FLASH Magnet PS DDD Panel with TINE Multichannel Polling (03.09.10 S. Herb)

System:

82 Magnet PS with CANbus Readout, 2 PC104 Servers

181 PS with Sedac Readout, 8 TINE Servers on SUN (single process)

Problems (FLASH 2010 startup):

1 DDD Panel polling 4 properties => **724** Contracts/Sun, **164**/PC104

(total 'communication links' ~ 3000 on Sun, 700/PC104)

+ high rate of synchronous 'execute' read calls (e.g. from Sequencer)

CPU ~ k * (#contracts * exec call rate) => Server **CPU loads > 90%**

Solution (new TINE features):

-'Express' handling for exec calls (server doesn't traverse contract list)

- New API converts read exec to polling calls (used by Sequencer, MatLab?)

- Single Device polling calls are converted to **Multichannel Contracts**

--- new APIs support definition of custom 'multi-channel groups'

=> '**Impedance Mismatch**' seems to have been solved (XFEL !)

Multi-channel Server API Calls (C version)

- **Properties are specified as Multichannel**

RegisterPropertyInformation(“eqmx”,”lstwert”,…,atype,”desc”,…)

(atype = AT_SINGLE | AT_CHANNEL)

- **Groups can be explicitly defined on server as devices**

RegisterDeviceName(“eqmx”,”device1”,1); …
RegisterDeviceName(“eqmx”,”device10”,10);
RegisterDeviceName(“eqmx”,”DevGroup”,11);

- Single devices are then registered as group members

RegisterMultiChannelGroupDevice(“eqmx”,”DevGroup”,”device1”,0,10)
RegisterMultiChannelGroupDevice(“eqmx”,”DevGroup”,”device2”,1,10) …

+ response for **DevGroup/lstwert** must be explicitly coded in the server

⇒ **Client single device calls automatically converted to Group Contract !**

Poll device1/lstwert, device2/lstwert, device3/lstwert …

=> Poll DevGroup/lstwert returns array of 10 values

(client learns during contract set-up negotiations that device1 is element 0 of DevGroup, device 2 is element 1, …)

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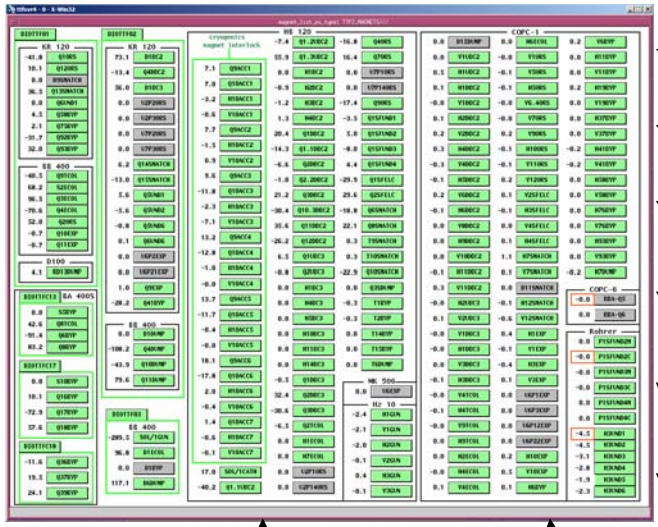
10 connections/property

(was ~260)



STEERER/SHGROUP (57)

STEERER/SVGROUP (48)

QUAD/QDGROUP (40)

DIPOLE/DIGROUP (19)

UNDULATOR/UNGROUP (7)

MAIN/MNGROUP (6)

SEXT/SXGROUP (3)

SOL/1GUN (1)

TTMAG-AB/GROUP

(PC104, 41 elements)

TTMAG-CD/GROUP

(PC104, 41 elements)

SUN (multi-server)