Slow Control to DAQ communication protocol

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The whole communication is, because of different systems (big/little endian), doing in STRINGs.

Table 1 shows the available command structure. All other tables are describing the back coming values.

Table 1

	command	prefix 1	prefix 2	comment	comment
1.)	run			not used	send UNIX sec back (up to now)
2.)	reset			not used	only a "#" is send back
3.)	control			getting actual stage position	stage position (table 1) is send back, after all movement has been stopped
4.)	position	x pos	y pos	x and y position [mm/10]	actual position, after stage stops [mm/10]
5.)	readout			Not defined	Not defined
6.)	readout	mod	1 .. 38	get data for module 1 to 38	sending parameters for module 1 to 38
7.)	readout	CERN	<command>	beam parameters	sending parameters of CERN beam

1.) **run**

not defined up to now
send by DAQ: run#
receive: <UNIX seconds>#

examples:
send: *run#*
receive: *1147349593#*

2.) **reset**

not defined up to now
send by DAQ: reset#
receive: #

examples:
send: *“reset#”*
receive: *“#”*

3.) **control**

ask for the actual stage position. A result is coming back when stage is not moving
send by DAQ: control#
receive: <timestamp in UNIX sec> <x position of stage [mm/10]> <y position of stage [mm/10]> #

examples: *the actual position shall be displayed (x=123.5mm and y=60.8mm)*
send: *“control#”*
receive: *“1147349593 1235 608#”*

4.) **position**

force the stage to go to a specific position and wait until it reaches the position.
send by DAQ: position <x pos [mm/10]> <y pos [mm/10]>#
receive: <timestamp in UNIX sec> <x position of stage [mm/10]> <y position of stage [mm/10]> #

examples: *the stage has to move to x=123.5mm and y=60.8mm*

send: *"position 1235 608#"*
receive: *"1147349593 1235 608#"*

5.) **readout**

not defined

6.) readout mod 1..38

the actual status of modules 1 to 38 shall send from SC to DAQ
send by DAQ readout mod <1 to 38>#
receive <timestamp> <module no> <data 3> … <data 39>#

see *Table 2, Modules*

7.) **readout CERN <command>**

getting data of CERN beam

The beam data is getting out of the CERN database "measdb". This connection take some time (1-3 seconds) from the CERN side. Hence we are starting at first a request for downloading data of the relevant H6 beam, and after this a special request can start for getting the actual data.

Not used anymore, but when sending this command, a OK will come back (21.Sep.2006):
~~Do the following command only at the time you want to get new data of the SPS ORACLE database.~~
~~send by DAQ: readout CERN getNewBeamData#~~
~~receive: OK#~~

After that, you're be able to ask for special data:
send by DAQ: readout CERN <part of the name CERN database name>
receive: <timestampSPS> <timestampSC> <data 1> … <data n># (depending on number of entries in db)

example:

send	receive
readout CERN getNewBeamData#	OK#
readout CERN TRIM#	<timestampSPS> <timestampSC> and 12 values#
readout CERN TRIM01#	<timestampSPS> <timestampSC> and 2 values#
readout CERN COLL#	<timestampSPS> <timestampSC> and 44 values#

See table 3 for possible values

Table 2, Modules

Data	Comment	unit
1	timestamp	UNIX sec
2	module No	1 .. 38
3	CMB temp 1	°C
4	CMB temp 2	°C
5	CMB temp 3	°C
6	CMB temp 4	°C
7	CMB temp 5	°C
8	CMB temp lower	°C
9	CMB temp upper	°C
10	CMB V_calib_at_U041	V
11	CMB power 12V	V
12	CMB REF_1.235V	V
13	CMB VLD_upper_CMB	V

14	CMB VLB upper	V
15	CMB VLB upper	V
16	CMB VLD for LED	V
17	CMB 10V bias	V
18	CMB W calib at U051	V
19	CMB LED settings	0 .. 65535 (int)
20	CMB width	0 .. 255 (int)
21	CMB height	0 .. 255 (int)
22	CMB 12V extern	V
23	CMB 12V current extern	A
24	HBAB temp top 1	°C
25	HBAB temp top 2	°C
26	HBAB temp bot 1	°C
27	HBAB temp bot 2	°C
28	HBAB HV Volt top	V
29	HBAB HV Volt bot	V
30	HBAB HV Cur top	A
31	HBAB HV Cur bot	A
32	HBAB LV Volt top	V
33	HBAB LV Volt bot	V
34	HBAB LV Cur top	A
35	HBAB LV Cur bot	A
36	HBAB LVn Volt top	V
37	HBAB LVn Volt top	V
38	HBAB LVn Cur top	A
39	HBAB LVn Cur bot	A

Table 3, CERN

Variable name	Description
6POL01:I_MEAS	Measured current of 6POL01
6POL01:I_REF	Reference current of 6POL01
6POL02:I_MEAS	Measured current of 6POL02
6POL02:I_REF	Reference current of 6POL02
ABSORBER01:POS	Measured position of ABSORBER01
BEND01:I_MEAS	Measured current of BEND01
BEND01:I_REF	Reference current of BEND01
BEND02:I_MEAS	Measured current of BEND02
BEND02:I_REF	Reference current of BEND02
BEND03:I_MEAS	Measured current of BEND03
BEND03:I_REF	Reference current of BEND03
BEND04:I_MEAS	Measured current of BEND04
BEND04:I_REF	Reference current of BEND04
BEND05:I_MEAS	Measured current of BEND05
BEND05:I_REF	Reference current of BEND05
BEND06:I_MEAS	Measured current of BEND06
BEND06:I_REF	Reference current of BEND06
BEND07:I_MEAS	Measured current of BEND07
BEND07:I_REF	Reference current of BEND07
BEND09:I_MEAS	Measured current of BEND09
BEND09:I_REF	Reference current of BEND09
COLL01:POS_JAW1_MEAS	Measured jaw 1 position of COLL01
COLL01:POS_JAW1_REF	Reference jaw 1 position of COLL01
COLL01:POS_JAW2_MEAS	Measured jaw 2 position of COLL01
COLL01:POS_JAW2_REF	Reference jaw 2 position of COLL01
COLL02:POS_JAW1_MEAS	Measured jaw 1 position of COLL02
COLL02:POS_JAW1_REF	Reference jaw 1 position of COLL02

COLL02:POS_JAW2_MEAS	Measured jaw 2 position of COLL02
COLL02:POS_JAW2_REF	Reference jaw 2 position of COLL02
COLL03:POS_JAW1_MEAS	Measured jaw 1 position of COLL03
COLL03:POS_JAW1_REF	Reference jaw 1 position of COLL03
COLL03:POS_JAW2_MEAS	Measured jaw 2 position of COLL03
COLL03:POS_JAW2_REF	Reference jaw 2 position of COLL03
COLL05:POS_JAW1_MEAS	Measured jaw 1 position of COLL05
COLL05:POS_JAW1_REF	Reference jaw 1 position of COLL05
COLL05:POS_JAW2_MEAS	Measured jaw 2 position of COLL05
COLL05:POS_JAW2_REF	Reference jaw 2 position of COLL05
COLL06:POS_JAW1_MEAS	Measured jaw 1 position of COLL06
COLL06:POS_JAW1_REF	Reference jaw 1 position of COLL06
COLL06:POS_JAW2_MEAS	Measured jaw 2 position of COLL06
COLL06:POS_JAW2_REF	Reference jaw 2 position of COLL06
COLL08:POS_JAW1_MEAS	Measured jaw 1 position of COLL08
COLL08:POS_JAW1_REF	Reference jaw 1 position of COLL08
COLL08:POS_JAW2_MEAS	Measured jaw 2 position of COLL08
COLL08:POS_JAW2_REF	Reference jaw 2 position of COLL08
COLL09:POS_JAW1_MEAS	Measured jaw 1 position of COLL09
COLL09:POS_JAW1_REF	Reference jaw 1 position of COLL09
COLL09:POS_JAW2_MEAS	Measured jaw 2 position of COLL09
COLL09:POS_JAW2_REF	Reference jaw 2 position of COLL09
COLL10:POS_JAW1_MEAS	Measured jaw 1 position of COLL10
COLL10:POS_JAW1_REF	Reference jaw 1 position of COLL10
COLL10:POS_JAW2_MEAS	Measured jaw 2 position of COLL10
COLL10:POS_JAW2_REF	Reference jaw 2 position of COLL10
COLL11:POS_JAW1_MEAS	Measured jaw 1 position of COLL11
COLL11:POS_JAW1_REF	Reference jaw 1 position of COLL11
COLL11:POS_JAW2_MEAS	Measured jaw 2 position of COLL11
COLL11:POS_JAW2_REF	Reference jaw 2 position of COLL11
H6A_EXPT01:COUNTS	Measured counts of H6A_EXPT01
H6A_EXPT02:COUNTS	Measured counts of H6A_EXPT02
H6A_EXPT03:COUNTS	Measured counts of H6A_EXPT03
H6A_EXPT04:COUNTS	Measured counts of H6A_EXPT04
H6B_EXPT01:COUNTS	Measured counts of H6B_EXPT01
H6B_EXPT02:COUNTS	Measured counts of H6B_EXPT02
H6B_EXPT03:COUNTS	Measured counts of H6B_EXPT03
H6B_EXPT04:COUNTS	Measured counts of H6B_EXPT04
H6C_EXPT01:COUNTS	Measured counts of H6C_EXPT01
H6C_EXPT02:COUNTS	Measured counts of H6C_EXPT02
H6C_EXPT03:COUNTS	Measured counts of H6C_EXPT03
H6C_EXPT04:COUNTS	Measured counts of H6C_EXPT04
QUAD01:I_MEAS	Measured current of QUAD01
QUAD01:I_REF	Reference current of QUAD01
QUAD02:I_MEAS	Measured current of QUAD02
QUAD02:I_REF	Reference current of QUAD02
QUAD03:I_MEAS	Measured current of QUAD03
QUAD03:I_REF	Reference current of QUAD03
QUAD04:I_MEAS	Measured current of QUAD04
QUAD04:I_REF	Reference current of QUAD04
QUAD05:I_MEAS	Measured current of QUAD05
QUAD05:I_REF	Reference current of QUAD05
QUAD06:I_MEAS	Measured current of QUAD06
QUAD06:I_REF	Reference current of QUAD06
QUAD07:I_MEAS	Measured current of QUAD07
QUAD07:I_REF	Reference current of QUAD07
QUAD08:I_MEAS	Measured current of QUAD08
QUAD08:I_REF	Reference current of QUAD08

QUAD09:I_MEAS	Measured current of QUAD09
QUAD09:I_REF	Reference current of QUAD09
QUAD10:I_MEAS	Measured current of QUAD10
QUAD10:I_REF	Reference current of QUAD10
QUAD11:I_MEAS	Measured current of QUAD11
QUAD11:I_REF	Reference current of QUAD11
QUAD12:I_MEAS	Measured current of QUAD12
QUAD12:I_REF	Reference current of QUAD12
QUAD13:I_MEAS	Measured current of QUAD13
QUAD13:I_REF	Reference current of QUAD13
QUAD14:I_MEAS	Measured current of QUAD14
QUAD14:I_REF	Reference current of QUAD14
QUAD15:I_MEAS	Measured current of QUAD15
QUAD15:I_REF	Reference current of QUAD15
QUAD16:I_MEAS	Measured current of QUAD16
QUAD16:I_REF	Reference current of QUAD16
RP_EXPT01:COUNTS	Measured counts of RP_EXPT01
RP_EXPT02:COUNTS	Measured counts of RP_EXPT02
RP_EXPT03:COUNTS	Measured counts of RP_EXPT03
RP_EXPT04:COUNTS	Measured counts of RP_EXPT04
RP_EXPT05:COUNTS	Measured counts of RP_EXPT05
RP_EXPT06:COUNTS	Measured counts of RP_EXPT06
RP_EXPT07:COUNTS	Measured counts of RP_EXPT07
RP_EXPT08:COUNTS	Measured counts of RP_EXPT08
SCINT01:COUNTS	Measured counts of SCINT01
SCINT04:COUNTS	Measured counts of SCINT04
SCINT05:COUNTS	Measured counts of SCINT05
SCINT06:COUNTS	Measured counts of SCINT06
SCINT07:COUNTS	Measured counts of SCINT07
SCINT08:COUNTS	Measured counts of SCINT08
SCINT09:COUNTS	Measured counts of SCINT09
T4:POS	Measured position of T4
TARGET01:POS	Measured position of TARGET01
TRIM01:I_MEAS	Measured current of TRIM01
TRIM01:I_REF	Reference current of TRIM01
TRIM02:I_MEAS	Measured current of TRIM02
TRIM02:I_REF	Reference current of TRIM02
TRIM03:I_MEAS	Measured current of TRIM03
TRIM03:I_REF	Reference current of TRIM03
TRIM04:I_MEAS	Measured current of TRIM04
TRIM04:I_REF	Reference current of TRIM04
TRIM05:I_MEAS	Measured current of TRIM05
TRIM05:I_REF	Reference current of TRIM05
TRIM06:I_MEAS	Measured current of TRIM06
TRIM06:I_REF	Reference current of TRIM06