

Higher Layer Protocol

# CAN Kingdom



# General Properties

- CAN Kingdom is developed for machine control system use.
- Especially designed for systems consisting of independently developed modules.
- It's a control network, and modules serve the network.
- CAN Kingdom makes separation of module and system development both possible and simple.
- A module designer can make general modules. Knowledge of the system is not needed.
- In CAN real-time features are essential. CAN kingdom is especially design to face the problems of real-time.
- CAN Kingdom needs a short setup phase during system initialization.
- CAN Kingdom enforces a conform documentation of modules and system.

# CAN Kingdom

- A great advantage of CAN Kingdom is that it's not really a complete HLP. Instead it's a set of protocol primitives, especially for real-time systems.
- The system designer can choose primitives when designing a system, with all the needs concerning topology and bus access management.

# CAN Kingdom Identifiers

- All CAN messages must have a unique CAN identifier, the system designer is the only one who knows all the messages in the system
- The relative real-time demands between the different messages is only known by the system designer
- Consequently the system designer is the *only* one how can assign appropriate identifiers to a message.
- In CAN Kingdom a module designer *never* has to care about CAN identifiers.

# CAN Kingdom

- Because of everything mentioned so far it's evident that the system designer and module designer can work independently of each other to a large extent.
- This opens the way for system developers to find suitable third party modules that easily can be integrated into their system.

# Modules Serves the Network

- The usual concept is: *The Network Serves the Modules (NSM)*. A connected module knows its role in the system and asks for the means.
- In a system design with the principle: *The Modules are to Serve the Network (MSN)* the network will be tailormade to the needs of your machine.
- MSN is possible since all system requirements are known a priori.

# Terminology

CAN Kingdom uses the analogy of human societies and organization in its terminology.

The king in the capital rules the kingdom and each city has a mayor responsible for local government. Each city produces something and can export or import information.

Kingdom communication is done by mail.



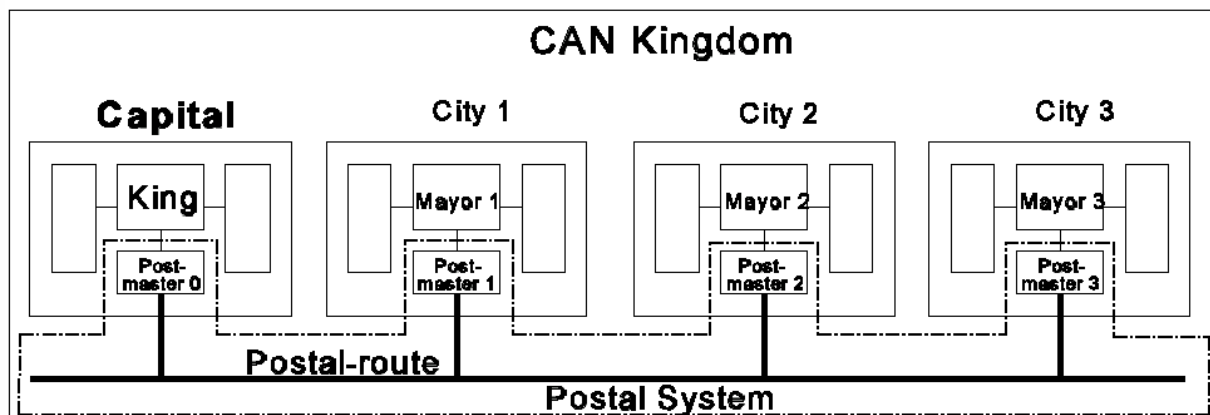
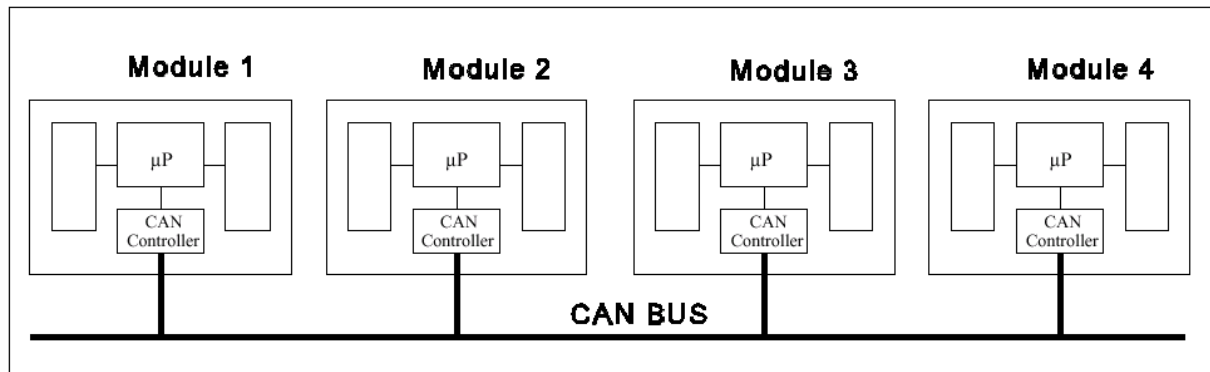
# Terminology

- The kingdom is the CAN system.
- The king/capital is the network manager.
- The royal postal system is the CAN network.
- Each city has a post office and a postmaster, symbol for the CAN controller.
- The mayor/city is the local microprocessor.
- Letters are CAN messages.



# CAN Terminology

CAN system:



# Terminology

To build up an information structure there are nine building blocks:

- Envelopes
- Pages
- Lines
- Bits
- Letters
- Forms
- Documents
- Folders
- Lists

# Who can use CAN Kingdom?

- ***System builders*** who want to use modules from different suppliers.
- ***Module suppliers*** that want to design modules that easily can be adjusted to fit different systems.
- ***People who develop both system and modules themselves*** can also take advantage of CAN Kingdom. This by getting help doing an efficient network design.