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2 Overview of Instrument Design, Data Handling Process and Product Generation

The instrument is composed of two main elements:

- a sensor unit and
- an electronics board.

The sensor is mounted on the upper boom. The electrode array is linear and includes one receiving dipole (R1 - R2) and two transmitting monopoles (T1 and T2) supported by a conductive bar, about 1 m in length and 2 cm in diameter. In its active mode, MIP can be operated with different transmitting configurations:

- T1 and T2 can be used as transmitters, independently or conjointly in phase or anti-phased. Due to its technical principle, this enables to properly analyze plasmas with Debye length lower than a few tens of cm and give rise to the so-called Short Debye Length mode.
- To overcome this limit, the Long Debye Length mode has been implemented. In this mode, one of the two Langmuir probes of the LAP instrument (LAP2) is used as a transmitter, enabling plasmas with Debye length up to ~2m to be investigated.

← spacecraft

← frames

The orientation of the MIP sensor with respect to the ~~SPICE~~ ^{SPICE} is also given in the SPICE ~~TK~~ ^{kernel} ROS_VXX.TF (XX is the version) which can be found in the PSA SPICE volume ROS-E-M-A-C-SPICE-6-V1.0 (<http://www.rssd.esa.int>).

In its passive mode, this instrument has also the capability of a plasma wave analyser.

The electronics board is located inside the RPC-0 box. It assumes four functions:

- acquisition of the analog signal from 7 kHz to 3.5 MHz
- data processing using FFT and DFT calculations and some mathematical functions
- a FPGA controls the frequency synthesis and the data storage
- a second FPGA manages the transfer protocol (IEEE 1355) with the PIU.