Ticker
Component Design Document

1 Description

This is the ticker component.

2 Requirements

No requirements have been specified for this component.

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** - *active*
- **Number of Connectors** - 2
- **Number of Invokee Connectors** - *None*
- **Number of Invoker Connectors** - 2
- **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*
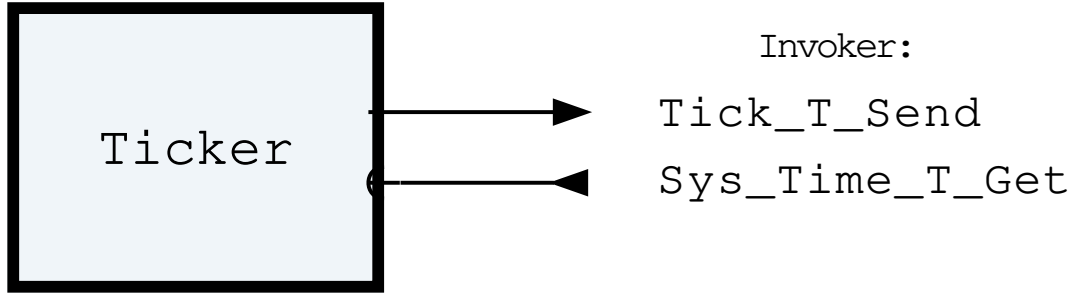- **Number of Packets** - *None*

3.2 Diagram

Figure 1: Ticker component diagram.

3.3 Connectors

Below are tables listing the component's connectors.

3.3.1 Invokee Connectors

None

3.3.2 Invoker Connectors

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

Table 1: Ticker Invoker Connectors

Name	Kind	Type	Return_Type	Count
Tick_T_Send	send	Tick.T	-	1
Sys_Time_T_Get	get	-	Sys_Time.T	1

Connector Descriptions:
- **Tick_T_Send** - The sched send connection
- **Sys_Time_T_Get** - The system time is retrieved via this connector.

3.4 Initialization

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

3.4.1 Component Instantiation

The ticker component is instantiated with the desired tick period in microseconds. This component contains the following instantiation parameters in its discriminant:

Table 2: Ticker Instantiation Parameters

Name	Type
Period_Us	Positive

Parameter Descriptions:

- **Period_Us** - The tick period in microseconds

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 3: 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.

Tick.T:

The tick datatype used for periodic scheduling. Included in this type is the Time associated with a tick and a count.

Table 4: Tick Packed Record : 96 bits

Name	Type	Range	Size (Bits)	Start Bit	End Bit
Time	Sys_Time.T	-	64	0	63
Count	Interfaces. Unsigned_32	0 to 4294967295	32	64	95

Field Descriptions:
- **Time** - The timestamp associated with the tick.

- **Count** - The cycle number of the tick.