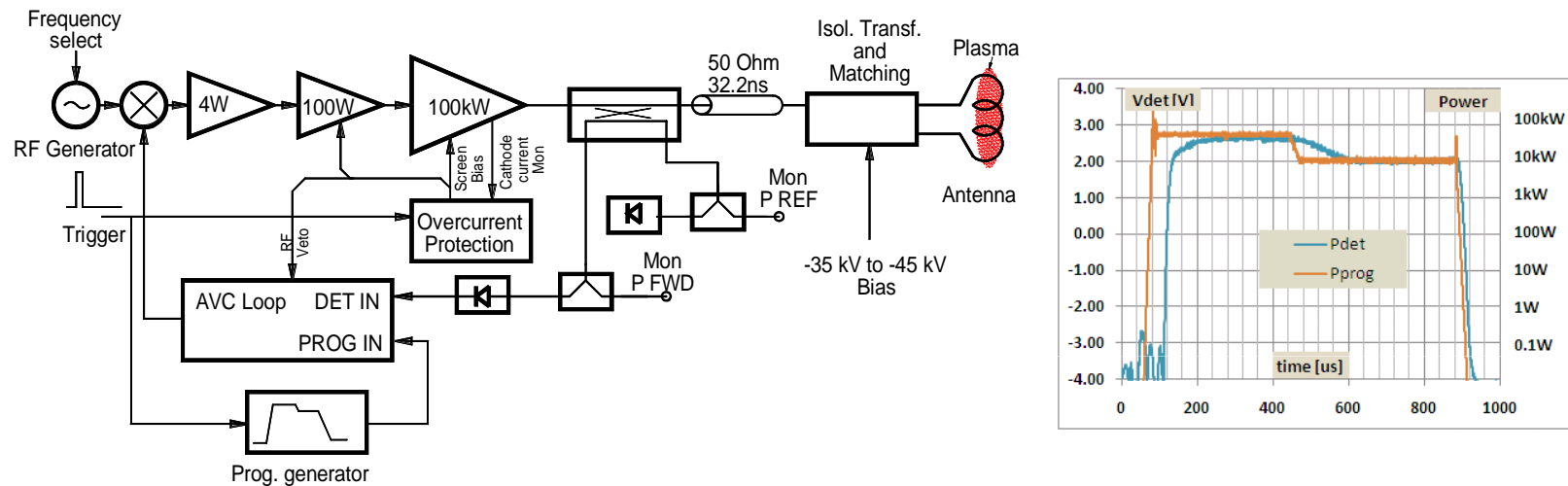




H- Source RF system

- **System description**
- **Present status**
- **Additional developments**
- **Data acquisition and treatment**
- **Installation / maintenance**
- **Required resources**

System description



- Wideband solid-state drivers.
- 2 MHz \pm 200 kHz, 100 kW final stage.
- 2 ms burst at 2 Hz or 50 Hz.
- Wideband, 1÷1 isolation transformer.
- Capacitive matching network.
- PLC Interlock system.

- FWD power controlled by AVC servo system.
- Frequency agile operation compensates plasma detuning effects.
- High directivity directional coupler for plasma electrical characteristics on line measurement.

Present status



Available:

- Two RF systems available.
- One HV supply for 2 Hz operation.
- One HV supply for 50 Hz operation.
- Local frequency and FWD power program generators.
- Spares of all critical items are available.

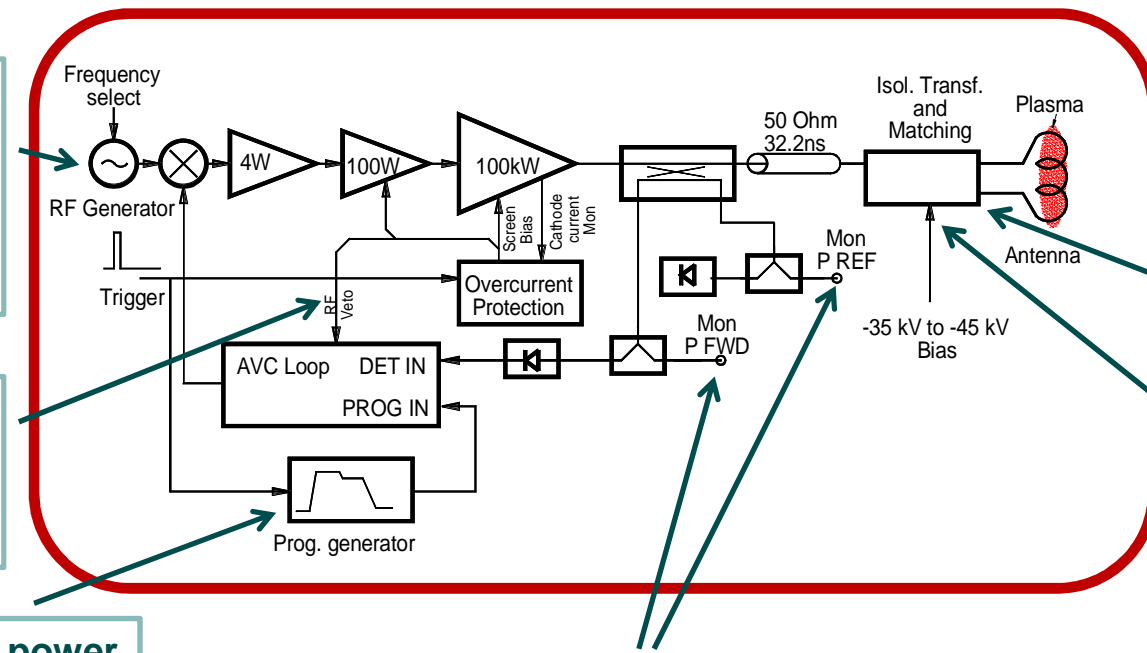
Additional developments

Integration into the control system (Interlock, On/Off controls, etc.)

RF signal from CTL system.
 Generation should include frequency hopping for compensation of the plasma induced detuning.

Electronics for BIC integration.
 ■ RF power enable/veto generation.

GFA for FWD power programming from CTL system.



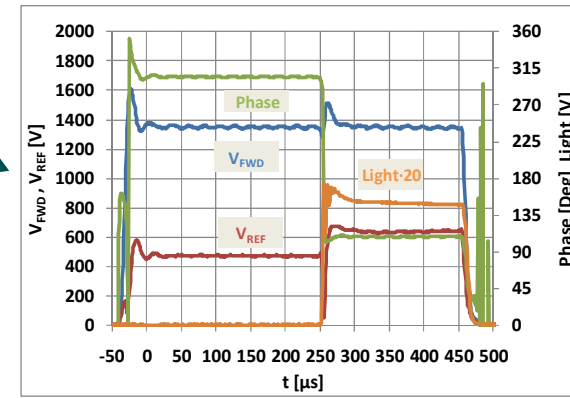
New matching network.

New isolation transformer.

Data acquisition and treatment.
 ■ Acquisition of FWD, REF and RF coil current and plasma light signals
 ■ Amplitude and phase detection.
 ■ Calculation of the plasma electrical characteristics (R_{Plasma} , L_{Plasma} and P_{Plasma})

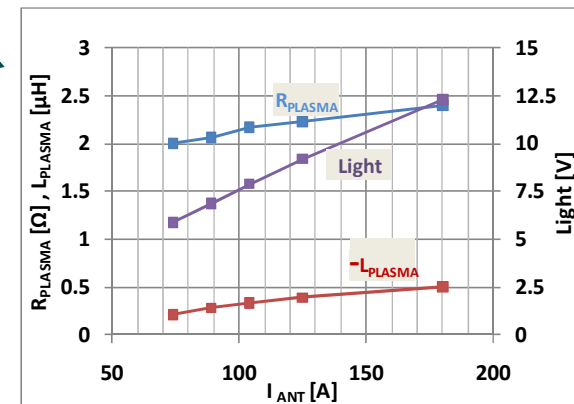
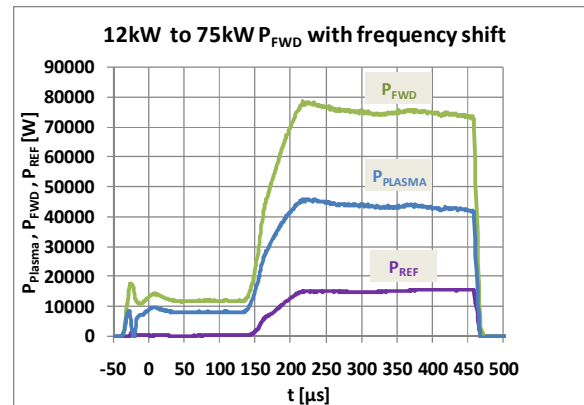
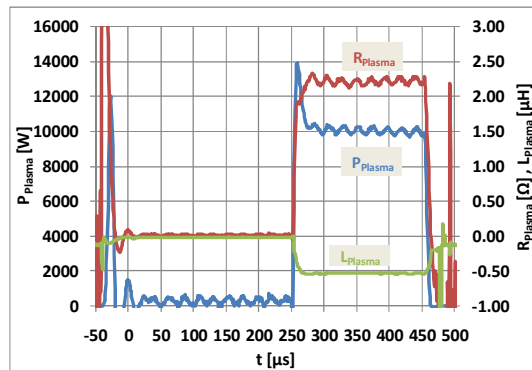
Data acquisition and treatment

FWD, REF and RF coil current are RF signal at 2 MHz: acquisition requires high sampling speed and subsequent amplitude and phase detection.



This data then allow calculation of the plasma electrical characteristics :

R_{Plasma} , L_{Plasma} , P_{Plasma} , etc





Installation and maintenance

Two source shall be available at the same time:

- **Development source (SPL test stand)**
- **Production source (3MeV test stand or Linac4)**

Each component shall be validated in the development source before installation in the production one.

- **This will require a number of iterations and matching network design / construction.**

After installation in Linac4 spares for the parts with limited lifetime must be prepared. They shall also include the parts of the matching network that fit the antenna coil.



Required resources

New isolation transformer & matching network (BE/RF-SR)

2011	0.1 FTE + 0.1 FSU + 10 kCHF	
2012	0.2 FTE + 0.3 FSU + 20 kCHF	
2013	0.2 FTE + 0.2 FSU + 20 kCHF	
2014-2016	0.1 FTE + 0.1 FSU + 10 kCHF	<i>per year</i>

Integration in the control system (BE/RF-CS)

2011	0.2 FTE + 0.1 FSU + 20 kCHF
2012	0.2 FTE + 0.1 FSU + 20 kCHF
2013	0.3 FTE + 0.1 FSU + 20 kCHF