channels to promptly act in case of major problem and bring the detector in a safe condition. Indeed each High Voltage (HV) channel has an absolute (hardware) over-current and over-voltage protection that automatically trips the voltage if any of these parameters exceed the limits. The HV current trip limit is programmable and is usually set to a value lower than the hardware protection. As for the HV, each LV channel contains a hardware protection for the analog and digital voltages and currents at the output of the LV module, tripping the channels in case of the this alarm condition, according to the programmable trip time selected. The other controls are performed at the software level by the back-end applications. The communication with the CAEN power system is managed by the Mainframe SY1527 through the OPC protocol [36], following the schema in Figure 3.8. The software applications based on PVSS are distributed over four servers for resources optimization and loads balancing. The acquisition is based on an event-driven approach and the most significant parameters are handled with a 2 s refresh time.

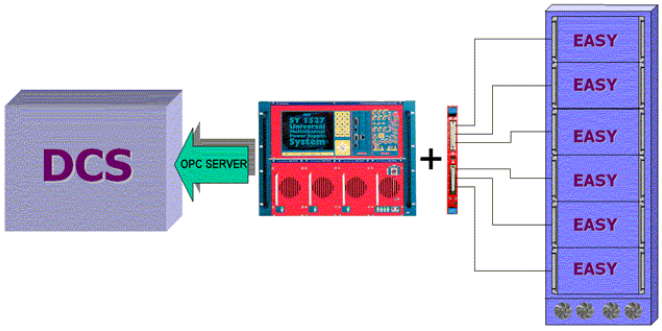

Figure 3.8. The CAEN mainframe can operate independently the power channels and it communicates with the DCS via OPC. The DCS monitors the system status and sends commands to the Mainframe.

The software part is aimed to enhance the hardware level protection by mean of several slower safety checks on each channel, and to provide an easy and robust interface to operate the system. Additional control on the values set, the incoming alarm conditions and the equipment status are performed in order to prevent harmful situations for the hardware. Programmable actions are foreseen to switch off the LV and HV boards or gently rump down the voltages to safer status conditions in case of high working temperature or failure of the auxiliary systems. The DCS is also the interface between the power supply channels and the higher levels of the control system. It handles multiple commands from the supervisory DCS application, translates those into the right sequences of single com-