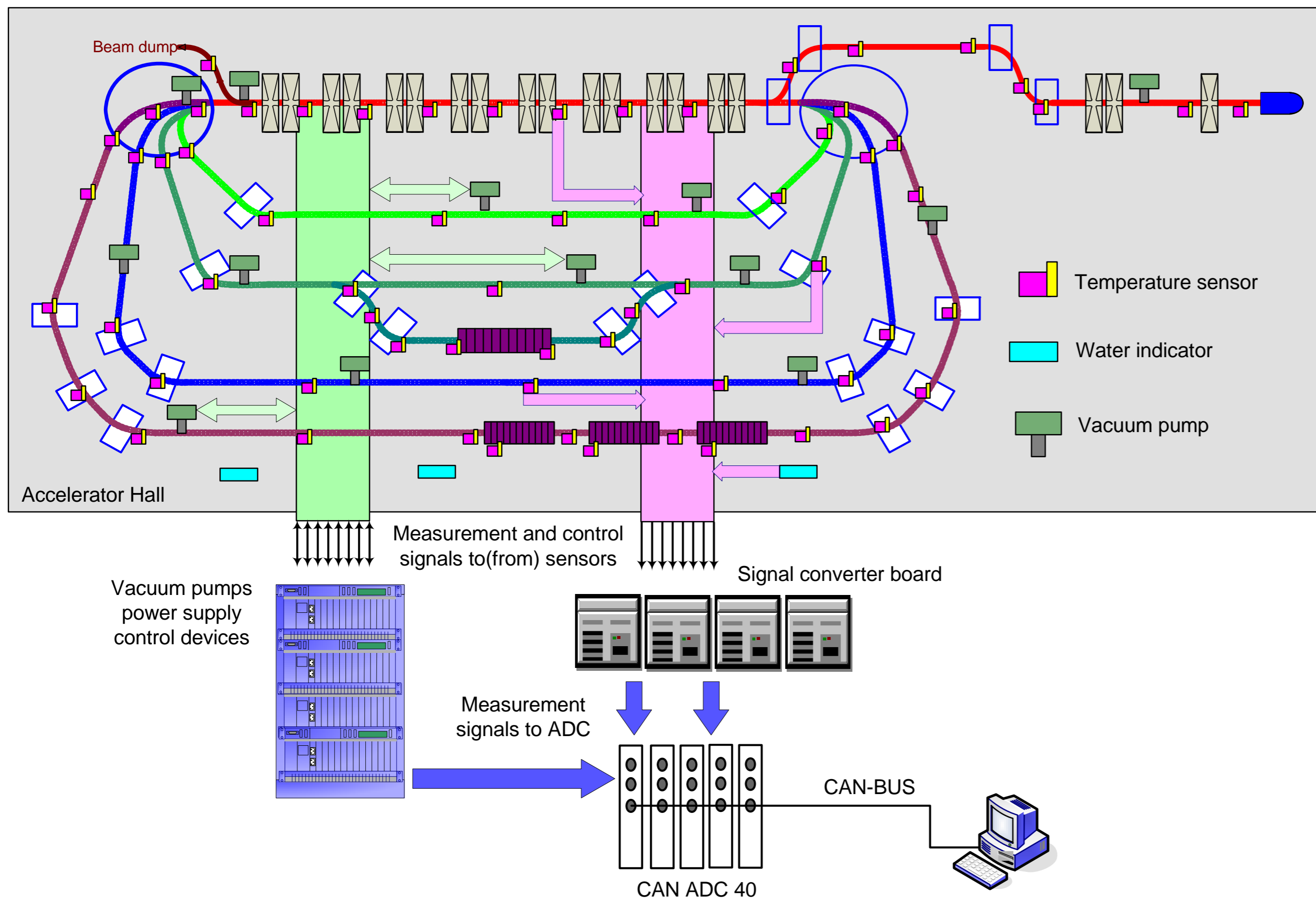


TEMPERATURE MEASUREMENT SYSTEM OF NOVOSIBIRSK FREE ELECTRON LASER

B.A.Gudkov, P.A.Selivanov, V.R.Kozak, E.A.Kuper, S.S.Serednyakov, S.V.Tararyshkin
BINP SB RAS, Novosibirsk, Russia

Scheme of main connections of the system



The main types of the sensors

1. Temperature sensors.

$$T = A * U + B$$

2. Vacuum sensors.

$$I = A * e^{B * U + C}$$

3. Water indicator.

$$Water = if(U > U_0)$$

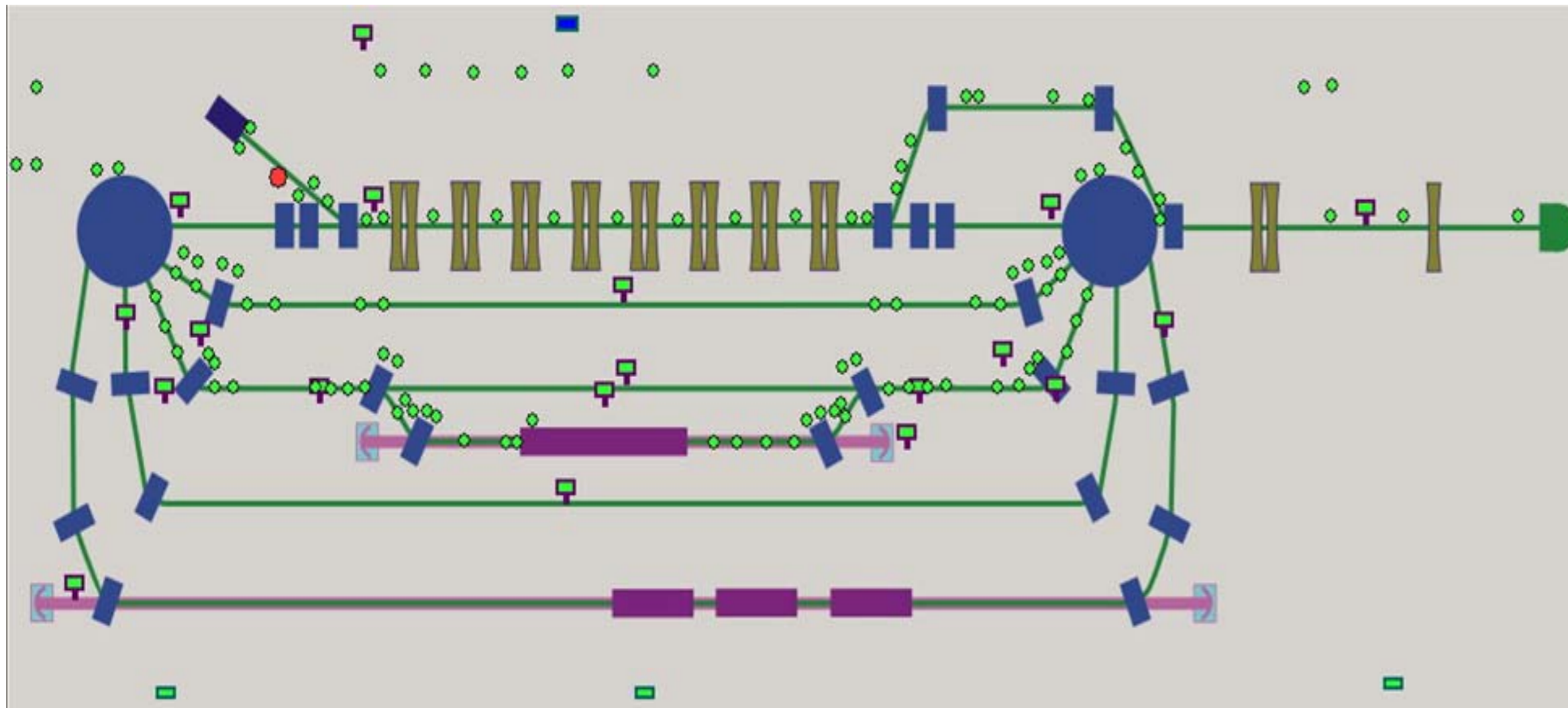
Output voltages of all sensors are measured by CANADC40 device (40-channel ADC with CANbus interface)

The number of sensors of different types, used in 1st, 2nd, 3rd FEL stages

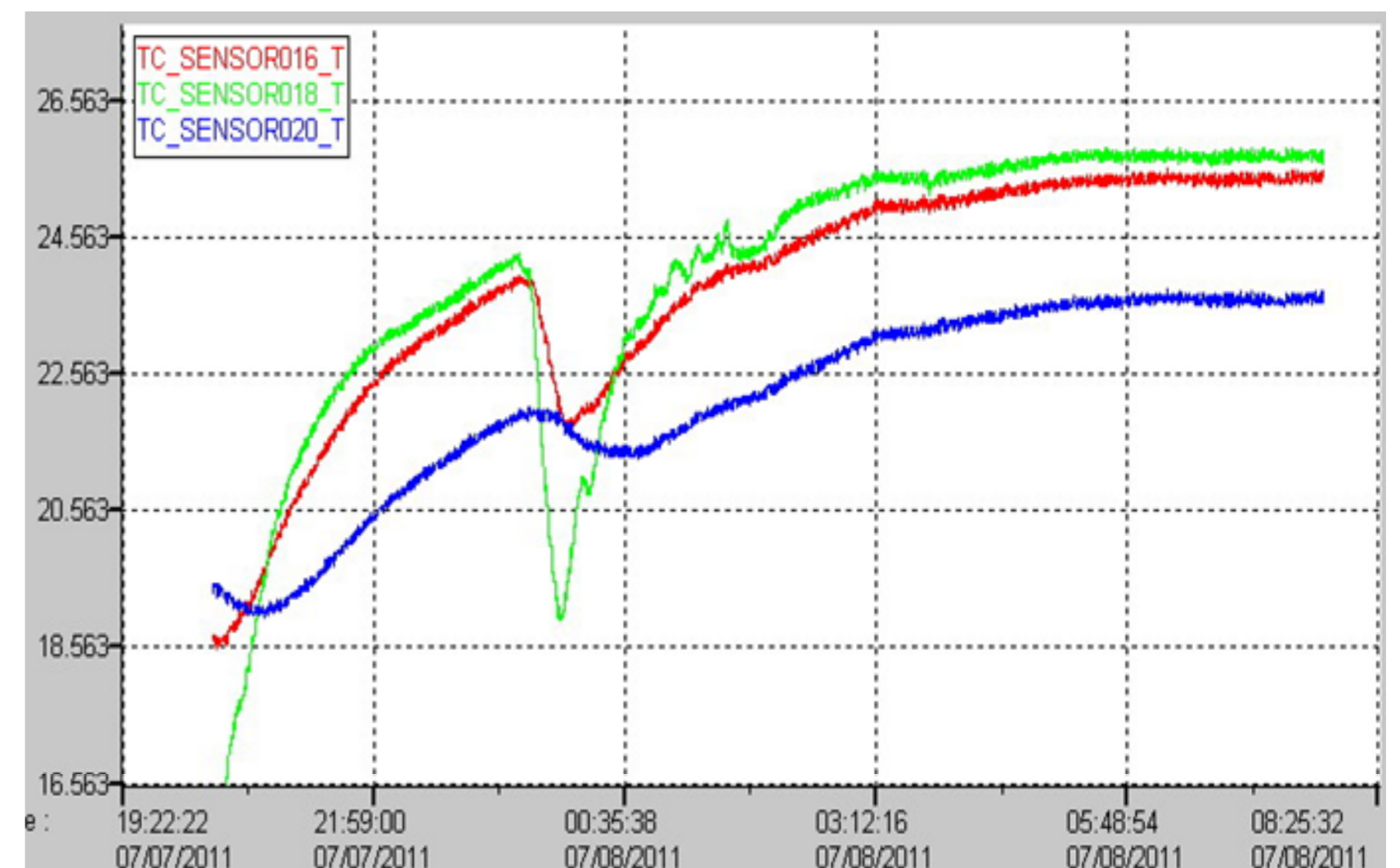
Sensor type	FEL Stage		
	1st	2nd	3rd
Temperature	98	112	165
Water	3	3	3
Vacuum	14	19	25

Control software

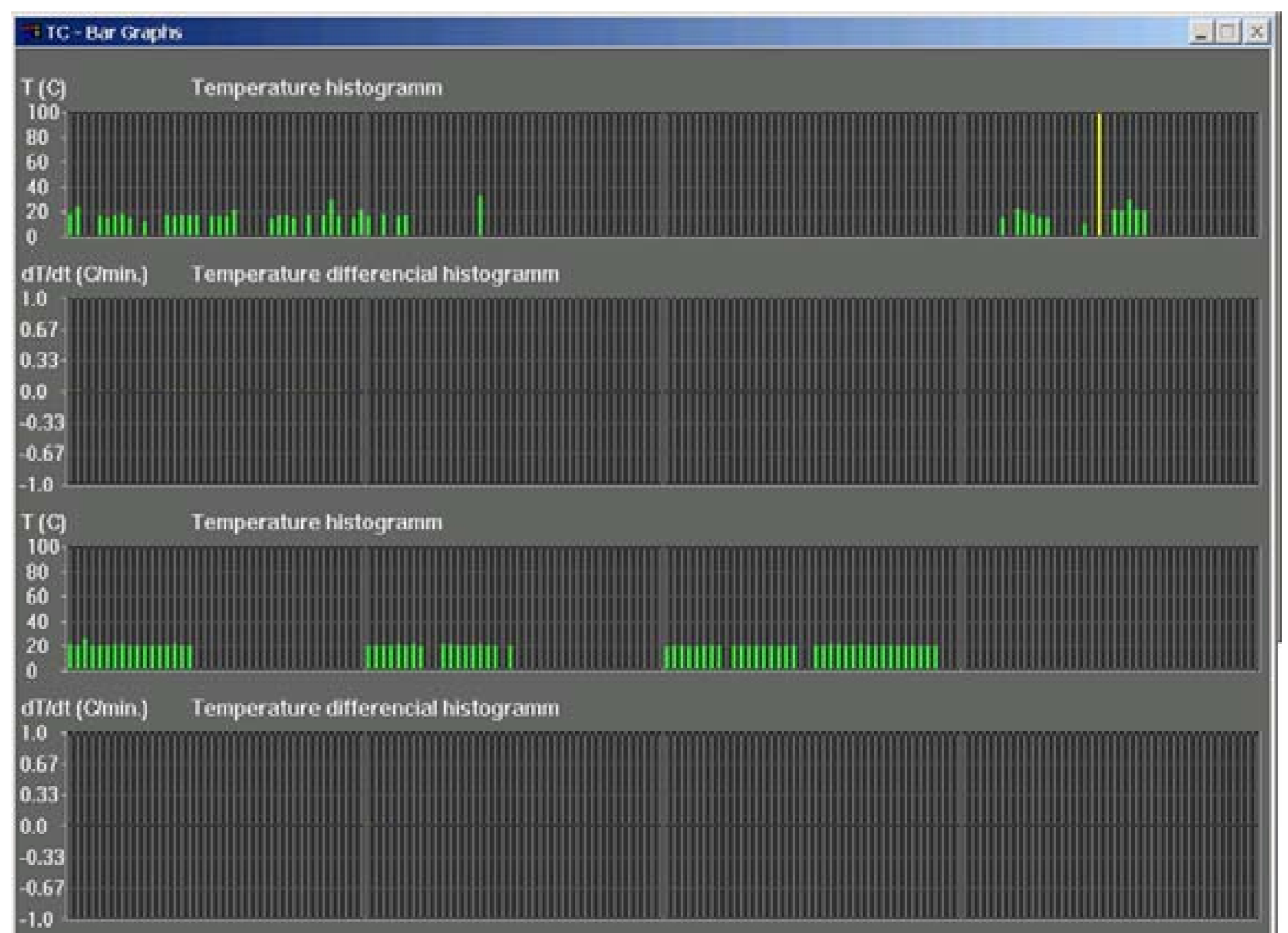
All sensors are represented by small picture in mnemonic scheme, which is situated on the main window of application. The position of the picture of the sensor in scheme corresponds to its location in FEL facility. The color of the sensor reflects actual state of a sensor – Normal, No Data, Warning, and Alarm.



The Epics Channel Access server is build-in inside the application. The value of every sensor is presented as one Process Variable. Using the Channel Archiver application, all values of these PV are stored every 30 second on HDD for further analysis.



The values from all sensors are also presented as a row of vertical columns. Also the second row contains the columns of time derivatives of these values. The color of column reflects the state of sensor, as in the case of the sensor picture in the mnemonic scheme



Flexible tuning of the configuration of the application.

Using external configuration files, the user can specify a few different modes of operation, which include different sets of sensors, different numbers of CANADC40 devices to be used, different pictures of mnemonic schemes and so on. This allows using one control application for all three stages of FEL operation. Depending on content of the configuration file and command-line parameter, the application operates with a corresponding FEL stage.