

RubiGal Preliminary Exposure November 2008

GENERAL OVERVIEW:

As a part of the Galileo Applications program, AccuBeat Ltd is developing the “RubiGal”.

RubiGal integrates a Rubidium Frequency Standard and GNSS (Global Navigation Satellite System) receivers – Galileo and GPS.

The combination of Rubidium Frequency Standard with several GNSS receivers provides number of advantages:

- Improving time and frequency accuracy
- Improving position accuracy
- Providing continuity and availability of services
- Integrity information.

RubiGal is intended for use in a variety of applications such as:

- Synchronization of wireline and wireless communication networks
- Scientific and calibration labs
- Test equipment calibration and more.
- Transportation and aviation.
- Frequency hopping.
- Emitter location.

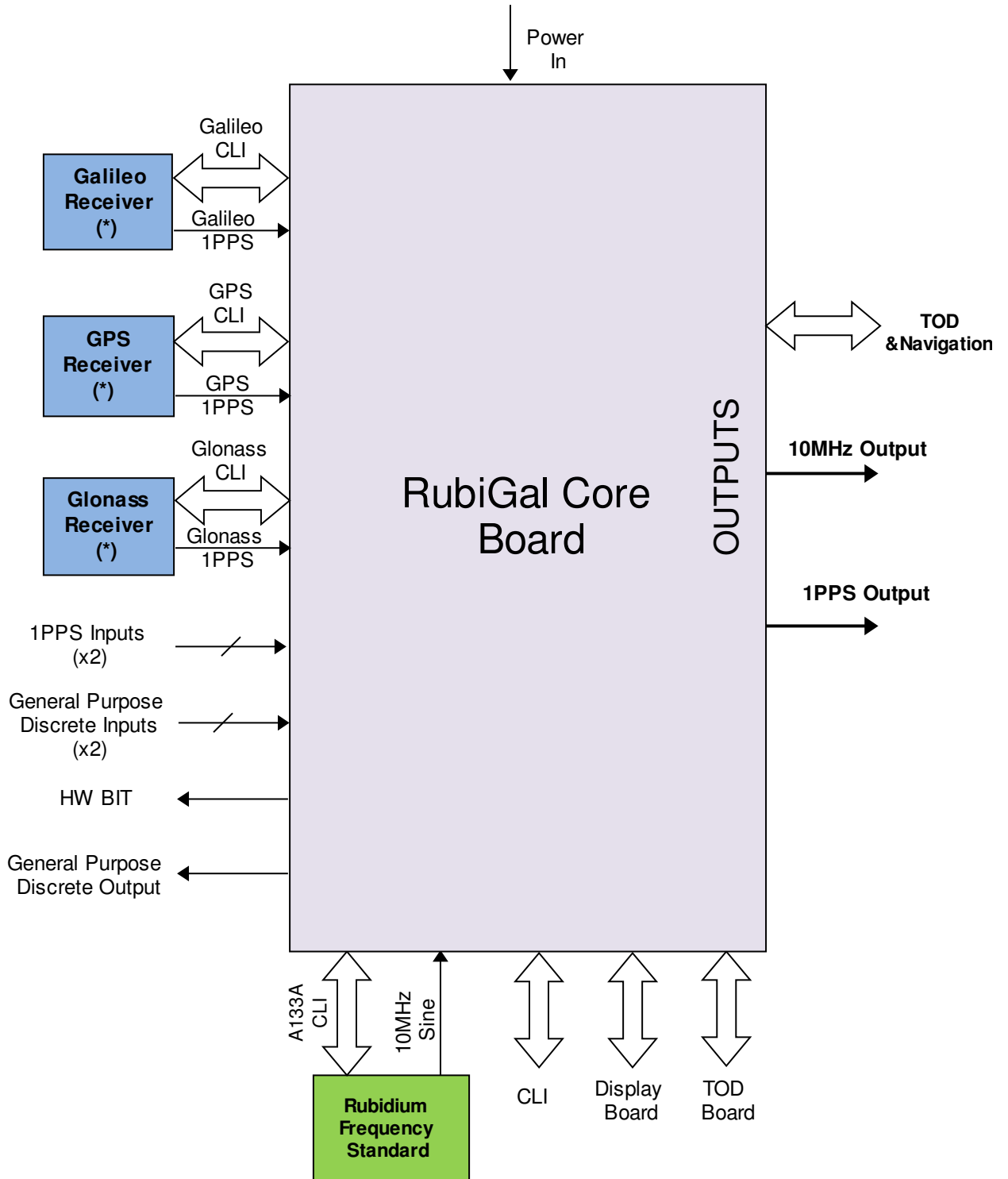
The first phase of the project will use a conventional **Rubidium-Frequency-Standard** (AccuBeat’s model AR133A).

In the second phase the AR133A shall be replaced by low power **CPT Rubidium-Frequency-Standard** targeting at low power mobile applications.

The CPT clock (which is named **NAC - Nano Atomic Clock**) is a novel, miniature, and low power consumption clock currently being under development at AccuBeat Ltd.

INTERFACES:

Preliminary interfaces diagram is shown in the following figure (some of the inputs or outputs are optional):



(*) The GNSS receivers can be included in the RubiGal core board.

INTERFACE DESCRIPTION:

Main Outputs – frequency, Timing and Navigation

- 10MHz output – ultra accurate 10MHz output
- 1PPS output – ultra accurate timing
- TOD & Navigation – communication channel which contains the TOD information (time and date) and navigation information (position).

Secondary Outputs

- HW BIT – hardware built in test output.
- General purpose digital outputs – indication to external device.

Inputs

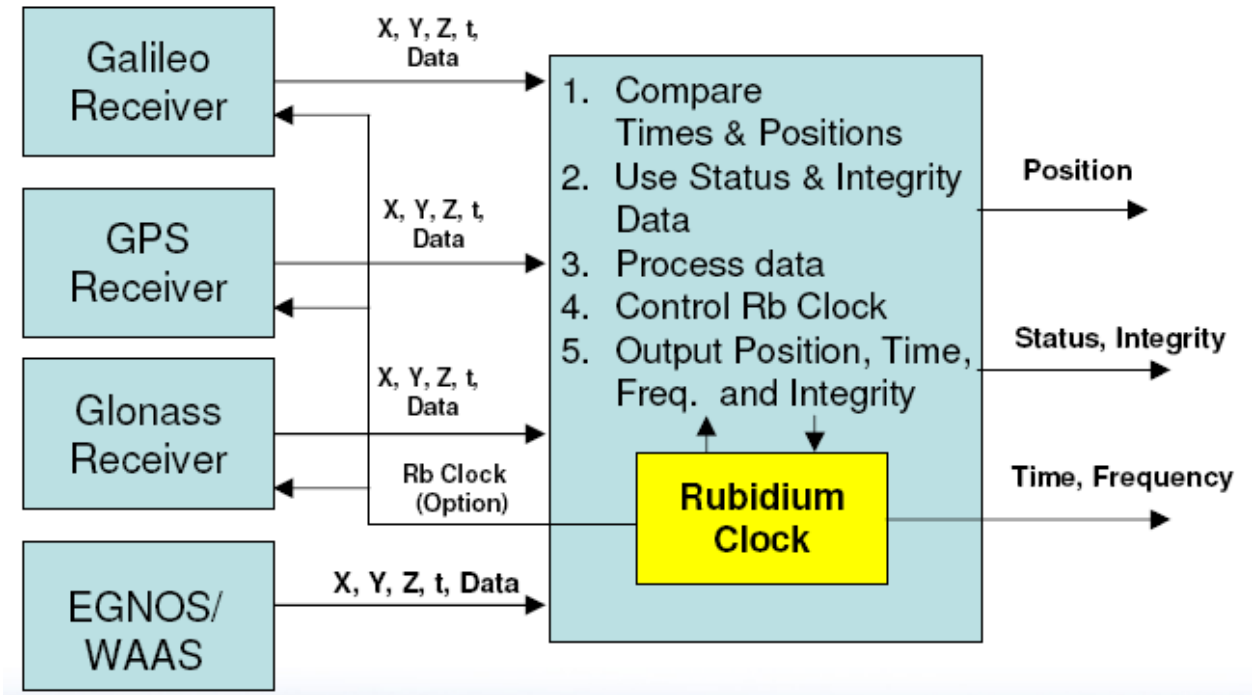
- Power in – supply DC power to the unit.
- 1PPS inputs –discipline the Rubidium Frequency Standard and synchronize the 1PPS output.

General Communication Channels

- CLI – Rx/Tx channel allows the user to control the unit (e.g., change between modes) and to receive information (e.g., status).
- Display board - communication to external display panel.
- TOD board – communication to external TOD board.
- AR133A CLI – communication to the Rubidium Frequency Standard (AR133A or NAC).

RubiGal CONCEPT:

A conceptual block diagram is shown in the following figure:



RubiGal product will include several inputs for GNSS receivers (Galileo, GPS and GLONASS as option), Rubidium Frequency Standard and a processing unit. The processing unit implements smart algorithm that processes the signals and the data obtained from all sources to deliver an improved and high integrity time, frequency and position.