<Esc>PT<cr> PT 0-STANDARD <cr><lf> <Esc>PT ?<cr> PT 0-STANDARD,1-GENERATION 2<cr><lf> <Esc>PT 1<cr> PT 1-GENERATION 2<cr><lf>

6.7. <Esc>RV – Print Model, Firmware, Revision

Command	Description
RV	Report the model number, firmware part number, and revision string.

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

Example
<pre><Esc>RV<cr> BAM 1020, 83347, R9.0.0<cr><lf></pre>

6.8. <Esc>SS – Get the Serial Number

Command	Description
<Esc>SS	Get the product serial number.

Response	Description
<Esc>SS A99999	A99999 – Follows the MOI standard definition.

Example
<pre><Esc>SS<cr> SS A14540<cr><lf></pre>