Present status of the individual systems analysis applications

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1. Introduction
2. Automatic analysis for the HWC
3. Manual analysis for experts
4. Status of the applications
5. Conclusions

1. Introduction

1. Introduction

Three main clients are already involved with the PM analysis:

- AT-MEL for the surface & tunnel HWC of the Quench Protection Systems
- AB-CO-MI for the HWC of the Power Interlock Systems
- AB-PO for the HWC of the Power Converters installed in the LHC

1. Introduction

Following several periodical meetings and specifications related to the SACEC and GLOBAL ANALYSIS, 2 types of tools have been developed by our section:

- Automated analysis tools used via the Sequencer for the HWC

- Dedicated applications for the experts (based on the same analysis)

2. Automatic analysis for the HWC

2. Automatic analysis for the HWC

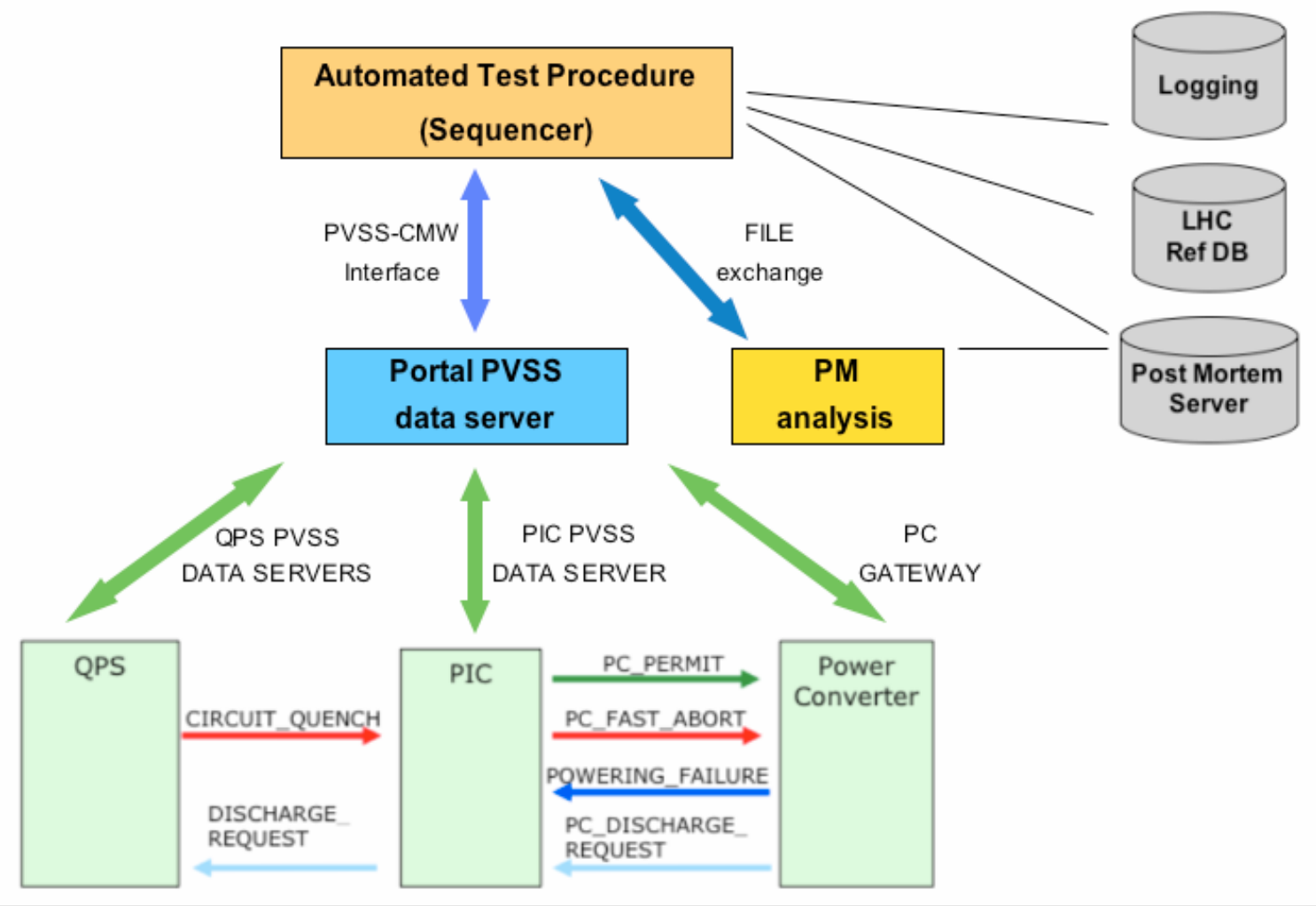
In the framework of the Hardware Commissioning, a test manager application has been developed (AB/CO-AP): the **SEQUENCER**

- It gives the possibility to set & execute sequence of steps

- Each sequence consists of a set of instructions

- The instructions allow status read & real actions on the QPS, PIC & PC systems in the LHC tunnel

2.1 Architecture of the systems



2.2 Sequence of a test

When a test is launched by the SEQUENCER:

- Instructions & parameters are sent on the equipments according to the test (short circuit, interlock, powering to nominal)

- Test data are sent to the PM Automatic Analysis (localization, test type, circuit name…)

- When PM files are available, they are read from the PM server, and analysis are started

- Then status (OK / FAILED) is returned by the PMAA to the Sequencer

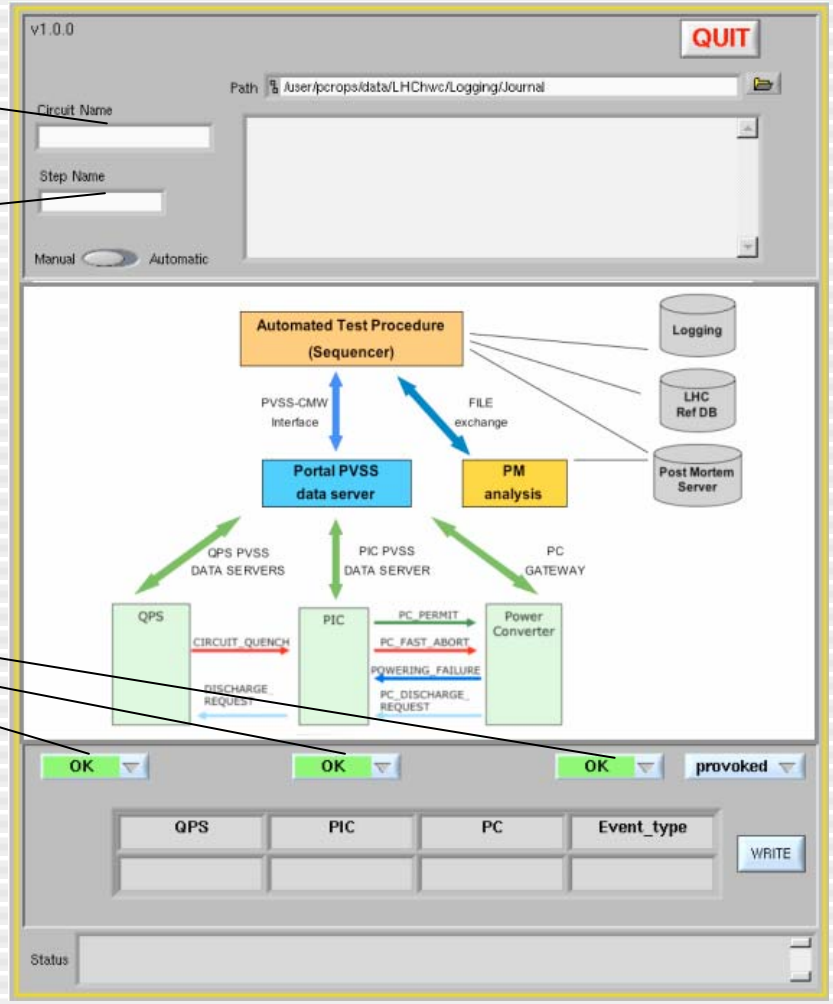
- According to the result, the next step will be executed or not

2.3 Draft panel of the PM Automatic Analysis

Circuit Name

Step Name

Result of the analysis



2.4 Sequence of the PM Automatic Analysis

From the PMAA side:

- A loader is waiting for the PM files on the PM server, according to the test data (circuit name…)

- When a PM file is available, the specific analysis is executed and the result is returned to the Sequencer

- When the results from the 3 analysis are generated:

  - IF all is OK, a new test can be launched

  - ELSE manual analysis should be done by an expert

2.5 Actual status of the Sequencer

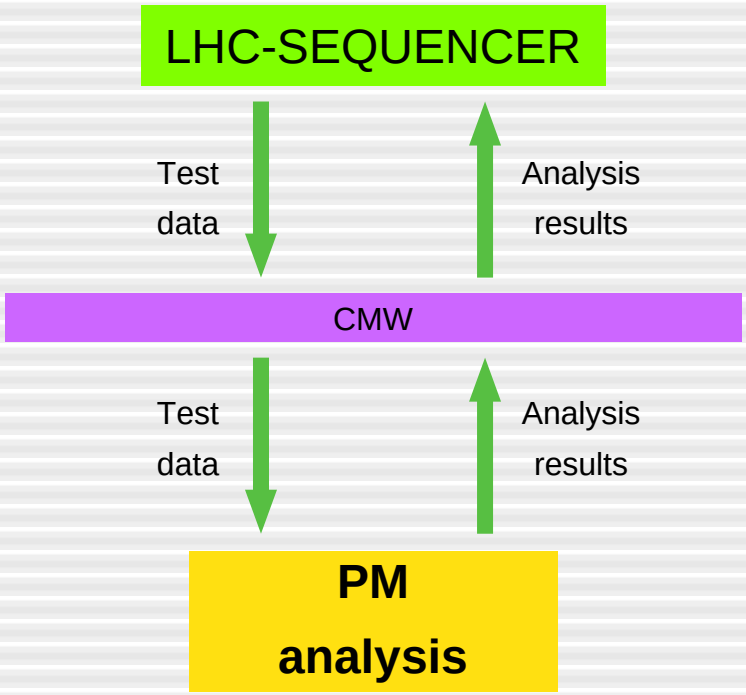
- The software developed for the Sequencer is going to be integrated in the LHC-SEQUENCER (general sequencer for LHC physics & hardware)

- The “old” Sequencer application will still be used for the long test (i.e. Dry Run)

- PIC1, PIC2 tests will be managed via the LHC-SEQUENCER

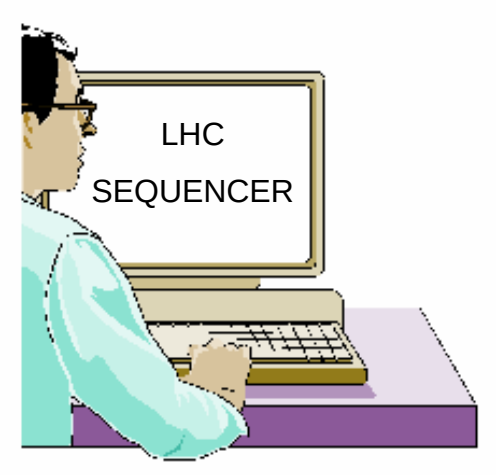
  - Should be available mid February/March
  - Interaction with PMAA must be redesigned

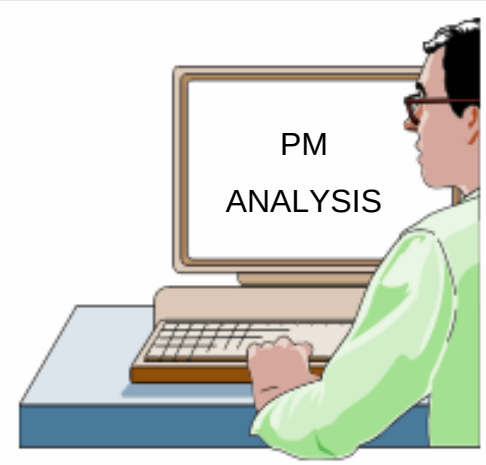
2.5 Actual status of the Sequencer



2.5 Actual status of the Sequencer

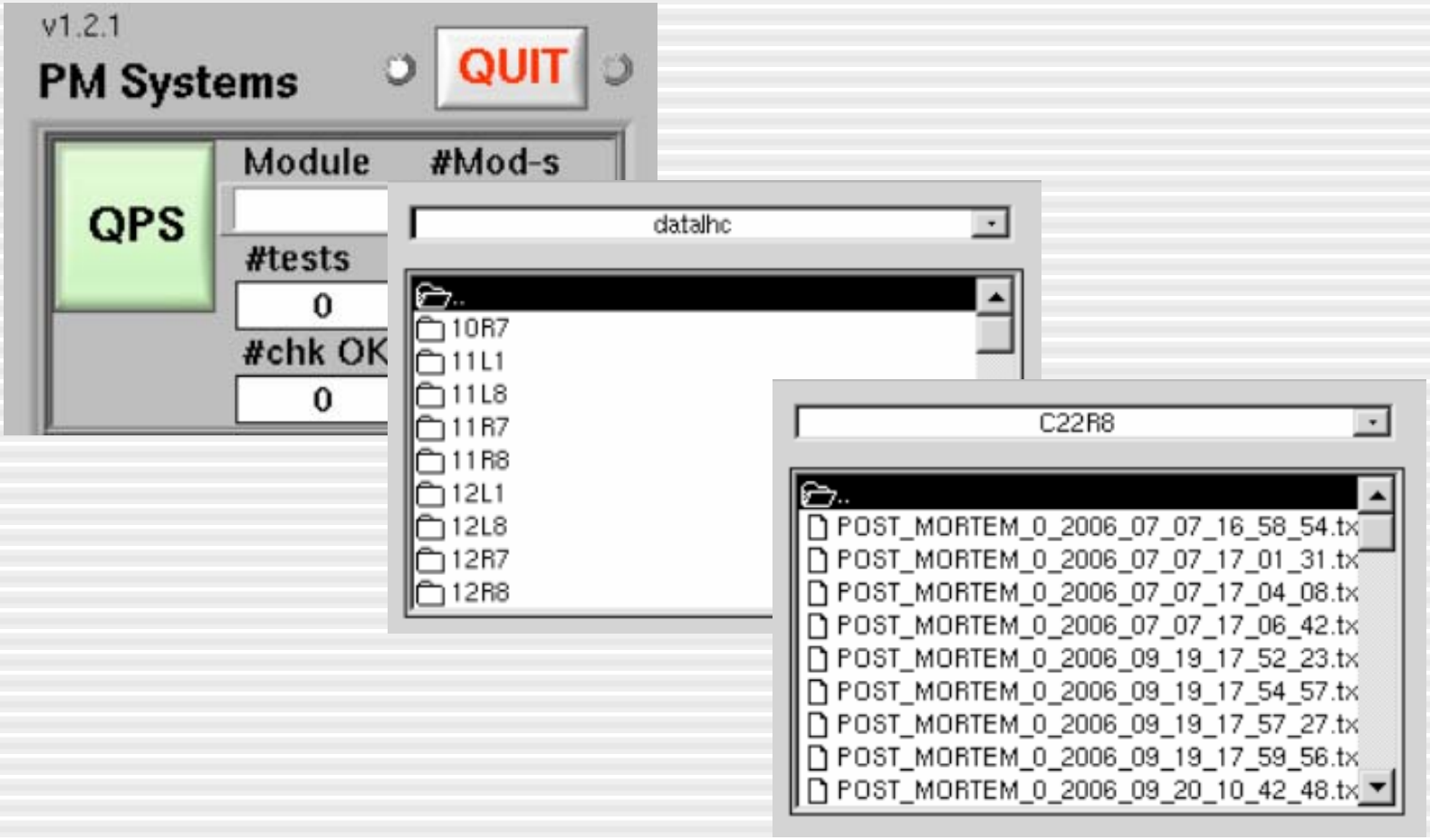
- In case of problems at the beginning, oral communication between 2 operators is still foreseen



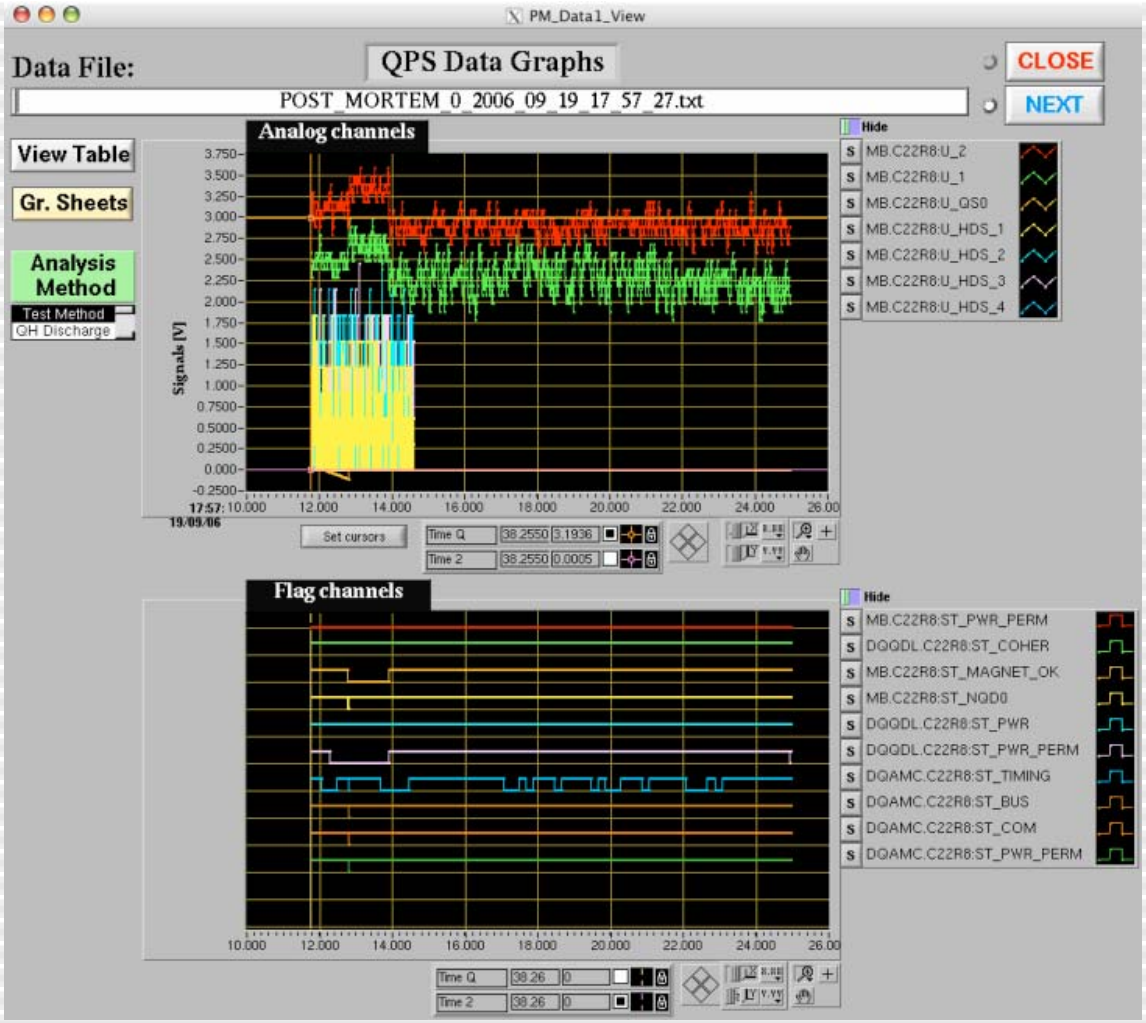


3. Manual analysis for experts

3.1 QPS Expert Analysis



3.1 QPS Expert Analysis



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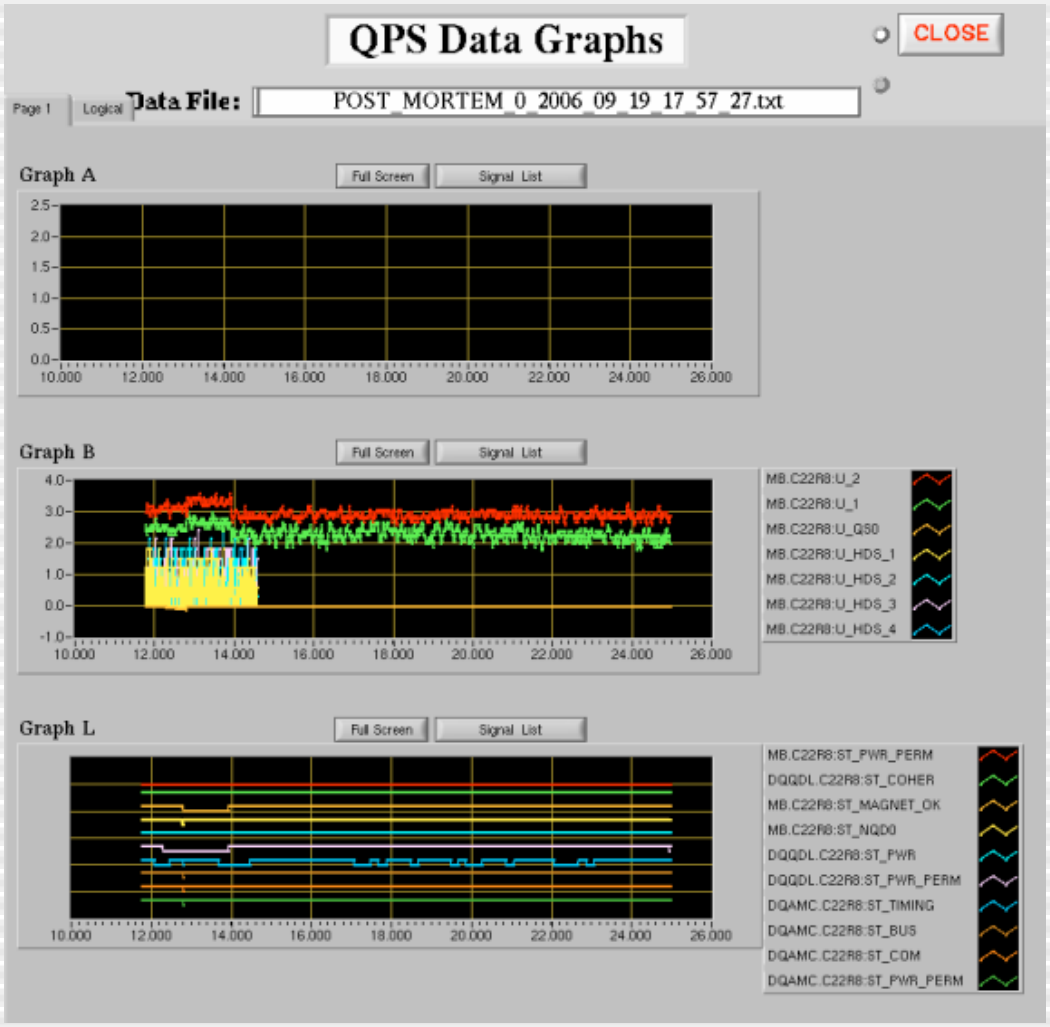
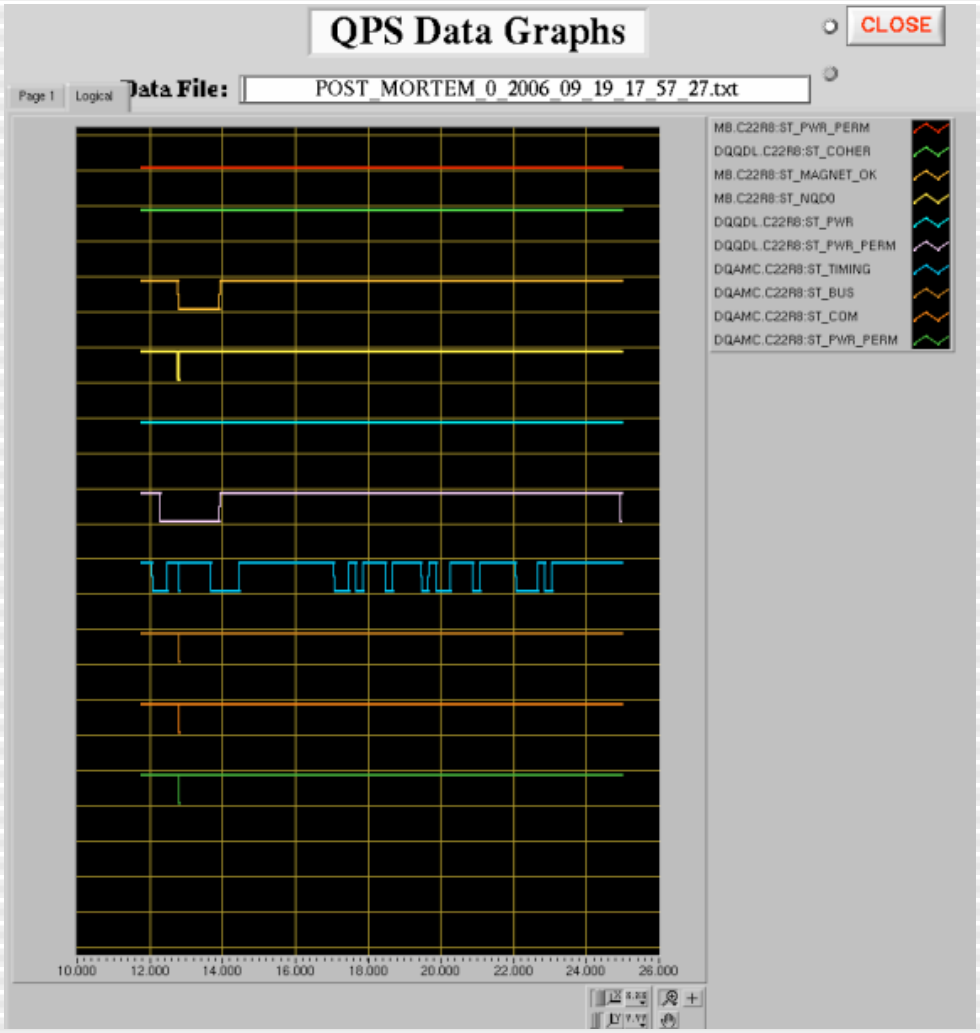


3.1 QPS Expert Analysis



3.1 QPS Expert Analysis

PM (QPS) Table Text

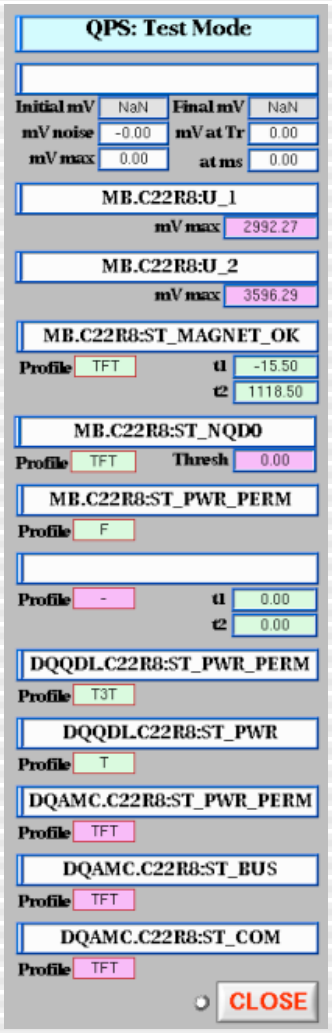
Columns to show CLOSE

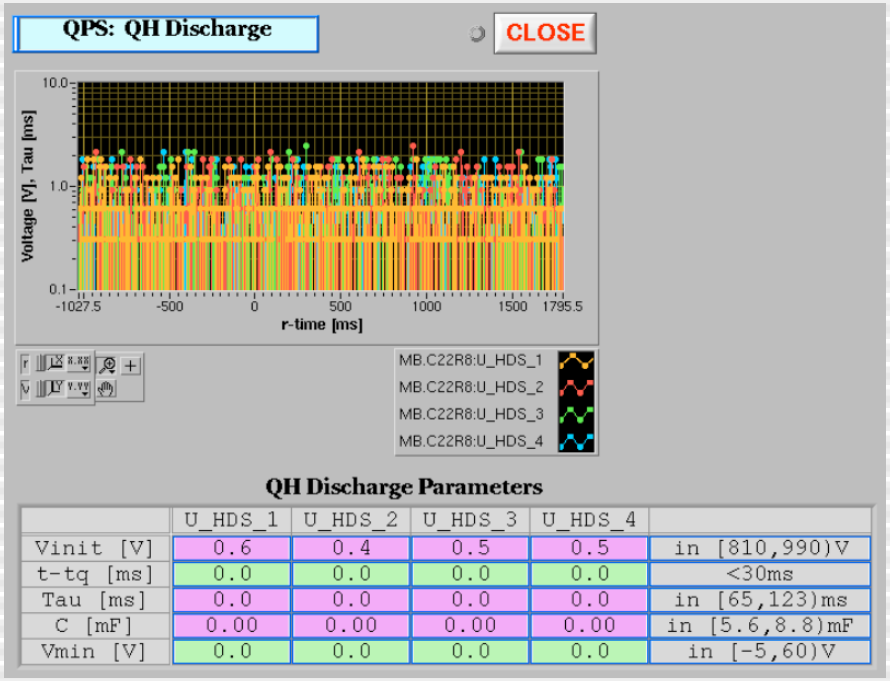
Data File: POST_MORTEM_0_2006_09_19_17_57_27.txt

All Act Sel(#0)

	[21] DQAMC.C22R8: ST_BUS	[22] DQAMC.C22R8: ST_COM	[23] DQAMC.C22R8: ST_PWR_PERM	[24] MB.C22R8: U_2	[25] MB.C22R8: U_1	[26] MB.C22R8: U_QS0	[27] MB.C22R8: U_HDS_1	[28] MB.C22R8: U_HDS_2
11.766	T	T	T	-203.18	-203.985	0.0042122	0.92007	1.84014
11.772	T	T	T	9.33448	2.58959	0.000793397	0	1.84014
11.777	T	T	T	2.99227	2.58959	0.000671297	0	0.30669
11.782	T	T	T	2.99227	2.48892	0.0010376	0.61338	0.61338
11.787	T	T	T	2.99227	2.38825	0.000671297	1.22676	0
11.792	T	T	T	2.99227	2.38825	0.0014039	0.61338	0.61338
11.797	T	T	T	2.99227	2.28758	0.000915497	0	0.61338
11.803	T	T	T	3.09294	2.28758	0.000793397	0.30669	0.30669
11.808	T	T	T	3.19361	2.28758	0.000304997	0	1.53345
11.813	T	T	T	3.19361	2.38825	0.0014039	0	0
11.818	T	T	T	3.29428	2.38825	0.0012818	0.61338	0
11.823	T	T	T	3.29428	2.38825	0.000549197	1.84014	0
11.828	T	T	T	3.19361	2.48892	0.000793397	0.61338	0.30669
11.834	T	T	T	3.19361	2.48892	0.001526	0	0
11.839	T	T	T	3.19361	2.48892	0.0018923	0.30669	0.30669
11.844	T	T	T	2.99227	2.48892	0.000182897	0	0.92007
11.849	T	T	T	2.99227	2.38825	0.000671297	0.92007	0.30669
11.854	T	T	T	2.99227	2.38825	0.0014039	0.61338	0
11.859	T	T	T	2.99227	2.38825	0.000427097	1.84014	0
11.865	T	T	T	2.8916	2.38825	-0.000305503	0.30669	0.61338
11.870	T	T	T	2.99227	2.38825	0.001526	0.61338	0.61338
11.875	T	T	T	2.99227	2.48892	-0.000549703	0.61338	2.14683
11.881	T	T	T	2.8916	2.48892	0.000427097	0.61338	0.30669
11.886	T	T	T	2.99227	2.48892	0.0022586	0	0
11.891	T	T	T	2.8916	2.58959	0.0010376	0.30669	0
11.896	T	T	T	2.99227	2.58959	0.0023807	1.53345	0
11.901	T	T	T	2.99227	2.48892	6.07967e-05	0.61338	0.61338
11.906	T	T	T	3.09294	2.48892	0.0014039	1.84014	0.92007
11.912	T	T	T	3.19361	2.48892	0.0022586	0.30669	0
11.917	T	T	T	3.09294	2.48892	0.000427097	0	1.53345
11.922	T	T	T	3.09294	2.48892	0.000915497	0.92007	0.30669
11.927	T	T	T	3.09294	2.48892	0.000915497	0.61338	0
11.932	T	T	T	3.09294	2.48892	0.0010376	1.53345	0
11.937	T	T	T	2.99227	2.38825	0.0014039	0	0.30669
11.943	T	T	T	3.09294	2.48892	0.001526	0	0
11.948	T	T	T	3.09294	2.48892	-6.13033e-05	0.30669	0.30669
11.953	T	T	T	3.09294	2.58959	0.000304997	1.22676	0
11.958	T	T	T	3.19361	2.48892	0.0010376	1.22676	0.30669
11.963	T	T	T	3.19361	2.58959	0.0022586	0.61338	0

3.1 QPS Expert Analysis

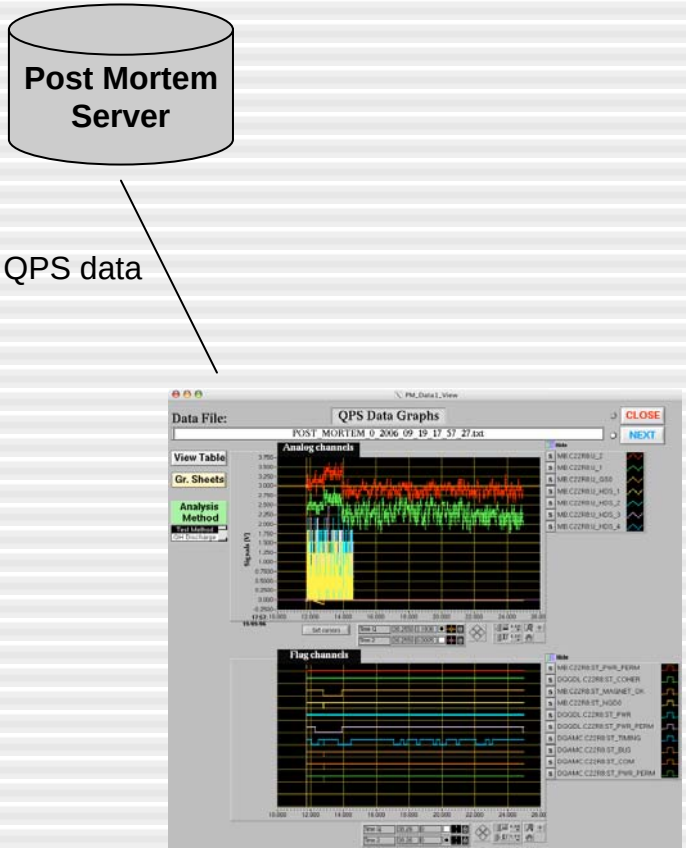




QH Discharge Parameters

	U_HDS_1	U_HDS_2	U_HDS_3	U_HDS_4	
Vinit [V]	0.6	0.4	0.5	0.5	in [810,990)V
t-tq [ms]	0.0	0.0	0.0	0.0	<30ms
Tau [ms]	0.0	0.0	0.0	0.0	in [65,123)ms
C [mF]	0.00	0.00	0.00	0.00	in [5.6,8.8)mF
Vmin [V]	0.0	0.0	0.0	0.0	in [-5,60)V

3.1 QPS Expert Analysis



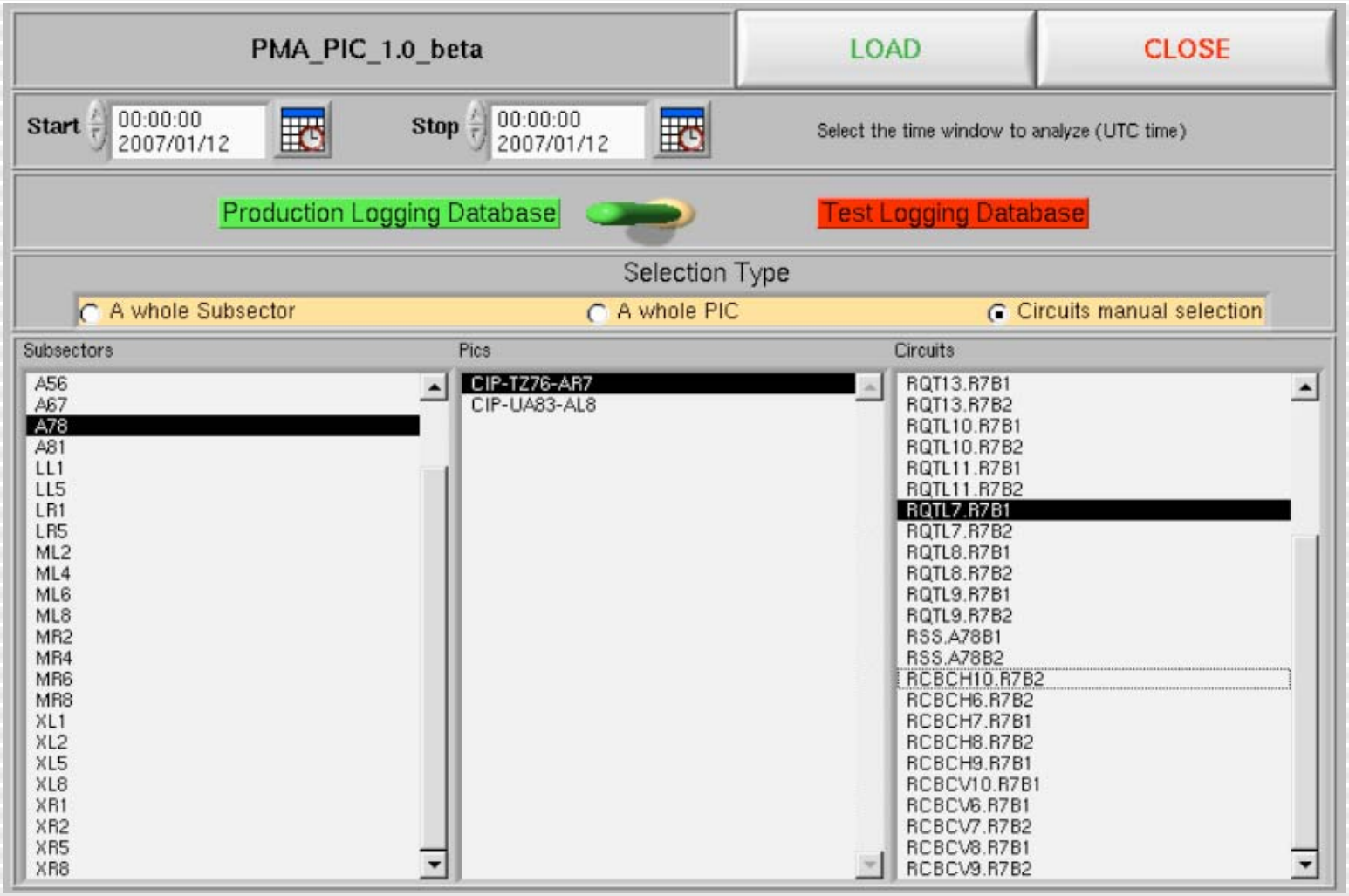
3.1 QPS Expert Analysis

The QPS expert application can be used:

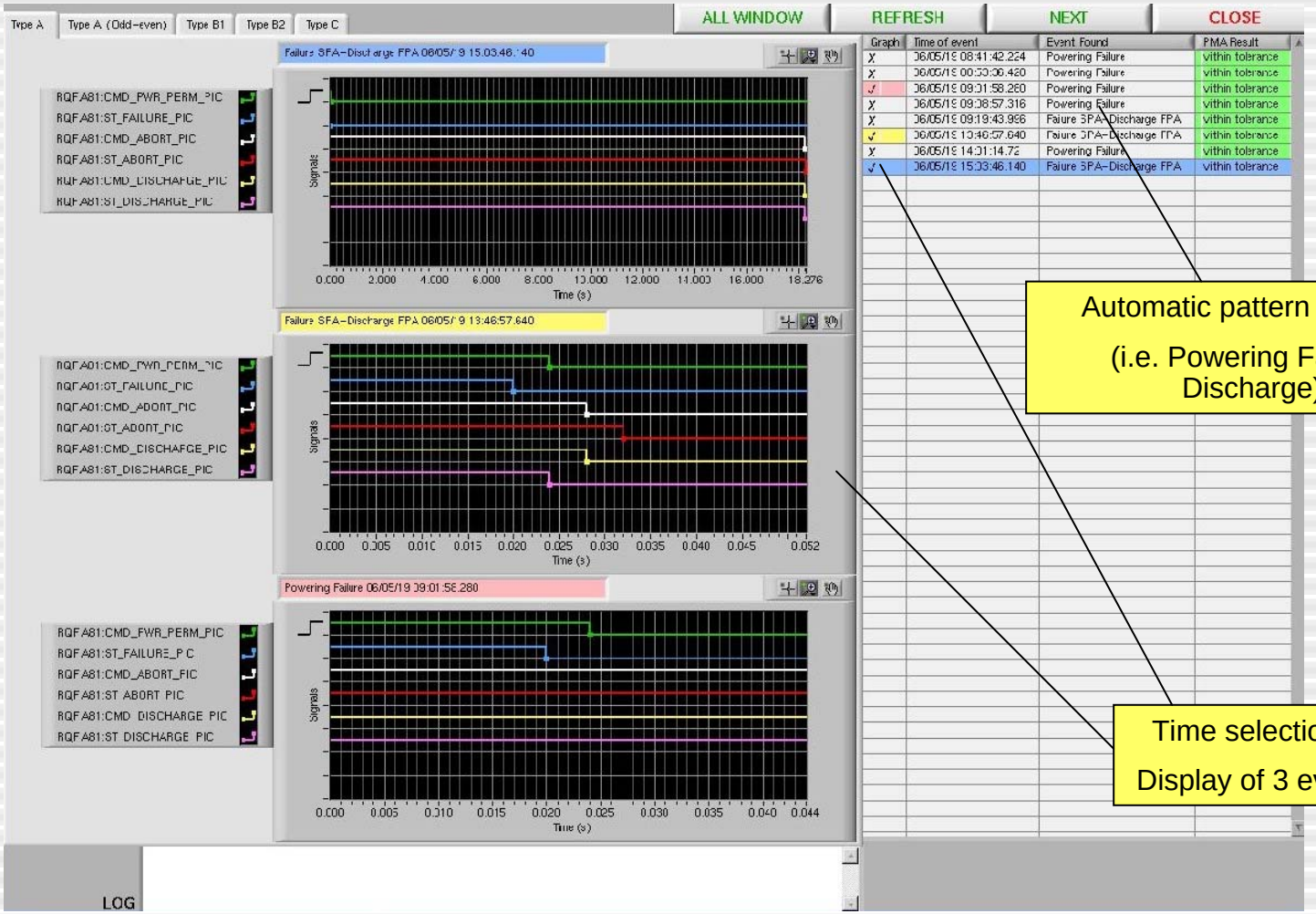
- Magnet protection systems validation during reception phase

- HWC of the systems installed in the tunnel

3.2 PIC Expert Analysis



3.2 PIC Expert Analysis



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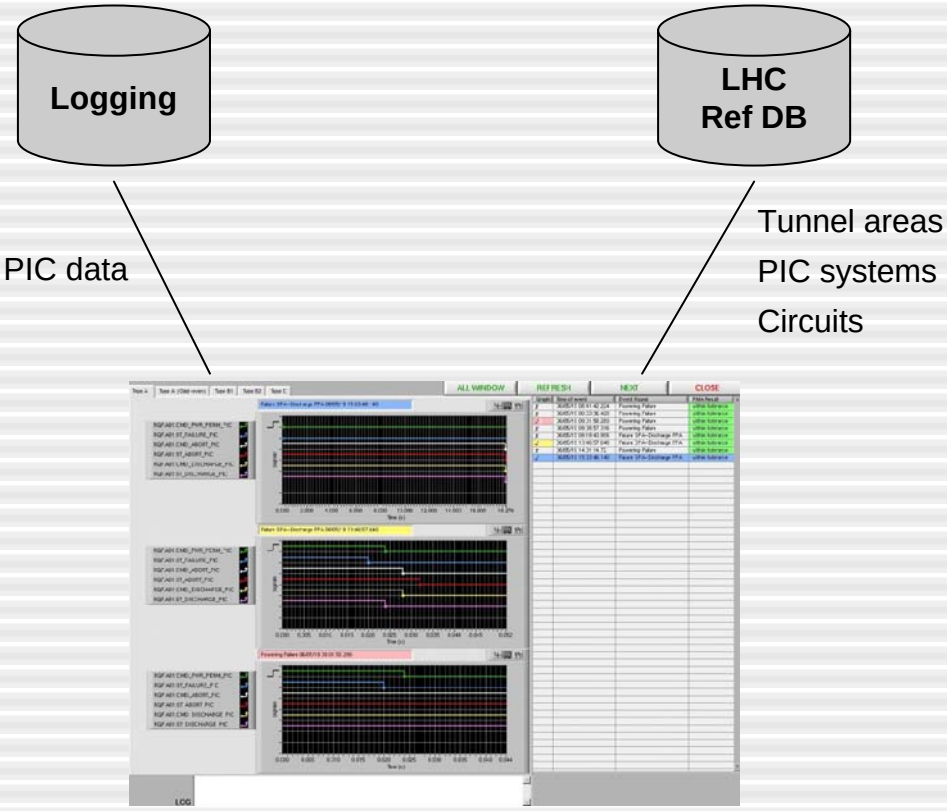
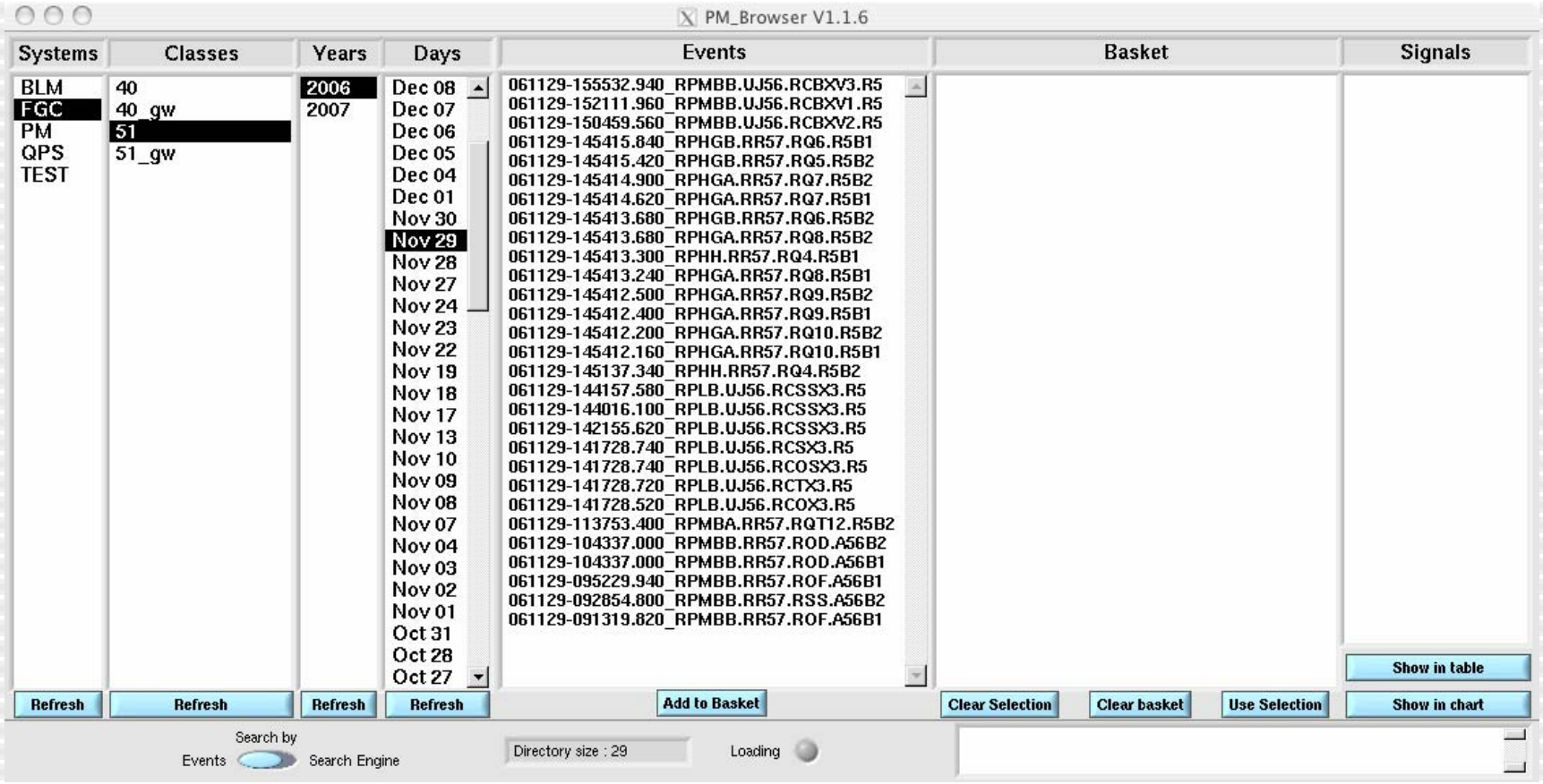


3.2 PIC Expert Analysis

The PIC expert application has been used during Dry Run in UA83

The automatic pattern recognition will be useful for the offline analysis during HWC in sector 7-8

3.3 PC Expert Analysis



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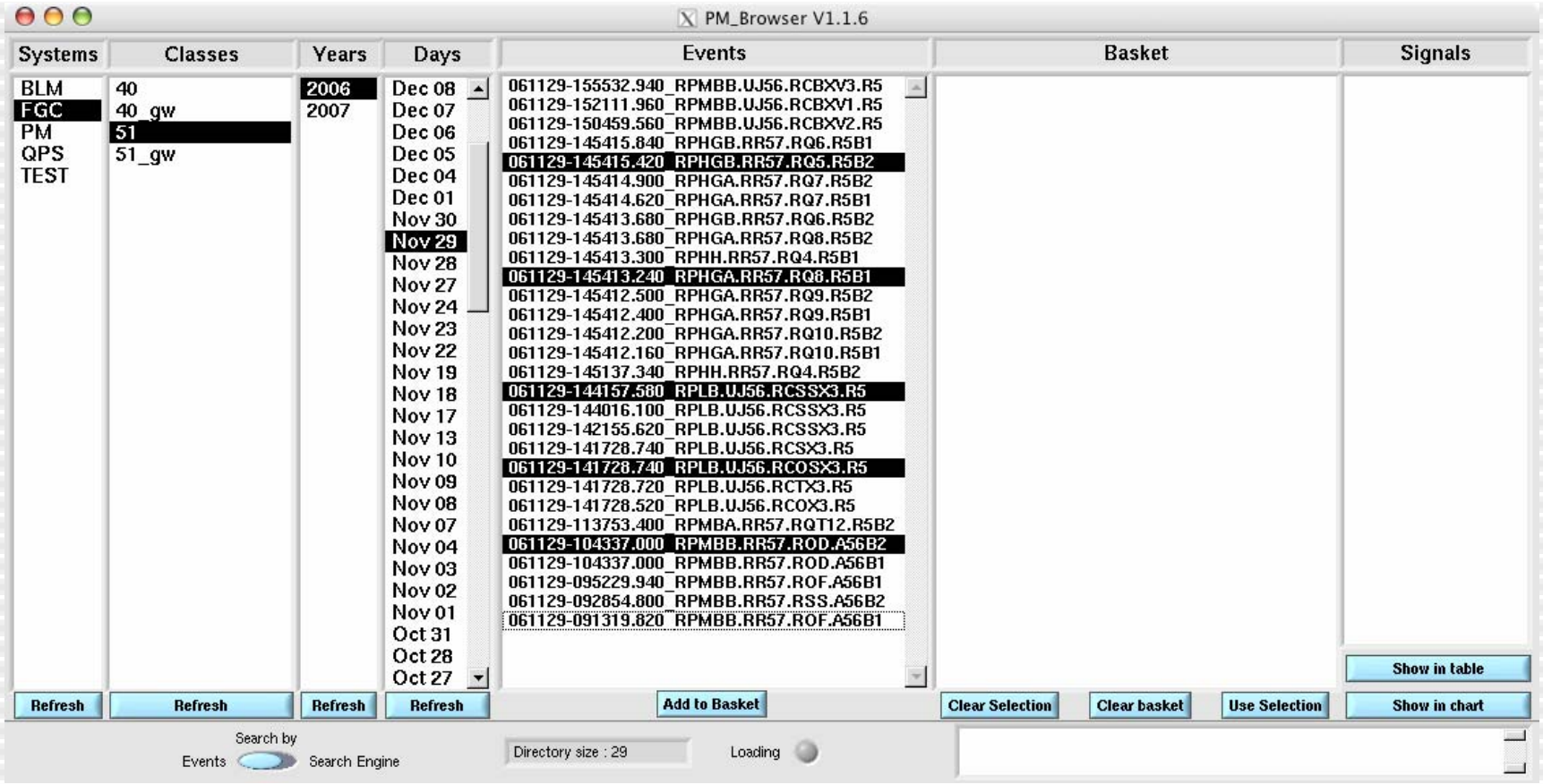

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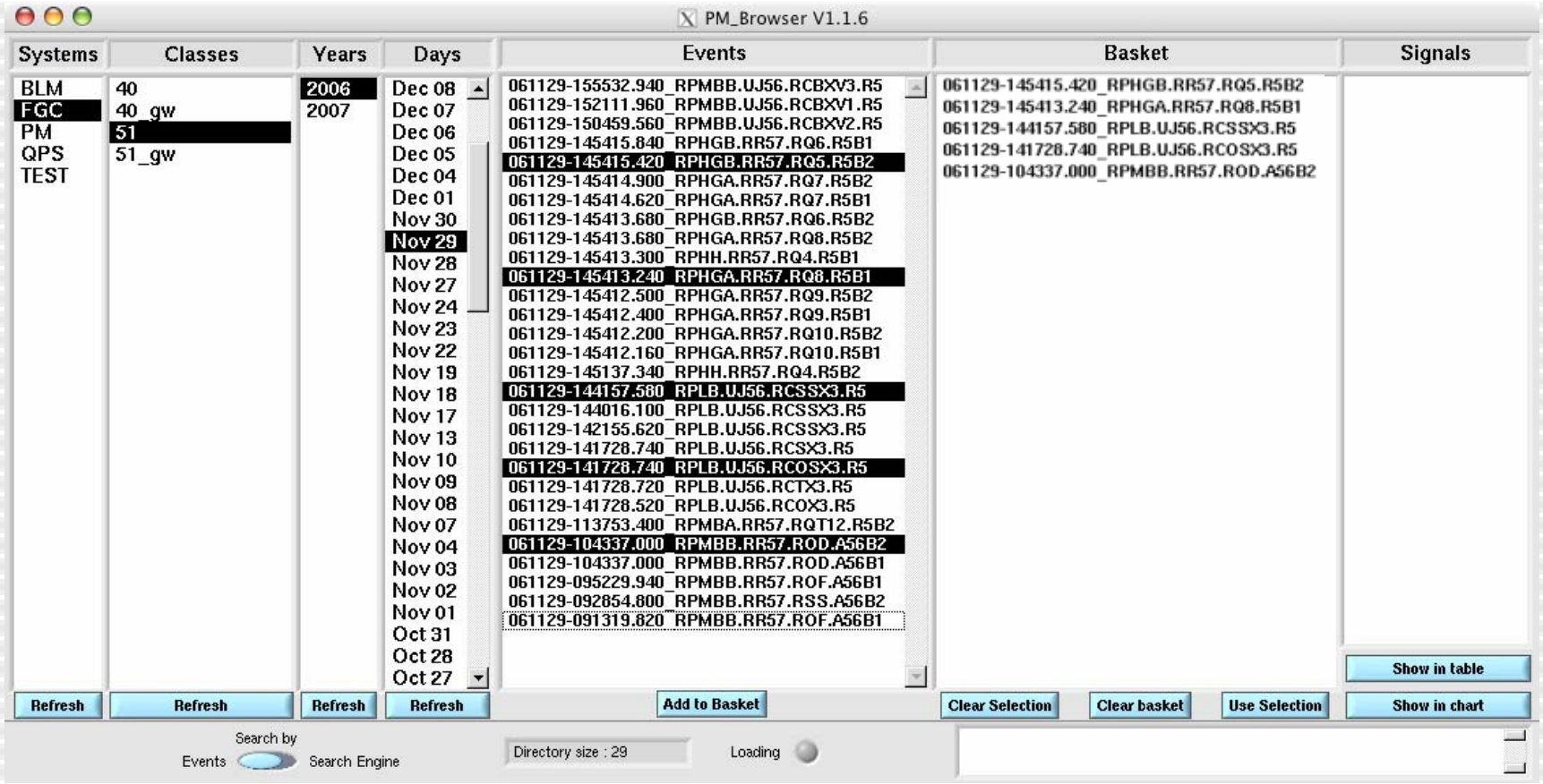

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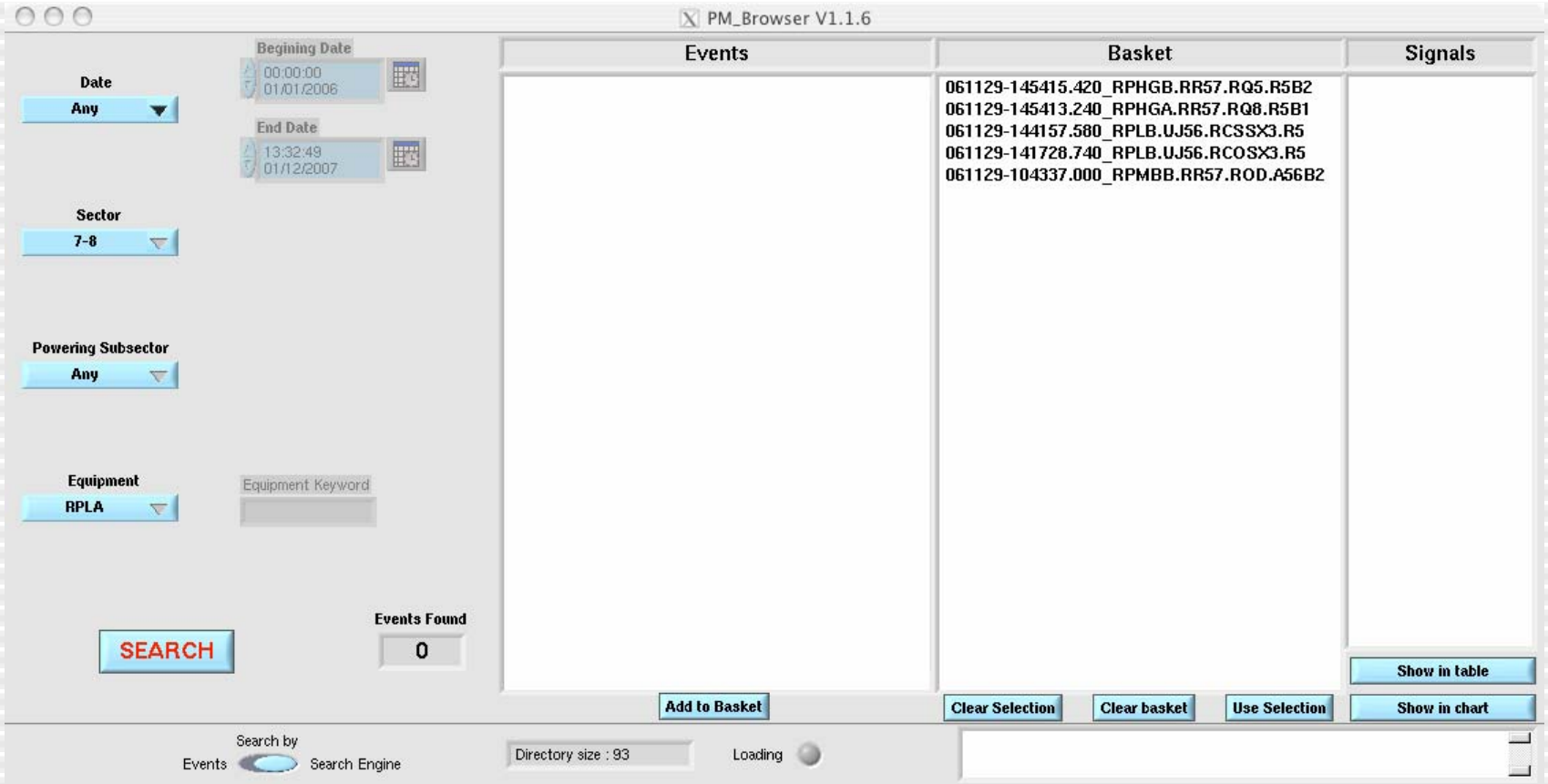

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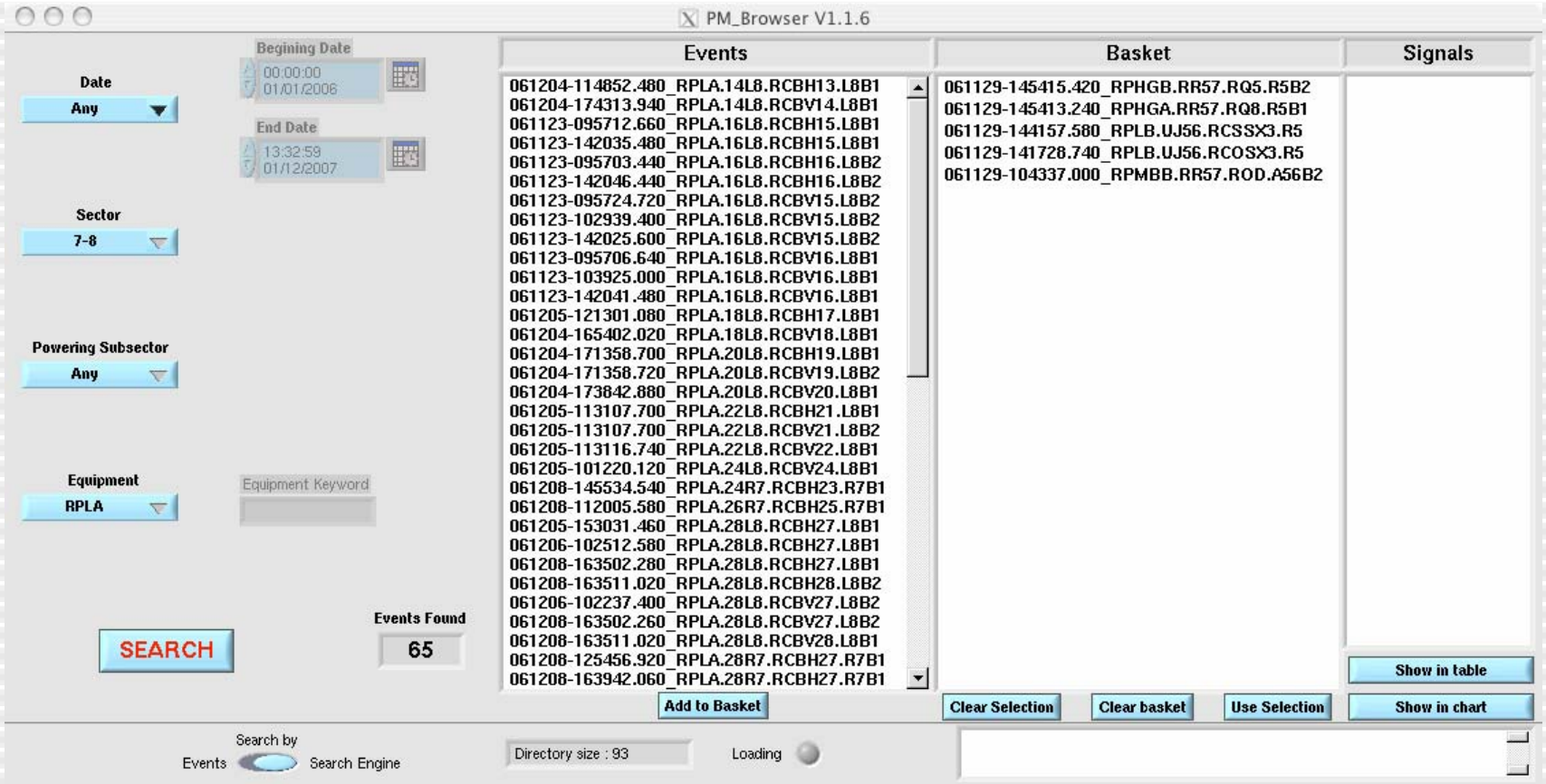

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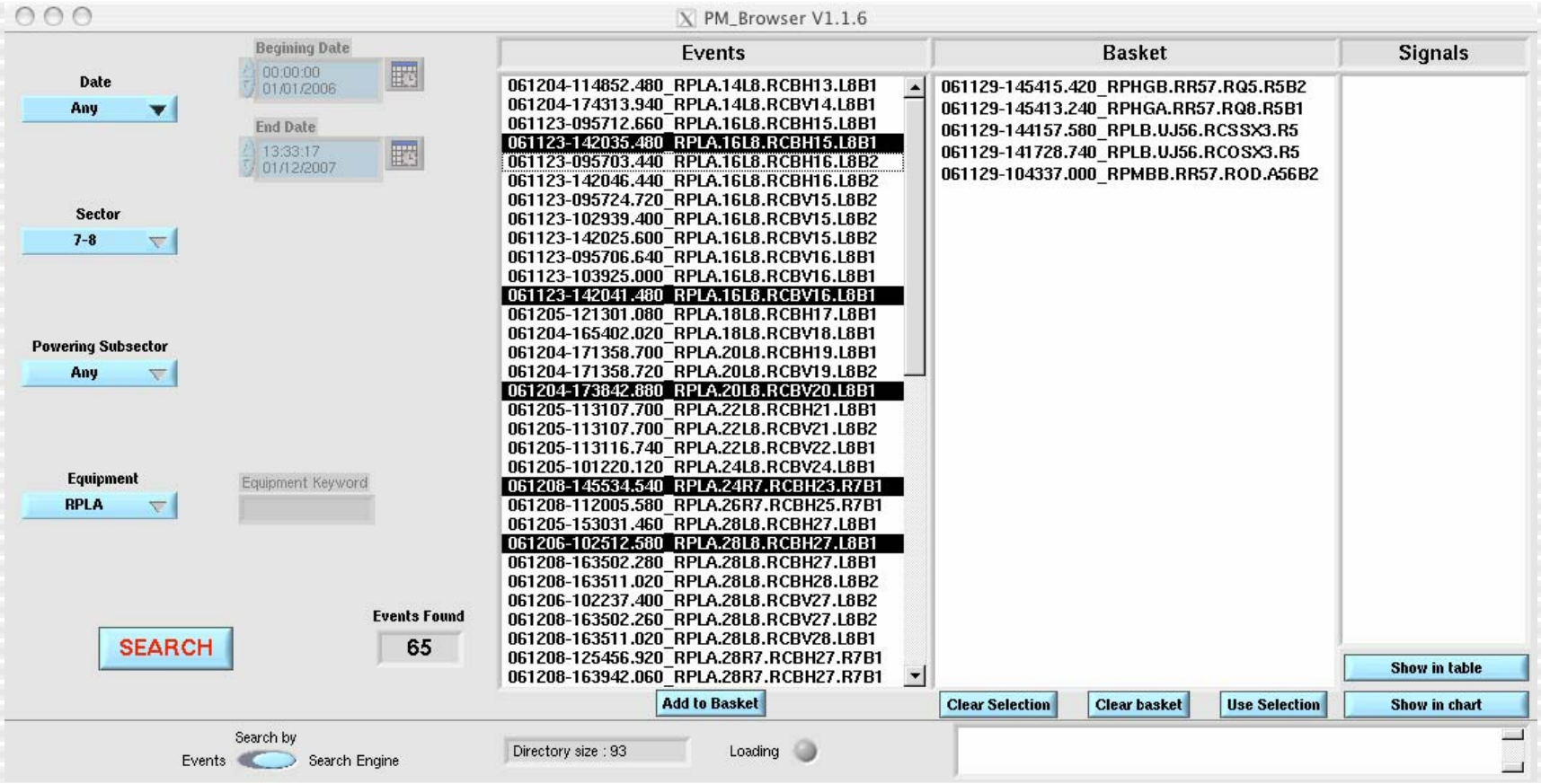

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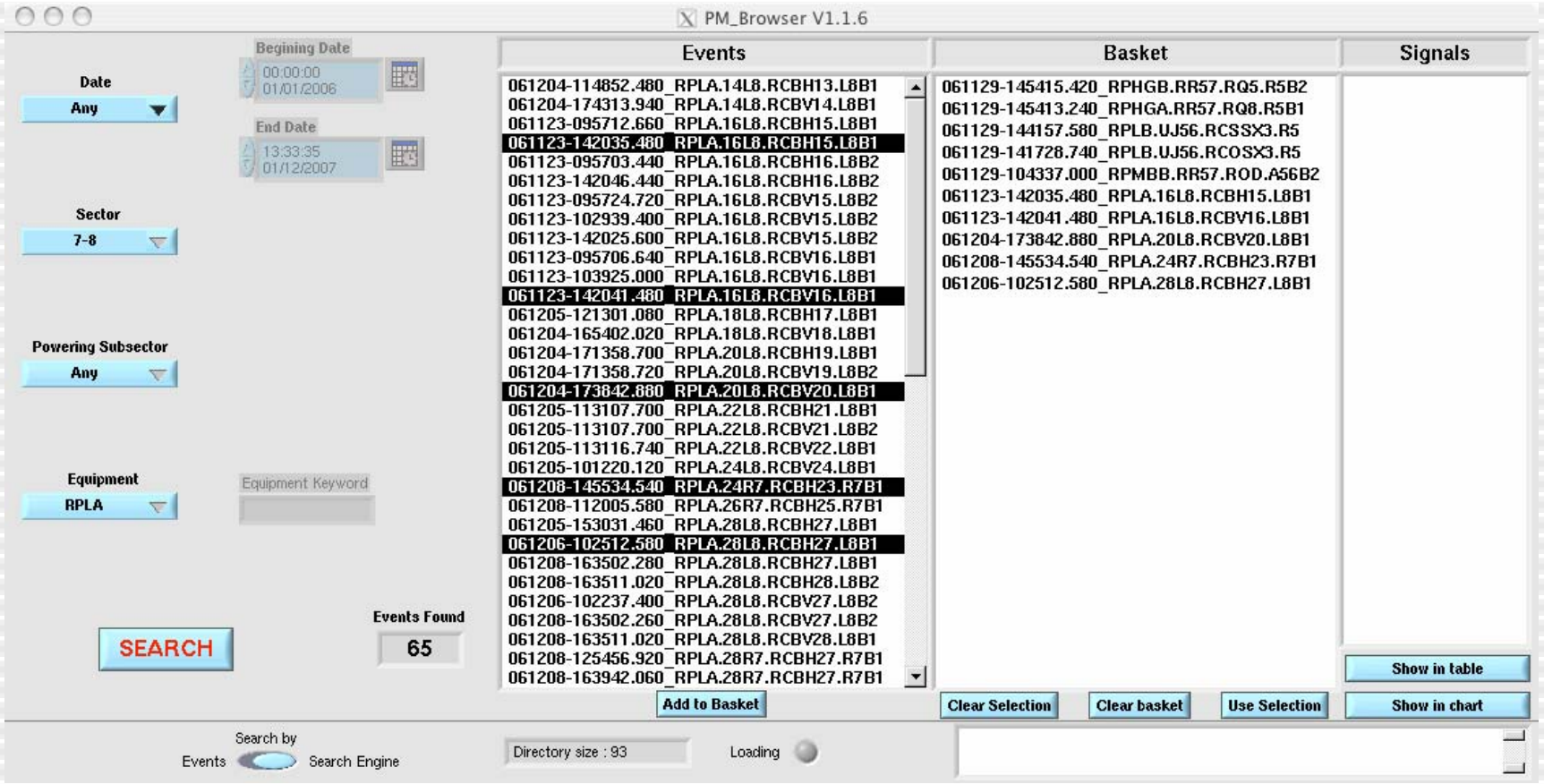

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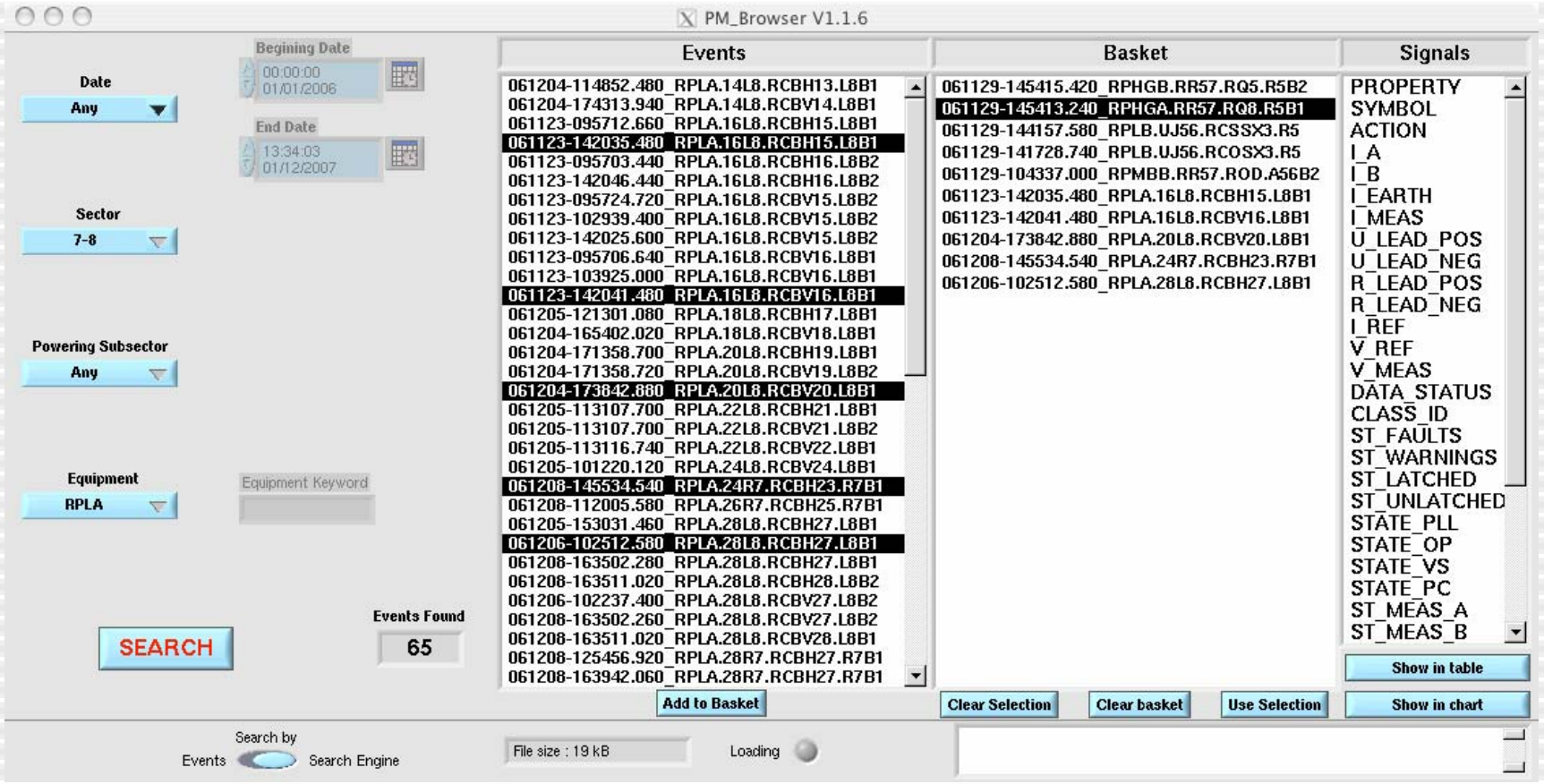

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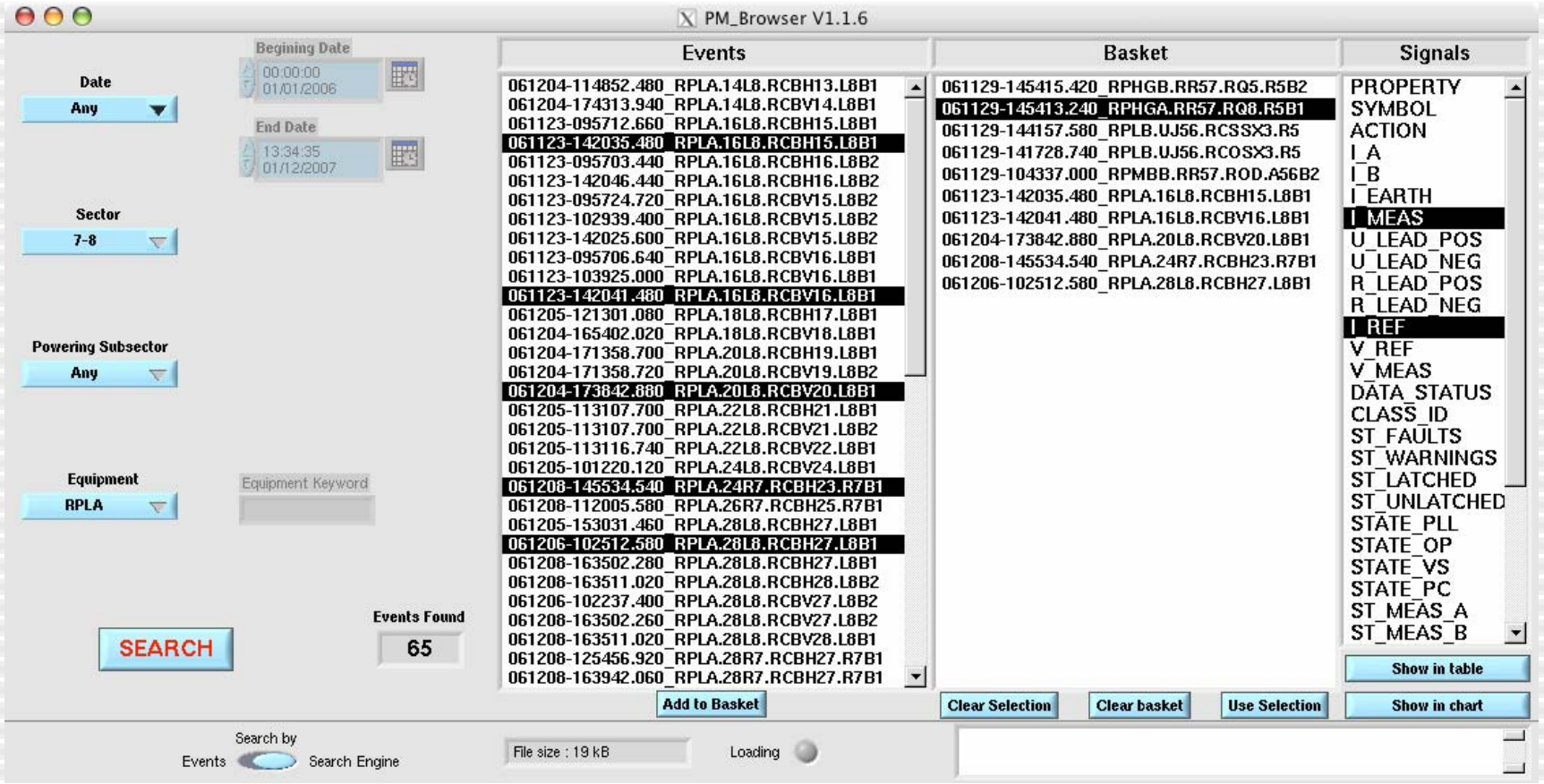

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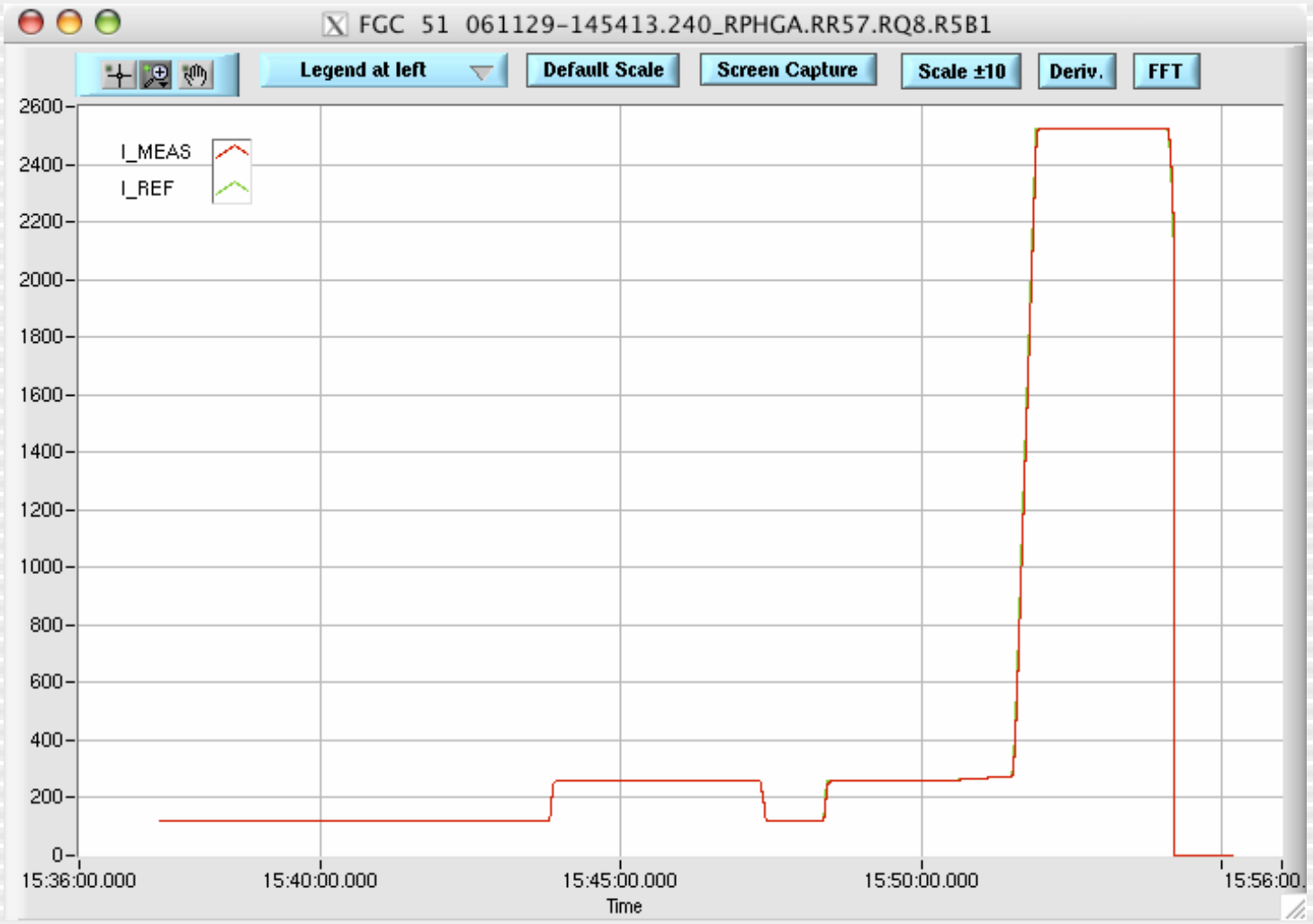

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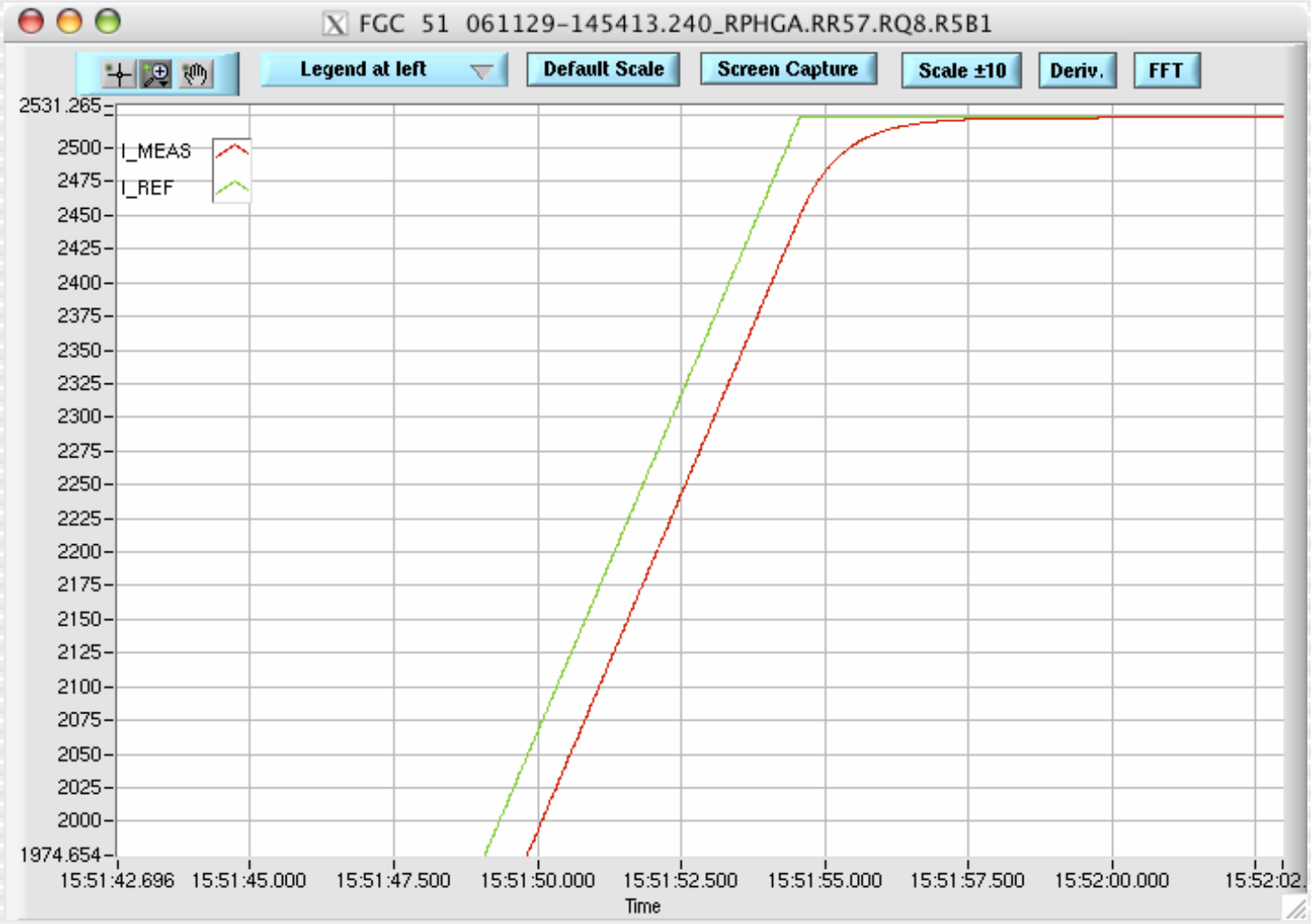

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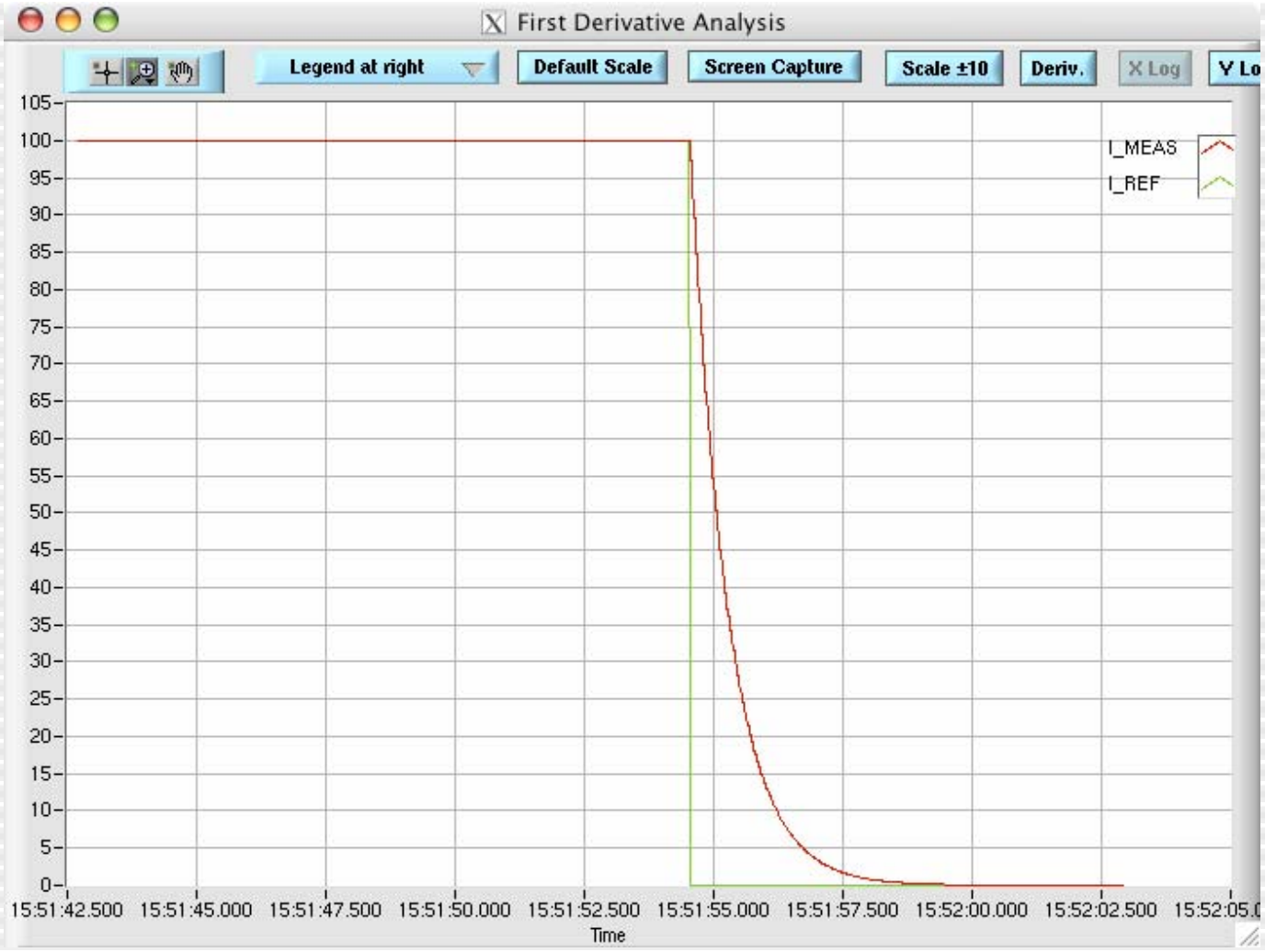

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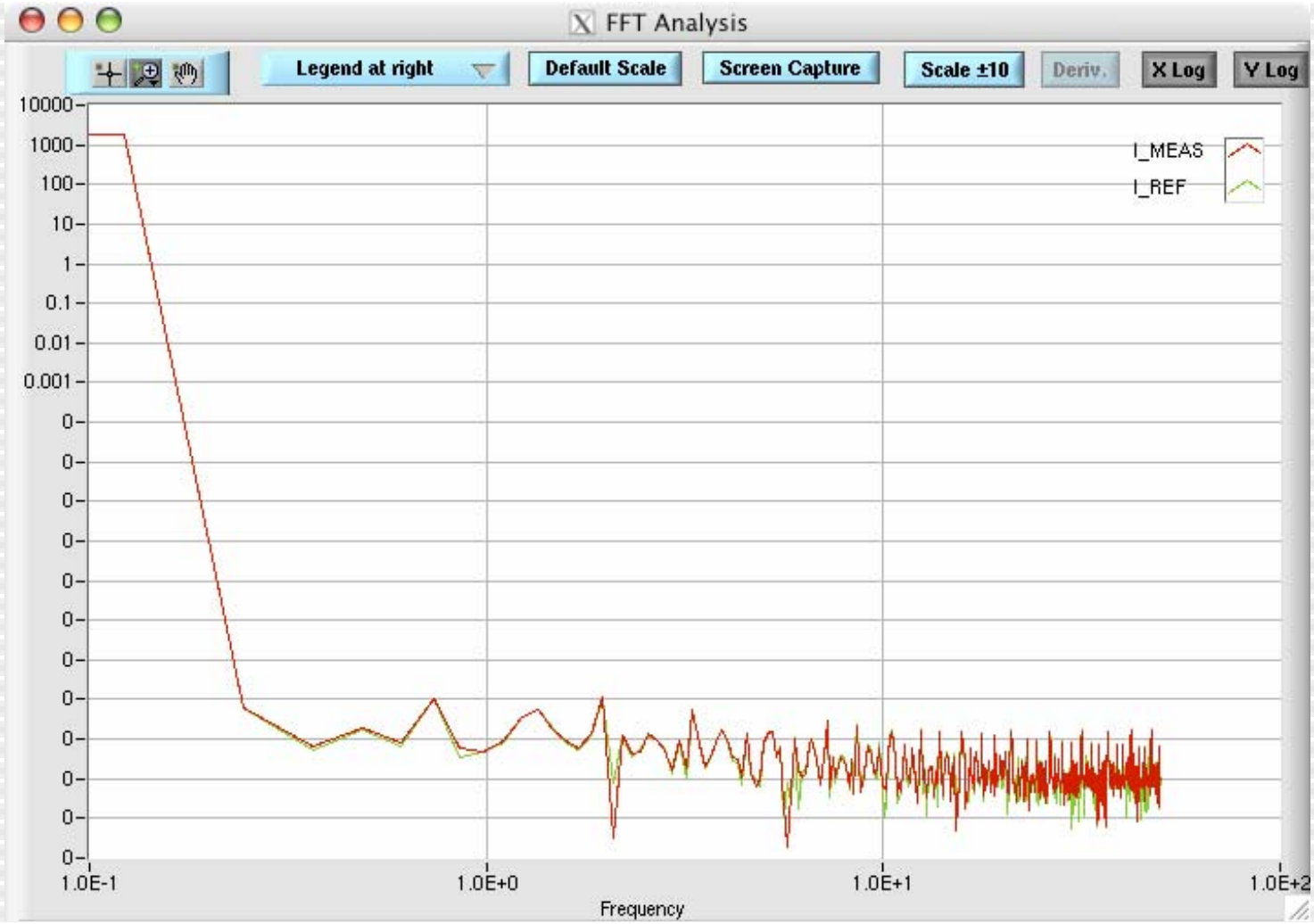

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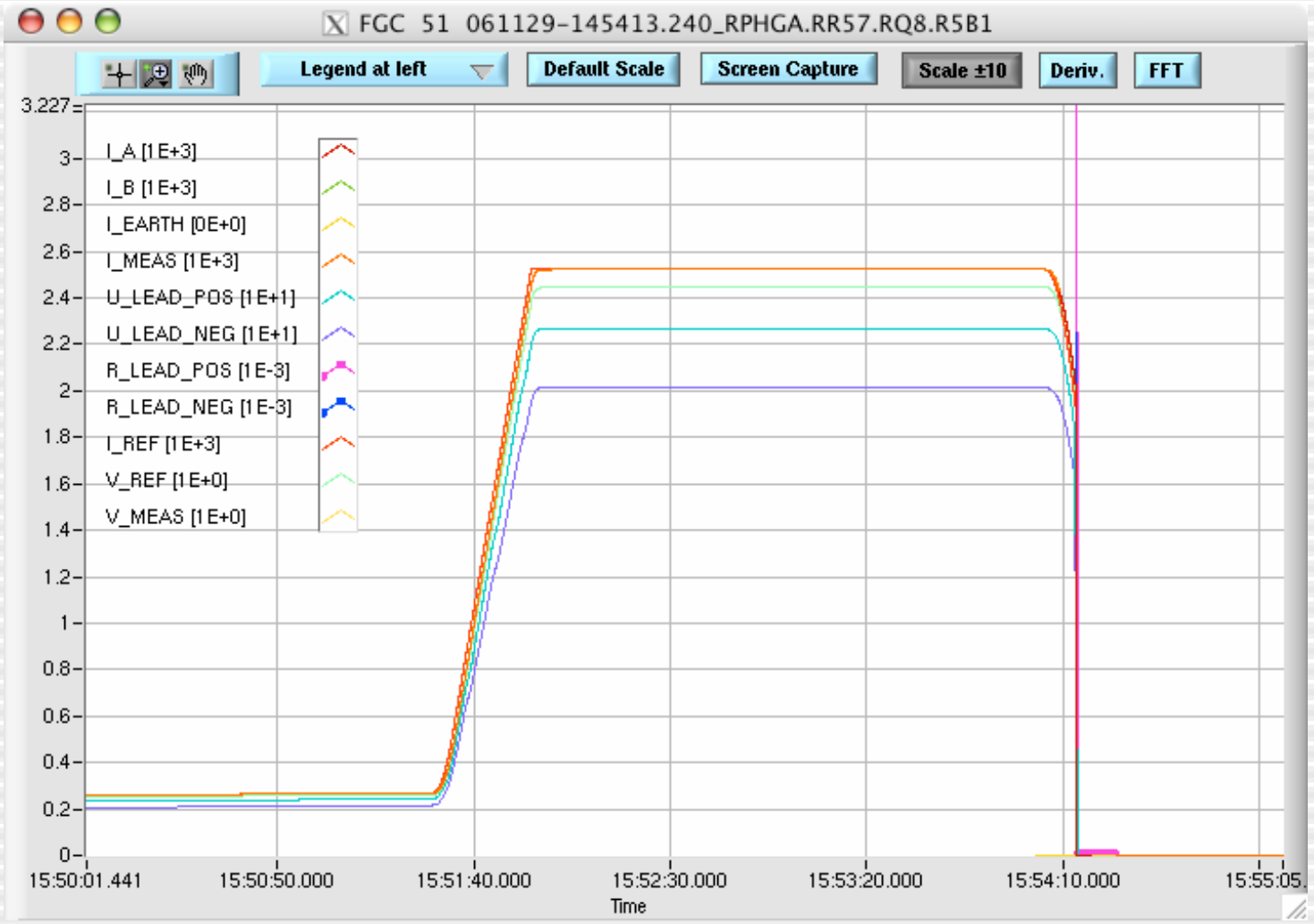

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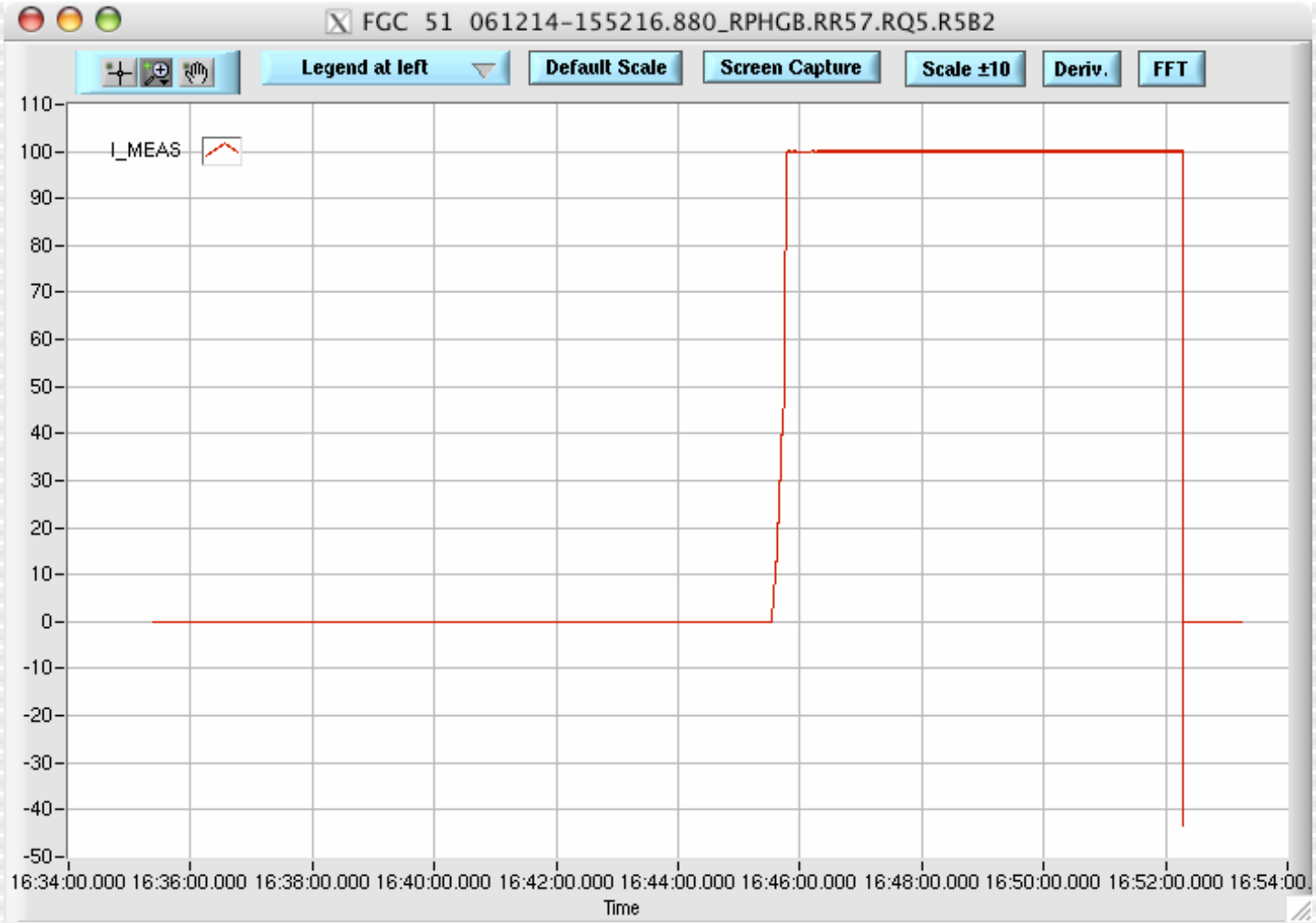

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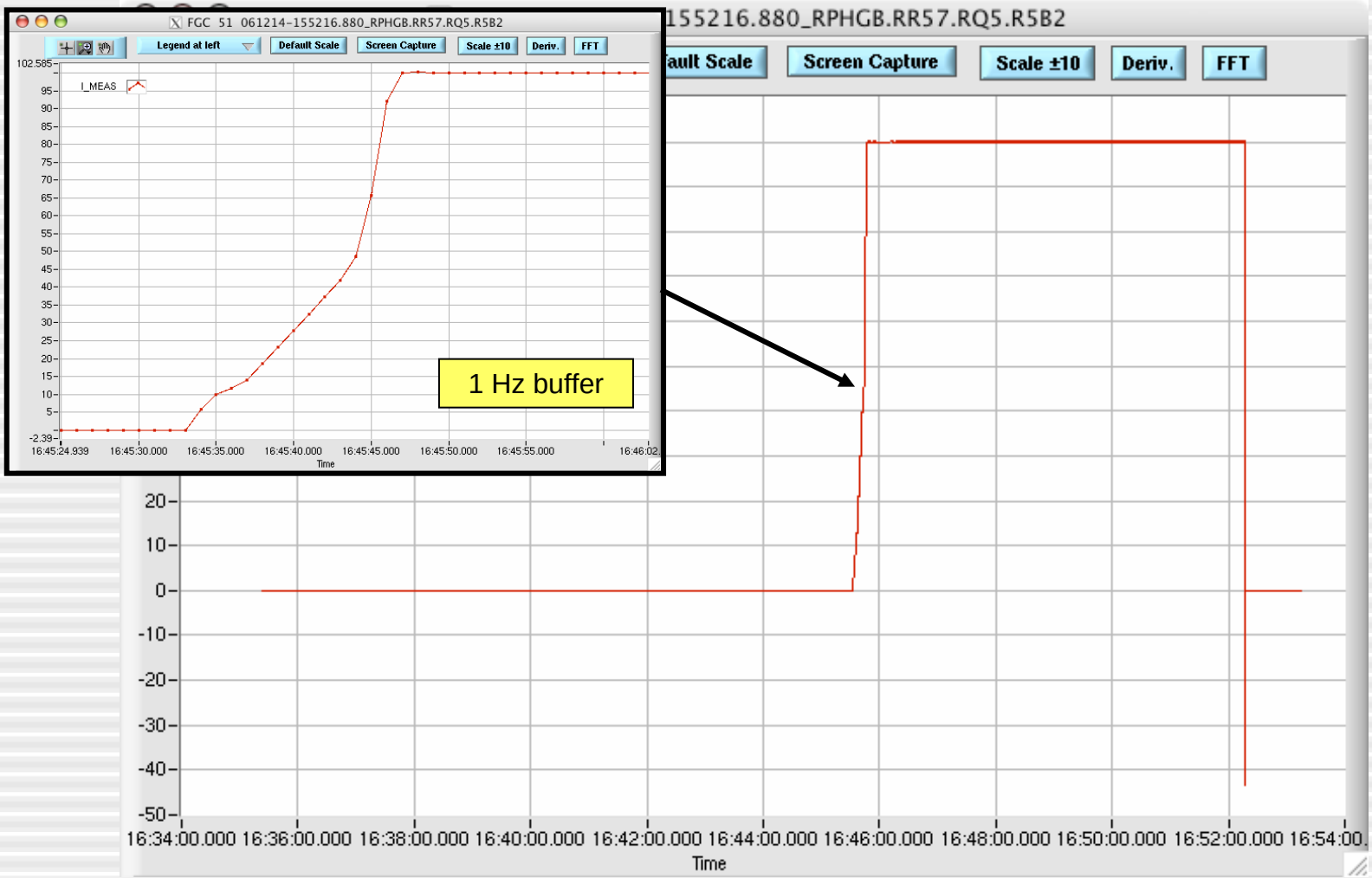

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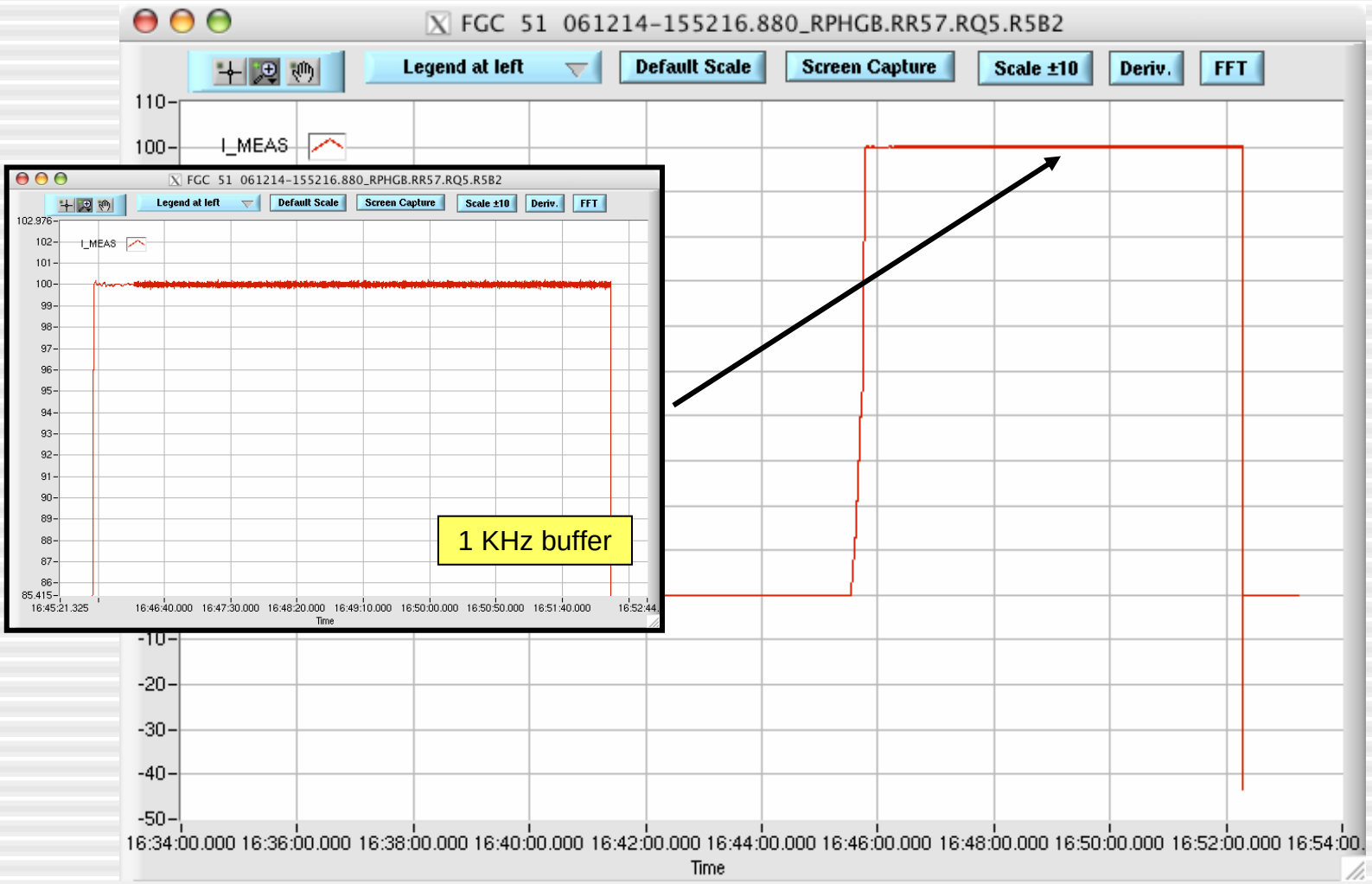

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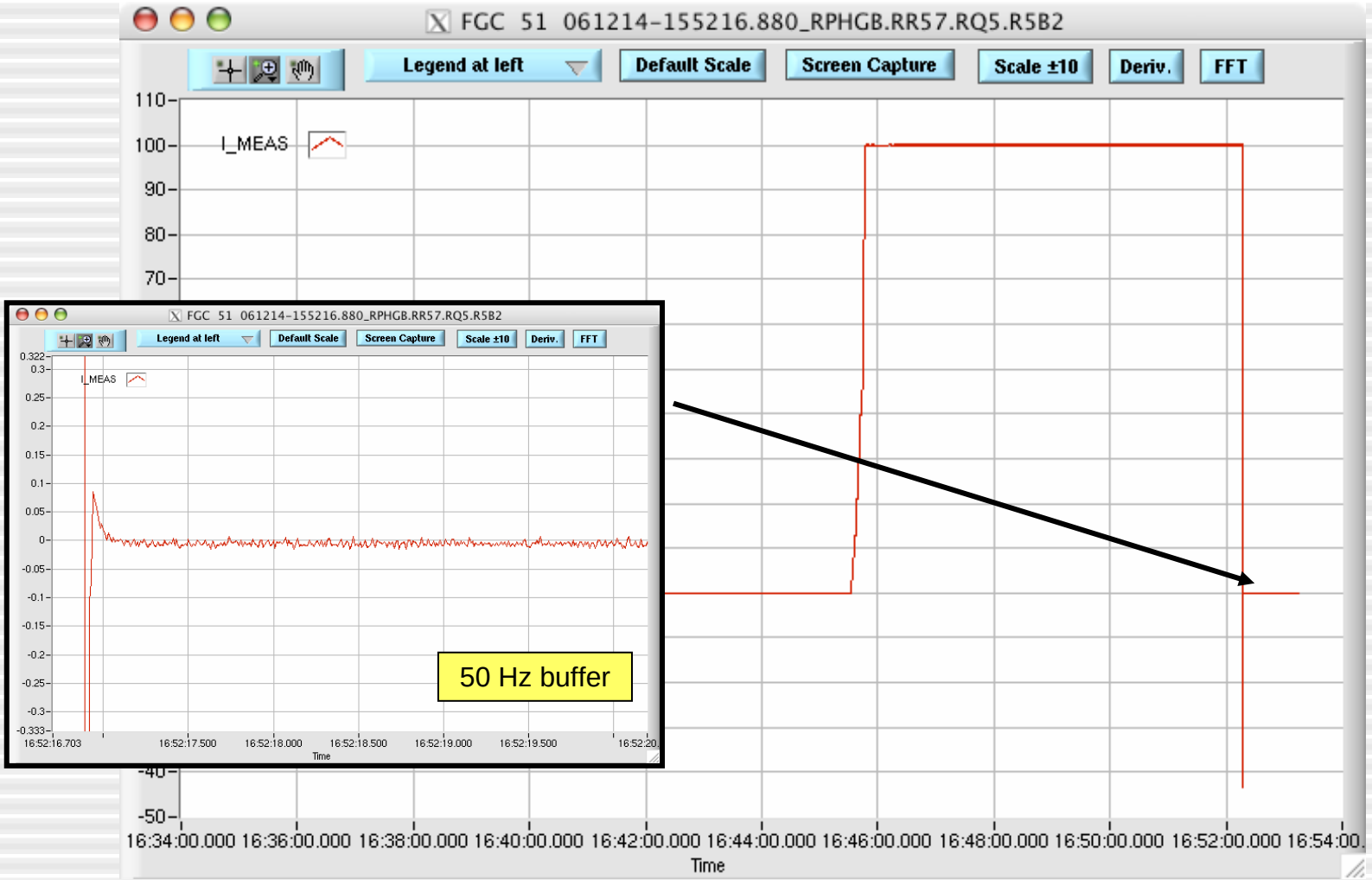

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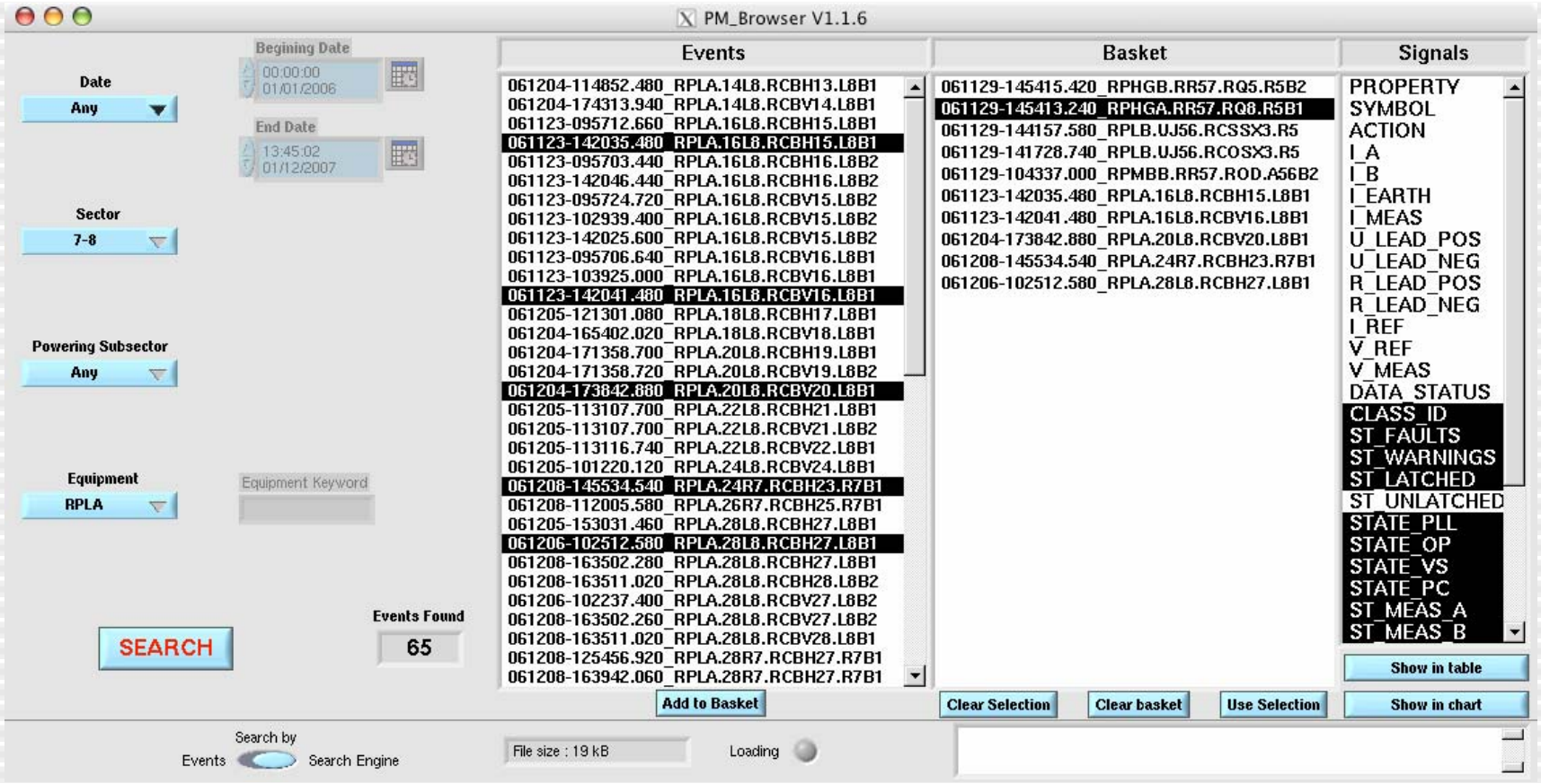


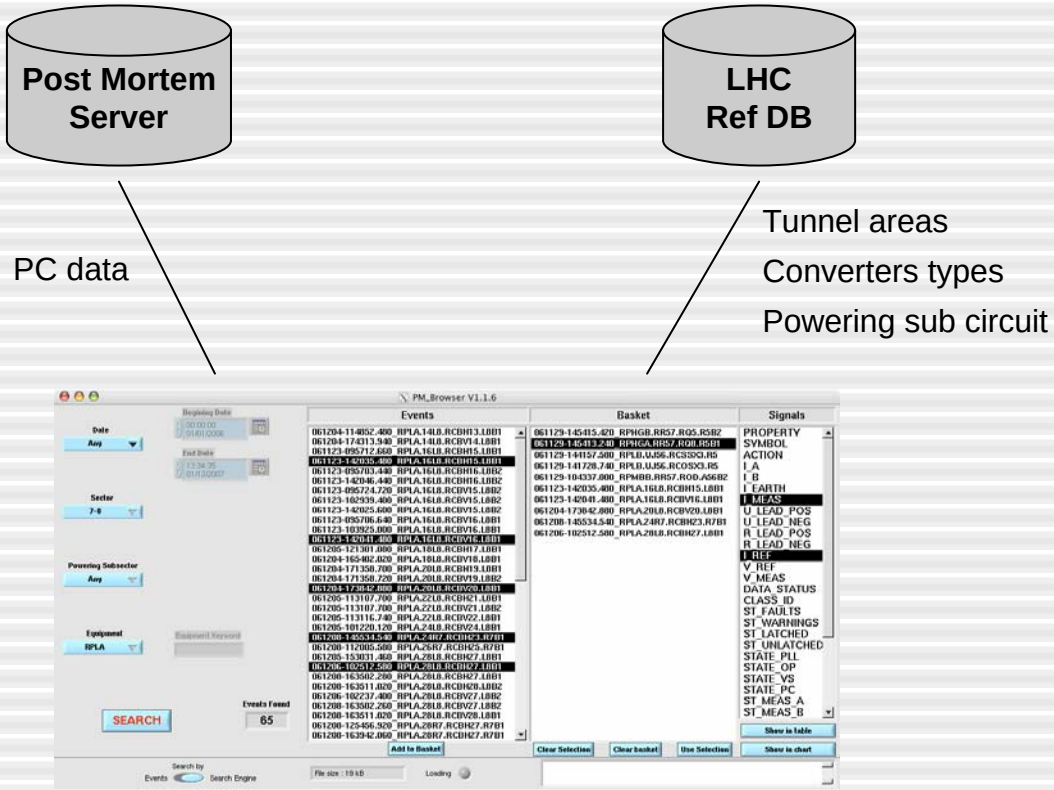
3.3 PC Expert Analysis

FGC 51 061129-145413.240_RPHGA.RR57.RQ8.R5B1

Export | Screen Capture

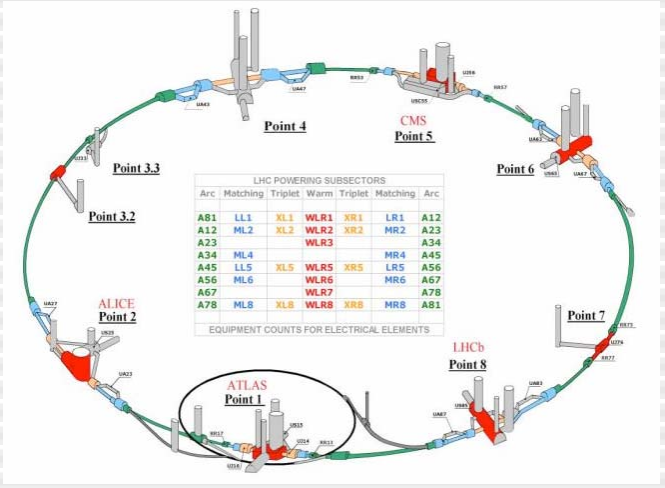
Time	CLASS_ID	ST_FAULTS	ST_WARNINGS	ST_LATCHED	STATE_PLL	STATE_OP	STATE_VS	STATE_PC	ST_MEAS_A	
2006/11/29 14:55:12 020000	51	FB_LOOP	VS_SIM		PLL_LOCKED	SIM_VS	VS_OFF	FLT_OFF	I_MEAS_OK V_MEAS_OK	I_
2006/11/29 14:55:12 040000	51	FB_LOOP	VS_SIM		PLL_LOCKED	SIM_VS	VS_OFF	FLT_OFF	I_MEAS_OK V_MEAS_OK	I_
2006/11/29 14:55:12 060000	51	FB_LOOP	VS_SIM		PLL_LOCKED	SIM_VS	VS_OFF	FLT_OFF	I_MEAS_OK V_MEAS_OK	I_
2006/11/29 14:55:12 080000	51	FB_LOOP	VS_SIM		PLL_LOCKED	SIM_VS	VS_OFF	FLT_OFF	I_MEAS_OK V_MEAS_OK	I_
2006/11/29 14:55:12 100000	51	FB_LOOP	VS_SIM		PLL_LOCKED	SIM_VS	VS_OFF	FLT_OFF	I_MEAS_OK V_MEAS_OK	I_
2006/11/29 14:55:12 120000	51	FB_LOOP	VS_SIM		PLL_LOCKED	SIM_VS	VS_OFF	FLT_OFF	I_MEAS_OK V_MEAS_OK	I_
2006/11/29 14:55:12 140000	51	FB_LOOP	VS_SIM		PLL_LOCKED	SIM_VS	VS_OFF	FLT_OFF	I_MEAS_OK V_MEAS_OK	I_
2006/11/29 14:55:12 160000	51	FB_LOOP	VS_SIM		PLL_LOCKED	SIM_VS	VS_OFF	FLT_OFF	I_MEAS_OK V_MEAS_OK	I_
2006/11/29 14:55:12 260000	51	FB_LOOP	VS_SIM		PLL_LOCKED	SIM_VS	VS_OFF	FLT_OFF	I_MEAS_OK V_MEAS_OK	I_
2006/11/29 14:55:12 280000	51	FB_LOOP	VS_SIM		PLL_LOCKED	SIM_VS	VS_OFF	FLT_OFF	I_MEAS_OK V_MEAS_OK	I_
2006/11/29 14:55:12 300000	51	FB_LOOP	VS_SIM		PLL_LOCKED	SIM_VS	VS_OFF	FLT_OFF	I_MEAS_OK V_MEAS_OK	I_
2006/11/29 14:55:12 320000	51	FB_LOOP	VS_SIM		PLL_LOCKED	SIM_VS	VS_OFF	FLT_OFF	I_MEAS_OK V_MEAS_OK	I_
2006/11/29 14:55:12 400000	51	FB_LOOP	VS_SIM		PLL_LOCKED	SIM_VS	VS_OFF	FLT_OFF	I_MEAS_OK V_MEAS_OK	I_
2006/11/29 14:55:12 420000	51	FB_LOOP	VS_SIM		PLL_LOCKED	SIM_VS	VS_OFF	FLT_OFF	I_MEAS_OK V_MEAS_OK	I_
2006/11/29 14:55:12 520000	51	FB_LOOP	VS_SIM		PLL_LOCKED	SIM_VS	VS_OFF	FLT_OFF	I_MEAS_OK V_MEAS_OK	I_
2006/11/29 14:55:12 540000	51	FB_LOOP	VS_SIM		PLL_LOCKED	SIM_VS	VS_OFF	FLT_OFF	I_MEAS_OK V_MEAS_OK	I_
2006/11/29 14:55:12 620000	51	FB_LOOP	VS_SIM		PLL_LOCKED	SIM_VS	VS_OFF	FLT_OFF	I_MEAS_OK V_MEAS_OK	I_
2006/11/29 14:55:12 640000	51	FB_LOOP	VS_SIM		PLL_LOCKED	SIM_VS	VS_OFF	FLT_OFF	I_MEAS_OK V_MEAS_OK	I_
2006/11/29 14:55:12 660000	51	FB_LOOP	VS_SIM		PLL_LOCKED	SIM_VS	VS_OFF	FLT_OFF	I_MEAS_OK V_MEAS_OK	I_
2006/11/29 14:55:12 680000	51	FB_LOOP	VS_SIM		PLL_LOCKED	SIM_VS	VS_OFF	FLT_OFF	I_MEAS_OK V_MEAS_OK	I_
2006/11/29 14:55:12 700000	51	FB_LOOP	VS_SIM		PLL_LOCKED	SIM_VS	VS_OFF	FLT_OFF	I_MEAS_OK V_MEAS_OK	I_
2006/11/29 14:55:12 720000	51	FB_LOOP	VS_SIM		PLL_LOCKED	SIM_VS	VS_OFF	FLT_OFF	I_MEAS_OK V_MEAS_OK	I_
2006/11/29 14:55:12 740000	51	FB_LOOP	VS_SIM		PLL_LOCKED	SIM_VS	VS_OFF	FLT_OFF	I_MEAS_OK V_MEAS_OK	I_
2006/11/29 14:55:12 760000	51	FB_LOOP	VS_SIM		PLL_LOCKED	SIM_VS	VS_OFF	FLT_OFF	I_MEAS_OK V_MEAS_OK	I_
2006/11/29 14:55:12 780000	51	FB_LOOP	VS_SIM		PLL_LOCKED	SIM_VS	VS_OFF	FLT_OFF	I_MEAS_OK V_MEAS_OK	I_
2006/11/29 14:55:12 800000	51	FB_LOOP	VS_SIM		PLL_LOCKED	SIM_VS	VS_OFF	FLT_OFF	I_MEAS_OK V_MEAS_OK	I_
2006/11/29 14:55:12 820000	51	FB_LOOP	VS_SIM		PLL_LOCKED	SIM_VS	VS_OFF	FLT_OFF	I_MEAS_OK V_MEAS_OK	I_
2006/11/29 14:55:12 840000	51	FB_LOOP	VS_SIM		PLL_LOCKED	SIM_VS	VS_OFF	FLT_OFF	I_MEAS_OK V_MEAS_OK	I_
2006/11/29 14:55:12 860000	51	FB_LOOP	VS_SIM		PLL_LOCKED	SIM_VS	VS_OFF	FLT_OFF	I_MEAS_OK V_MEAS_OK	I_
2006/11/29 14:55:12 880000	51	FB_LOOP	VS_SIM		PLL_LOCKED	SIM_VS	VS_OFF	FLT_OFF	I_MEAS_OK V_MEAS_OK	I_
2006/11/29 14:55:12 900000	51	FB_LOOP	VS_SIM		PLL_LOCKED	SIM_VS	VS_OFF	FLT_OFF	I_MEAS_OK V_MEAS_OK	I_
2006/11/29 14:55:12 920000	51	FB_LOOP	VS_SIM		PLL_LOCKED	SIM_VS	VS_OFF	FLT_OFF	I_MEAS_OK V_MEAS_OK	I_
2006/11/29 14:55:12 940000	51	FB_LOOP	VS_SIM		PLL_LOCKED	SIM_VS	VS_OFF	FLT_OFF	I_MEAS_OK V_MEAS_OK	I_
2006/11/29 14:55:12 960000	51	FB_LOOP	VS_SIM		PLL_LOCKED	SIM_VS	VS_OFF	FLT_OFF	I_MEAS_OK V_MEAS_OK	I_
2006/11/29 14:55:12 980000	51	FB_LOOP	VS_SIM		PLL_LOCKED	SIM_VS	VS_OFF	FLT_OFF	I_MEAS_OK V_MEAS_OK	I_
2006/11/29 14:55:13 000000	51	FB_LOOP	VS_SIM		PLL_LOCKED	SIM_VS	VS_OFF	FLT_OFF	I_MEAS_OK V_MEAS_OK	I_
2006/11/29 14:55:13 020000	51	FB_LOOP	VS_SIM		PLL_LOCKED	SIM_VS	VS_OFF	FLT_OFF	I_MEAS_OK V_MEAS_OK	I_
2006/11/29 14:55:13 040000	51	FB_LOOP	VS_SIM		PLL_LOCKED	SIM_VS	VS_OFF	FLT_OFF	I_MEAS_OK V_MEAS_OK	I_
2006/11/29 14:55:13 060000	51	FB_LOOP	VS_SIM		PLL_LOCKED	SIM_VS	VS_OFF	FLT_OFF	I_MEAS_OK V_MEAS_OK	I_
2006/11/29 14:55:13 080000	51	FB_LOOP	VS_SIM		PLL_LOCKED	SIM_VS	VS_OFF	FLT_OFF	I_MEAS_OK V_MEAS_OK	I_
2006/11/29 14:55:13 100000	51	FB_LOOP	VS_SIM		PLL_LOCKED	SIM_VS	VS_OFF	FLT_OFF	I_MEAS_OK V_MEAS_OK	I_
2006/11/29 14:55:13 120000	51	FB_LOOP	VS_SIM		PLL_LOCKED	SIM_VS	VS_OFF	FLT_OFF	I_MEAS_OK V_MEAS_OK	I_
2006/11/29 14:55:13 140000	51	FB_LOOP	VS_SIM		PLL_LOCKED	SIM_VS	VS_OFF	FLT_OFF	I_MEAS_OK V_MEAS_OK	I_
2006/11/29 14:55:13 160000	51	FB_LOOP	VS_SIM		PLL_LOCKED	SIM_VS	VS_OFF	FLT_OFF	I_MEAS_OK V_MEAS_OK	I_
2006/11/29 14:55:13 180000	51	FB_LOOP	VS_SIM		PLL_LOCKED	SIM_VS	VS_OFF	FLT_OFF	I_MEAS_OK V_MEAS_OK	I_
2006/11/29 14:55:13 200000	51	FB_LOOP	VS_SIM		PLL_LOCKED	SIM_VS	VS_OFF	FLT_OFF	I_MEAS_OK V_MEAS_OK	I_
2006/11/29 14:55:13 220000	51	FB_LOOP	VS_SIM		PLL_LOCKED	SIM_VS	VS_OFF	FLT_OFF	I_MEAS_OK V_MEAS_OK	I_
2006/11/29 14:55:13 240000	51	FB_LOOP	VS_SIM		PLL_LOCKED	SIM_VS	VS_OFF	FLT_OFF	I_MEAS_OK V_MEAS_OK	I_

3.3 PC Expert Analysis



3.3 PC Expert Analysis

The PC expert application is used for the HWC of the Power Converters



4. Status of the applications

4. Status of the applications

- The communication method between PMAA & the new LHC-SEQUENCER has to be changed with CMW subscribe

- Several parameters are still missing in the AA
(i.e. limits, delay between signals, ranges …)

- Specific views must be integrated to help experts during HWC
(i.e. logical signals for PC, …)

5. Conclusions

5. Conclusions

- Analysis blocs can be easily re-used for new clients

- Existing browsing structure can be adapted to new requests

- Merge of the browsing or extraction tools for all clients could be possible

- We are open to all the specifications