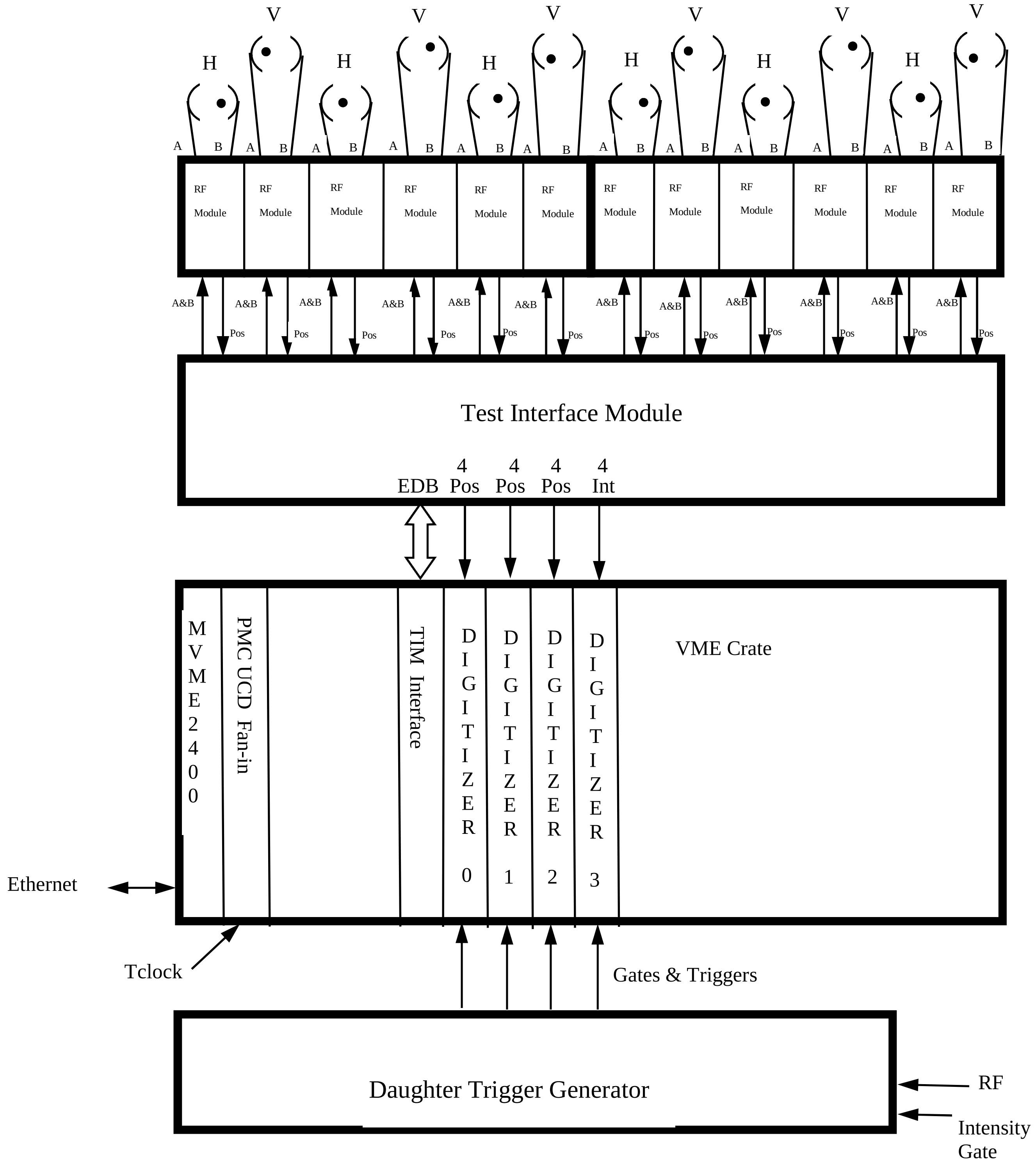
BOOSTER BEAM POSITION MONITORS USER MANUAL

REV 2.1

April 10, 2002

Typical Booster BPM System



BPM closed orbit Circular Buffer
MOOC ObjectID = 0010

Reading Property

Entry #

1

Element	**Type**	**Item**
1	int4	date
2	int4	timestamp
3	int4	beginning turn #
4	int4	number of turns
5	int4	cycle type
6 - 29	flt4	position (24)
30 - 35	flt4	intensity (6)
36-41	flt4	extra inputs(6)

Entry Length: (4 * 41)= 164 bytes

Read Sequentially by Element
Offset is a number of Entries

- Each circular buffer entry is a closed orbit taken as a result of a clock event
- (For the Booster the event is 7E)
- The number of entries in the circular buffer is 100
- Entry #1 is always the oldest set of data
- This method returns a range of elements from an entry
  The only extra inputs used as of 4/10/02 are dog leg positions at 03 and13

OMSP:
P1 = Element # (2 bytes)
P2 = Entry (2 bytes)

04/10/2002

BPM closed orbit Circular Buffer
MOOC ObjectID = 0x0011

Reading Property

Entry #

1

Element	Type	Item
1	int4	date
2	int4	timestamp
3	int4	beginning turn #
4	int4	number of turns
5	int4	cycle type
6 - 29	flt4	position (24)
30 - 35	flt4	intensity (6)
36-41	flt4	extra inputs(6)

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Read Sequentially by Entry
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- Each circular buffer entry is a closed orbit taken as a result of a clock event
- (For the Booster the event is 7E)
- The number of entries in the circular buffer is 100
- Entry #1 is always the oldest set of data
- This method returns a range of entries for one element

OMSP:
P1 = Element # (2 bytes)
P2 = Entry # (2 bytes)

04/10/2002

BPM Digitizer Control Registers
MOOC ObjectID = 0x0012

Reading and Setting Properties

Bit #	description
0	external clock enable
1	External gate enable
2	External trig enable
3	Auto reset
4	Wrap enable
5	Cirbuffer enable
6	Arm digitizer
7	Digitizer status

High byte of Control Reg
Element #1

Bit #	description
0-3	digitizer rate
4	Chan delay enable
5-6	unused
7	Software Trigger

Low byte of Control Reg
Element #2

High byte of Location counter
Element #3

Low byte of Location Counter
Element #4

High byte of Gate Duration Reg
Element #5

Low byte of Gate Duration Reg
Element #6

Bit #	description
0-1	Chan 0 delay
2-3	Chan 1 delay
4-5	Chan 2 delay
6-7	Chan 3 delay

Channel Delay Reg
Element #7

Bit #	description
0-3	Not used
4	One shot mode
5	Not used
6-7	Chan mode select

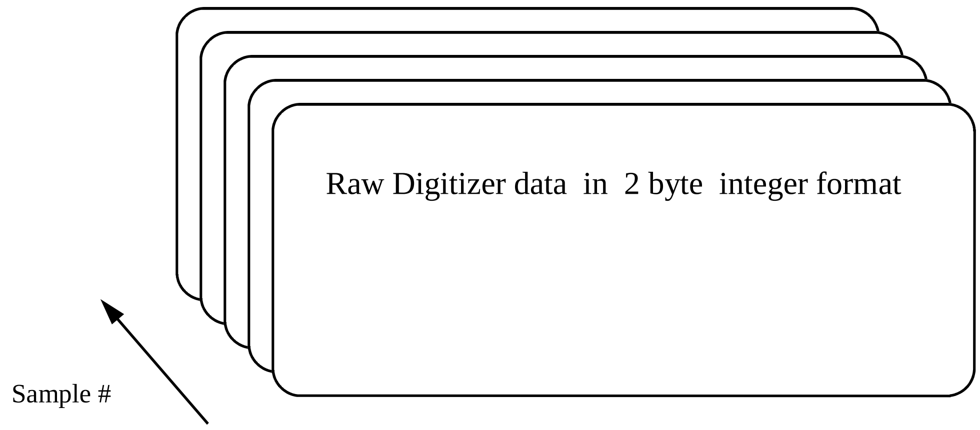
Auxillary Control Reg
Element #8

OMSP:
P1 = Element # (2 bytes)
P2 = Digitizer # (2 bytes)

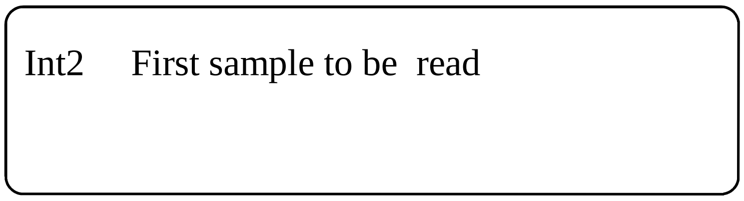
04/10/2002

BPM Digitizer Raw Data
MOOC ObjectID = 0x0013

Reading Property



Setting Property



OMSP:
P1 = Channel # (4 bytes)

BPM Average Position (Snapshot) Orbit
MOOC ObjectID = 0x0014

Reading Property

Element	Type	Item
1	int4	date
2	int4	timestamp
3	int4	beginning turn #
4	int4	number of turns
5	int4	cycle type
6 - 29	flt4	position (24)
30 - 35	flt4	intensity (6)
36-41	flt4	extra inputs(6)

Length: (4 * 41)= 164 bytes

Most recent closed orbit average positions
Taken on Booster Closed Orbit Clock Event (7E)

Setting Property

Int4 Number of Turns in the orbit average

OMSP:
P1 = Element # (2 bytes)
P2 = not used (2 bytes)

04/10/2002

BPM Turn-by-Turn Scaled Position
MOOC ObjectID = 0x0015

Reading Property

Element	type	item
1	int4	date
2	Int4	timestamp
3	int	GPS time seconds
4	int	GPS time nanoseconds
5	int4	turns taken (n<= turns taken)
6	int4	cycle type
7 to (n+6)	flt4	position(n)

Data from the last Booster Cycle

Data taking must be turned off while this is being read

Do so by toggling the basic control property

Offset is a number of elements
Length is a number of bytes

Basic Control Property

A reset will toggle data taking on and off

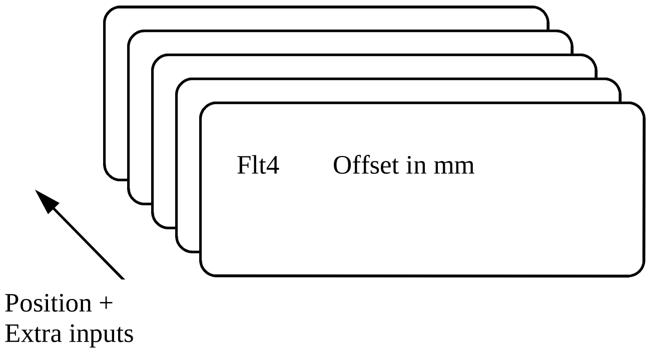
Basic Status Property

One means taking data, zero means data taking is suspended

OMSP:
P1 = Position # (2 bytes)
P2 = Element # (2 bytes)

BPM Offsets
MOOC ObjectID = 0x0016

Setting Property



Offsets are added to scaled position readings

OMSP:
P1 = Position # (2 bytes)
P2 = not used (2 bytes)

BPM Numbers
MOOC ObjectID = 0x0017

Reading Property

Element	type	description
1	int2	# of digitizers
2	int2	# of positions
3	int2	# of intensities
4	int2	# of extra inputs

OMSP:
P1 = Element # (2 bytes)
P2 = not used (2 bytes)

BPM Orbit Group
MOOC ObjectID = 0x001E

Reading Property

Element	Type	Item
1	int4	date
2	int4	timestamp
3	int4	beginning turn #
4	int4	number of turns
5	int4	cycle type
6 - 29	flt4	position (24)
30 - 35	flt4	intensity (6)
36-41	flt4	extra inputs(6)

Orbit #

These up to 100 orbits are all from the Same Booster cycle

Position is in mm

Offset is a number of orbits
Length is a number of bytes

Setting Property

Element	type	description
1	int4	# of turns
2	int4	# of orbits
3	int4	# of turns to skip
4	int4	beginning turn #

Basic Control Property

A reset will toggle data taking on and off

Basic Status Property

One means taking data, zero means data taking is suspended

OMSP:
P1 = Element # (2 bytes)
P2 = orbit # (2 bytes)

04/10/2002

BPM Single Turn Scaled Position
MOOC ObjectID = 0x001F

Reading Property

Element	Type	Item
1	int4	date
2	int4	timestamp
3	int4	turn number
4	int4	number of turns
5	int4	cycle type
6 - 29	flt4	position (24)
30 - 35	flt4	intensity (6)
36-41	flt4	extra inputs(6)

Length: (4 * 41)= 164 bytes

Data for most recent Booster Beam cycle
Taken on Flash Clock Event (7F)

OMSP:
P1 = Not used (2 bytes)
P2 = Element # (2 bytes)

BPM Single Turn Scaled Position Buffer
MOOC ObjectID = 0x0020

Reading Property

Element	Type	Item
1	int4	date
2	int4	timestamp
3	int4	turn number
4	int4	number of turns
5	int4	cycle type
6 - 29	flt4	position (24)
30 - 35	flt4	intensity (6)
36-41	flt4	extra inputs(6)

Length: (4 * 41)= 164 bytes

Buffer of the Last 100 flashes
Taken on Flash Clock Event (7F)

Entry #

OMSP:
P1 = Element # (2 bytes)
P2 = Entry # (2 bytes)

04/10/2002

BPM RF Test Device
MOOC ObjectID = 0x0021

Reading Property

OMSP TEST TYPE = 0

Element	Type	Item
1	int4	date
2	int4	timestamp
3-26	flt4	A=B data (24)
27-50	flt4	A>B data (24)
51-74	flt4	A<B data (24)

data is in mm

OMSP TEST TYPE = 1

Element	Type	Item
1	int4	date
2	int4	timestamp
3-162	flt4	cable & PS volts

Setting Property

Test Flag :
0 == no test
1 == Run RF test
4 == Run Cable & PS test

These run procedures that Take the data returned in the Reading Property

Basic Control Property

Sets bits to Test Interface Module via External Device Bus

Used to turn on and off RF and attenuation for display through the Application Plotting facility

0 == off
2 == RF on
4 == A attenuated
8 == B attenuated

Basic Status Property

Status from Test Interface Module via External Device Bus

Used to read status of RF and attenuation see bits from Basic Control Property

OMSP:
P1 = Test type (2 bytes)
P2 = Entry # (2 bytes)

Updated 2/4/02

BPM Orbit Correction Device
MOOC ObjectID = 0x0022

Setting Property

Entry	Type	Item
1	Int2	Clock Event
2	Int2	# of Events after a 0x12 event
3	Int2	count of events after a 0x12 event

(entry 3 is really a reading of the counter - you can't set it)

Reading Property

Element	Type	Item
1	int4	date
2	int4	timestamp
3	int4	beginning turn #
4	int4	number of turns
5	int4	cycle type
6 - 29	flt4	position (24)
30 - 35	flt4	intensity (6)
36-41	flt4	extra inputs(6)

Entry #

OMSP:
P1 = Element # (2 bytes)
P2 = Entry # (2 bytes)

04/10/2002

BPM Turn-by-Turn Extra Inputs
MOOC ObjectID = 0x0023

Reading Property

Element	type	item
1	int4	date
2	Int4	timestamp
3	int	GPS time seconds
4	int	GPS time nseconds
5	int4	turns taken (n<= turns taken)
6	int4	cycle type
7 to (n+6)	flt4	position(n)

Data from the last Booster Cycle

Data taking must be turned off while this is being read

Do so by toggling the basic control property

Offset is a number of elements
Length is a number of bytes

Basic Control Property

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Basic Status Property

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OMSP:
P1 = Channel # (2 bytes)
P2 = Element # (2 bytes)

11/2152004