# Gps Time

*Component Design Document*

## 1 Description

The System Time component is a servicing component which provides the system time in GPS format to any component who requests it. Internally, the system time is provided by the Ada.Real_Time library.

## 2 Requirements

This document specifies a set of requirements for the System Time GPS component of HISIE FSW

1. FSW will store time as 32 bits of seconds and 32 bits of subseconds.

## 3 Design

### 3.1 At a Glance

Below is a list of useful parameters and statistics that give a quick look into the makeup of the component.

- **Execution** - *passive*
- **Number of Connectors** - 1
- **Number of Invokee Connectors** - 1
- **Number of Invoker Connectors** - *None*
- **Number of Generic Connectors** - *None*
- **Number of Generic Types** - *None*
- **Number of Unconstrained Arrayed Connectors** - *None*
- **Number of Commands** - *None*
- **Number of Parameters** - *None*
- **Number of Events** - *None*
- **Number of Faults** - *None*
- **Number of Data Products** - *None*
- **Number of Data Dependencies** - *None*
- **Number of Packets** - *None*

## 3.2 Diagram

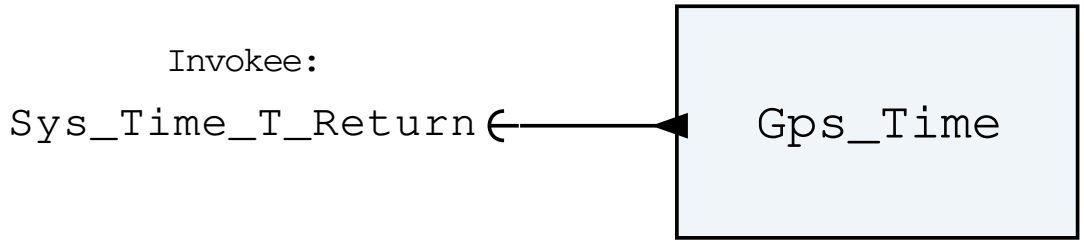


Figure 1: Gps Time component diagram.

## 3.3 Connectors

Below are tables listing the component's connectors.

### 3.3.1 Invokee Connectors

The following is a list of the component's *invokee* connectors:

Table 1: Gps Time Invokee Connectors

| Name | Kind | Type | Return_Type | Count |
|---|---|---|---|---|
| Sys_Time_T_Return | return | - | Sys_Time.T | 1 |

Connector Descriptions:

- **Sys_Time_T_Return** - The system time is provided via this connector.

### 3.3.2 Invoker Connectors

None

## 3.4 Initialization

Below are details on how the component should be initialized in an assembly.

### 3.4.1 Component Instantiation

This component contains no instantiation parameters in its discriminant.

### 3.4.2 Component Base Initialization

This component contains no base class initialization, meaning there is no `init_Base` subprogram for this component.

### 3.4.3 Component Set ID Bases

This component contains no commands, events, packets, faults or data products that need base indentifiers.

### 3.4.4 Component Map Data Dependencies

This component contains no data dependencies.

### 3.4.5 Component Implementation Initialization

This component contains no implementation class initialization, meaning there is no `init` subprogram for this component.

# 4 Unit Tests

None

# 5 Appendix

## 5.1 Packed Types

The following section outlines any complex data types used in the component in alphabetical order. This includes packed records and packed arrays that might be used as connector types, command arguments, event parameters, etc..

### Sys_Time.T:

A record which holds a time stamp using GPS format including seconds and subseconds since epoch (1-5-1980 to 1-6-1980 midnight).

Table 2: Sys_Time Packed Record : 64 bits

| Name | Type | Range | Size (Bits) | Start Bit | End Bit |
|---|---|---|---|---|---|
| Seconds | Interfaces. Unsigned_32 | 0 to 4294967295 | 32 | 0 | 31 |
| Subseconds | Interfaces. Unsigned_32 | 0 to 4294967295 | 32 | 32 | 63 |

Field Descriptions:

- **Seconds** - The number of seconds elapsed since epoch.
- **Subseconds** - The number of 1/(2^32) sub-seconds.