

# The RF Control System of the SSRF 150MeV Linac

S.M. Hu, J.G. Ding, G.Y. Jiang, L.R. Shen, S.P. Zhong, M.H. Zhao SSRF, SINAP, Shanghai 800-204, P.R. China

## Introduction

The injector of the Shanghai Synchrotron Radiation Facility (SSRF) is a 150 MeV linear electron accelerator.

The RF system of the 150MeV Linac is composed of many individual components with different interfaces. A universal RF device interface was designed and manufactured to accomplish the RF system control mission. Connections between the local controller and RF devices are fully isolated by either the controller interface or the devices itself. Besides direct control devices, there are several subcontrol system:

The controls for the 2 set modulators of RF power system make use of PLCs.

Phase control is a sub-system and consist of a compact PCI cabinet and several modules.

The Sub-Harmonic cavity is tuned by a stepping motor which is controlled through a Serial communication server.

This system has been put into operation since July of 2007, and worked stably .

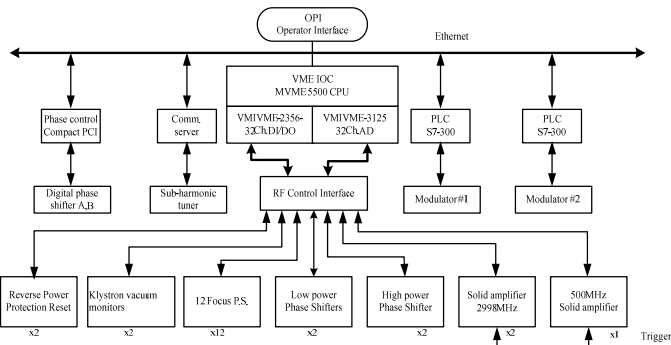


150 MeV Linear accelerator tunnel

## Configuration

VME Controller:	MVME 5500 CPU in a 9 slots cabinet VMIVME 2536 Digital 32 In / 32 Out Ch Isolated Interface VMIVME 3125 Analog 32 Ch A/D Isolated Interface
RF Devices Interface:	SSRF Design & manufacture
PLC:	S7-300 ,for modulators control
Serial comm. server:	Nport-5610, for stepping motor control
Compact PCI:	Phase control
Software:	EPICS 3.14.8.2 ,edm SSRF-edition EPICS Drivers for VME Modules & Comm server S7-PLC epics driver

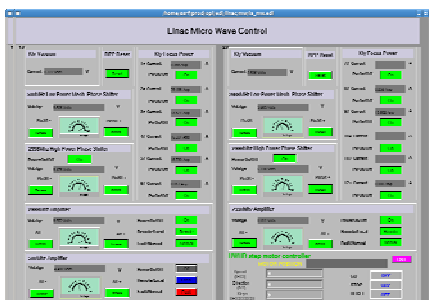
## System operation



Linac RF control architecture

The system operate in standard EPICS environment

- OPI Interface for
- 3 Amplifiers
- 12 Focus P.S.
- 3 Phase Shifters
- 1 Sub-Harmonic cavity
- Klystron vacuum monitors
- Reverse Power Protection Reset



A OPI Page of RF Controller

High-Power Phase Shifter



Sub-Harmonic Cavity



1 of 2 KLY (TED E37302)



12 Focus P.S. of KLY



RF Amplifiers



VME Controller & Device Interface

Control Net



RF Power Supply System (use PLC Controller)



Phase Shifter & Controller Unit