```
context Ctx_IPC

 extends Ctx_PartProc_Manage

sets PORTS
      PORT_DIRECTIONS
      PORT_MODES
      MESSAGES
      QUEUING_DISCIPLINE
      BLACKBOARD_INDICATORTYPE EVENT_STATE BUFFERS BLACKBOARDS SEMAPHORES EVENTS
BufferWaitingTypes

constants PORT_SOURCE
            PORT_DESTINATION
            PORT_MODE_SAMPLING
            PORT_MODE_QUQUING
            QUEUE_FIFO QUEUE_PRIORITY BB_EMPTY BB_OCCUPIED EVENT_UP EVENT_DOWN SamplingPorts
            QueuingPorts
            Source_SamplingPorts
            Dest_SamplingPorts
            Source_QueuingPorts
```

Dest_QueuingPorts
Sampling_Channels Queuing_Channels
Ports_of_Partition
Mode_of_Ports Direction_of_Ports MaxMsgSize_of_Ports
MaxMsgNum_of_QueuingPorts
WAITING_R
WAITING_W

**axioms**

@axm_finite_ports finite(**PORTS**)
@axm_finite_msg finite(**MESSAGES**)
@axm_ports_partition partition(**PORTS**,**SamplingPorts**,**QueuingPorts**)
@axm_queueports_partition partition(**QueuingPorts**,**Source_QueuingPorts**,**Dest_QueuingPorts**)
@axm_sampports_partition partition(**SamplingPorts**,**Source_SamplingPorts**, **Dest_SamplingPorts**)
@axm_samp_channels **Sampling_Channels** $\in$ **Dest_SamplingPorts** $\twoheadrightarrow$ **Source_SamplingPorts**
@axm_que_channels **Queuing_Channels** $\in$ **Source_QueuingPorts** $\rightarrowtail\!\!\!\!\!\twoheadrightarrow$ **Dest_QueuingPorts**
@axm_portdirect_partition partition(**PORT_DIRECTIONS**,{**PORT_SOURCE**},{**PORT_DESTINATION**})
@axm_portmode_partition partition(**PORT_MODES**,{**PORT_MODE_SAMPLING**},{**PORT_MODE_QUQUING**})
@axm_quediscipline partition(**QUEUING_DISCIPLINE**,{**QUEUE_FIFO**},{**QUEUE_PRIORITY**})
@axm_bbindicator partition(**BLACKBOARD_INDICATORTYPE**,{**BB_EMPTY**},{**BB_OCCUPIED**})
@axm_event_state partition(**EVENT_STATE**,{**EVENT_UP**},{**EVENT_DOWN**})

@axm_portsofpartition **Ports_of_Partition**∈**PORTS**→**PARTITIONS**

@axm_modeofports **Mode_of_Ports**∈**PORTS**→ **PORT_MODES**

@axm_directofports **Direction_of_Ports**∈**PORTS**→ **PORT_DIRECTIONS**

@axm_maxmsgsize_of_ports **MaxMsgSize_of_Ports**∈**PORTS** → ℕ1

@axm_maxmsgnum_of_queports **MaxMsgNum_of_QueuingPorts** ∈ **QueuingPorts** → ℕ1

@axm_srcport_direct ∀p·(p∈(**Source_SamplingPorts**∪**Source_QueuingPorts**)⇒
**Direction_of_Ports**(p)=**PORT_SOURCE**)

@axm_destport_direct ∀p·(p∈(**Dest_SamplingPorts**∪**Dest_QueuingPorts**)⇒
**Direction_of_Ports**(p)=**PORT_DESTINATION**)

@axm_sampports **SamplingPorts** = **Mode_of_Ports**~[{**PORT_MODE_SAMPLING**}]

@axm_queueports **QueuingPorts** = **Mode_of_Ports**~[{**PORT_MODE_QUQUING**}]

@axm_src_sampports **Source_SamplingPorts** = **SamplingPorts** ∩ **Direction_of_Ports**~[{**PORT_SOURCE**}]

@axm_dest_sampports **Dest_SamplingPorts** = **SamplingPorts** ∩
**Direction_of_Ports**~[{**PORT_DESTINATION**}]

@axm_src_queueports **Source_QueuingPorts** = **QueuingPorts** ∩ **Direction_of_Ports**~[{**PORT_SOURCE**}]

@axm_dest_queueports **Dest_QueuingPorts** = **QueuingPorts** ∩ **Direction_of_Ports**~[{**PORT_DESTINATION**}]

@axm_finite_buffers finite(**BUFFERS**) ∧ card(**BUFFERS**)=1024

@axm_finite_blackboards finite(**BLACKBOARDS**) ∧ card(**BLACKBOARDS**)=1024

@axm_finite_semaphores finite(**SEMAPHORES**) ∧ card(**SEMAPHORES**)=1024

@axm_finite_events finite(**EVENTS**) ∧ card(**EVENTS**)=1024

@axm_waiting_types partition(**BufferWaitingTypes**,{**WAITING_R**},{**WAITING_W**})

```
end
```