



SNS COLLEGE OF TECHNOLOGY

Coimbatore-35
An Autonomous Institution



Accredited by NBA – AICTE and Accredited by NAAC – UGC with 'A++' Grade
Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai

DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

19ECT312 – EMBEDDED SYSTEM DESIGN

III YEAR/ VI SEMESTER
1

UNIT 4 :Embedded Operating System and Modelling

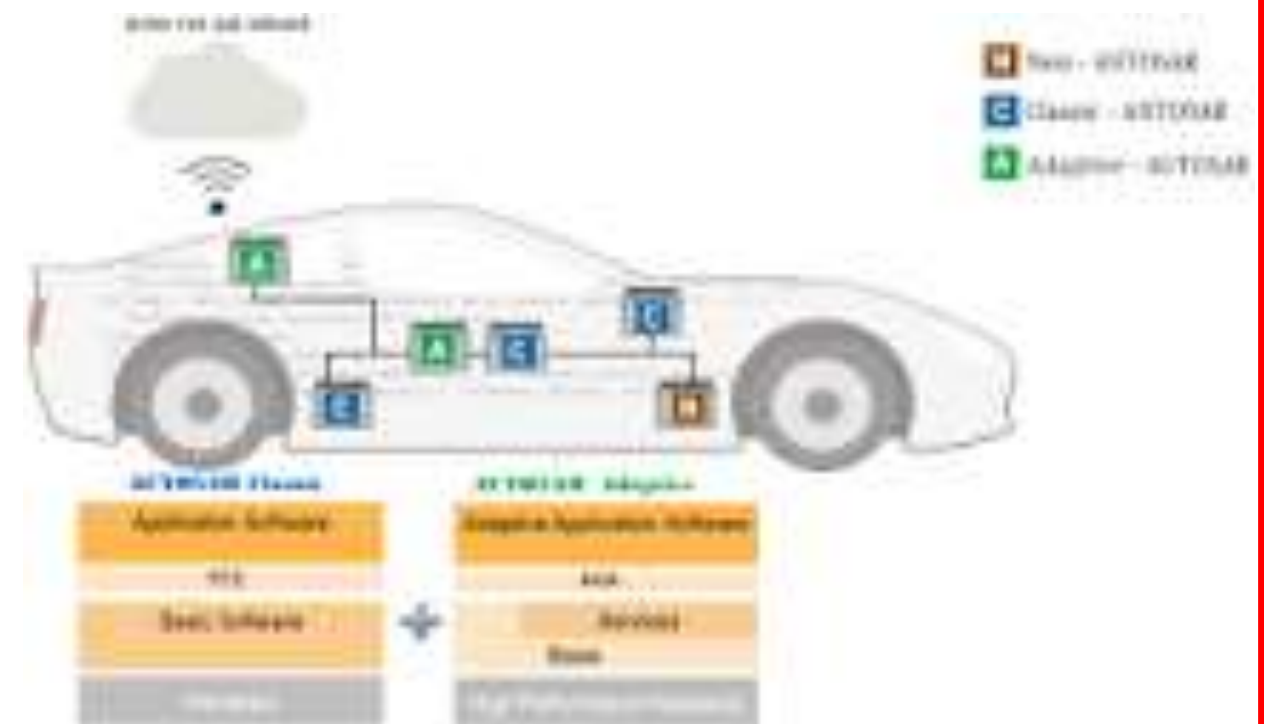
TOPIC 4. 10 : AUTOSAR



AUTOSAR



❖AUTOSAR (AUTomotive Open System ARchitecture) is a worldwide development partnership of vehicle manufacturers, suppliers, and other companies from the electronics, semiconductor, and software industries.





Importance of AUTOSAR



- Standardization
- Modularity and Reusability
- Scalability
- Flexibility and Customization
- Interoperability and Supplier Collaboration
- Adaptability to Future Technologies



Need of AUTOSAR

- Embedded systems is a vast field having n number of semiconductor manufacturers, hardware and software platforms which can be selected based on application requirements. Due to such varieties, the development effort is tough and the portability of code is hard which further increases the development cost.
- A automotive is a complex machine which consists of n number of small embedded systems called Electronic control Unit(ECUs) so maintenance and development of code for such controllers is not easy. Further complexity is increased if different ECUs use different MCUs for meeting cost requirements, then each ECU will have different software as hardware platforms will be different.
- To partially standardize things, sometimes there is also a need to develop and follow custom created standard (Custom standard means to develop a **protocol** for communication which is agreed by all ECUs in network) to communicate with other ECUs. This is the conventional way of writing software which is very hard to maintain and has very less chance of code portability or reuse ability.
- A automobile has n number of parts which are manufactured by different companies called **Tier 1** companies which supplies the parts to OEMs like BMW, Volkswagen, etc. Today almost all mechanical parts are becoming intelligent by adding ECU in them to increase control and efficiency. So those ECUs also need to have a **common way** of communication to communicate with the ECUs of OEM for this again a custom standard needs to be implemented and maintained



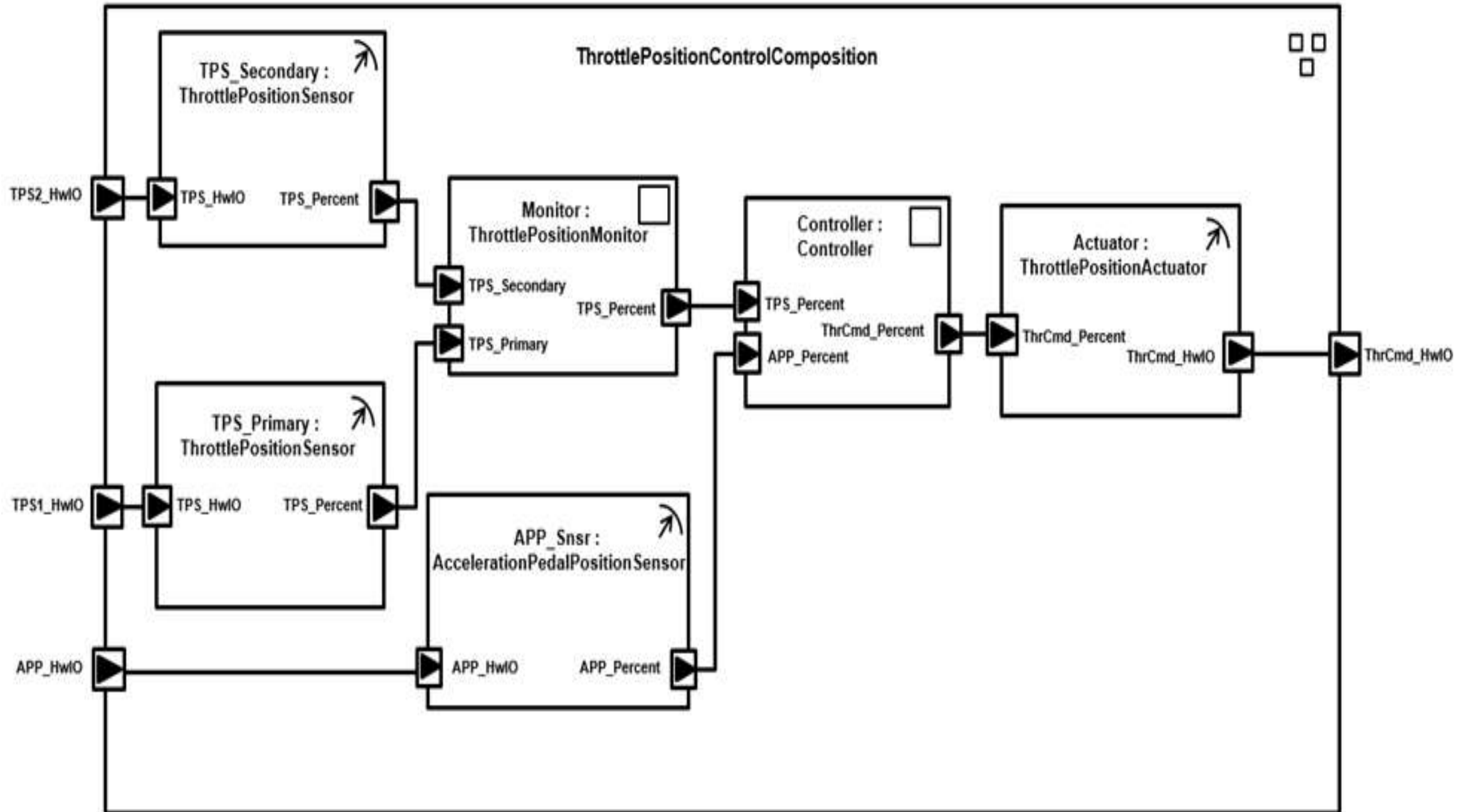
AUTOSAR Components



- AUTOSAR software components are reusable building blocks of AUTOSAR software
- An AUTOSAR software component encapsulates one or more algorithms and communicates with its environment through well-defined ports



AUTOSAR Software Components and Compositions





AUTOSAR Software Components and Compositions



- *AUTOSAR software components* are reusable building blocks of AUTOSAR software. An AUTOSAR software component encapsulates one or more algorithms and communicates with its environment through well-defined ports
- An AUTOSAR software component connects to an AUTOSAR runtime environment for communicating with other software components and software in the Basic Software layer of the AUTOSAR software architecture. You can reuse and relocate software components between ECUs
- In Simulink[®], you represent AUTOSAR software components with Simulink model components, such as Model, subsystem, and Simulink Function blocks
- *AUTOSAR compositions* are AUTOSAR software components that aggregate groups of software components that have related functionality
- A composition is a system abstraction that facilitates scalability and helps to manage complexity when designing the logical representation of a software application.



AUTOSAR Software Components and Compositions

The composition consists of software components that represent:

- Two throttle position sensors
- Throttle position monitor
- Acceleration pedal position sensor
- Controller
- Throttle position actuator



Thank you