## A COMPACT SOLUTION FOR DDS-GENERATOR, TURN-ON AND PROTECTIONS IN RADIO FREQUENCY ACCELERATOR

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Max amplitude -5 dBm
Step-ramp-pulse setting
Protections (VSWR, sparks, multipactoring)



The puzzle components inside the box summarize the compact concept of the system. The main components are: the RF generator, turn-on system, protections, microcontroller and display unit. The RF









The system is a sort of smart RF synthesizer including important and essential components of a radio frequency low level control system.

For this reason we have called it the 'Low Level RF Box' (LLRF-Box).

On its own it represents half of a typical RF control system. The

addition of the stabilization loops (amplitude, phase and tuning) and the control interlock complete the low level RF system. The figure on

the right shows the application test carried out with one RF cavity of the k-800 superconducting cyclotron at Infn-Lns.

output, the RF pick-up, the RS422 bus and the

interlock line are the external connections of the box.

 Image: constrained state stat



INFN-LNS General Layout



The 15 MV Tanden



The LLRF-Box system sets frequency, amplitude and initial phase of the RF output. The turn-on operation modes can be set in *automatic, manual* and *one-shot*. The shape of the trapezoidal envelope signal can be modified in terms of step size, step duration and ramp slope. The *pulse mode* can be set in case of cavity conditioning. This digital upgraded version of the previous RF control system allows more freedom in setting and checking the protections and turn-on parameters.





