

TIME DIVISION SWITCHING

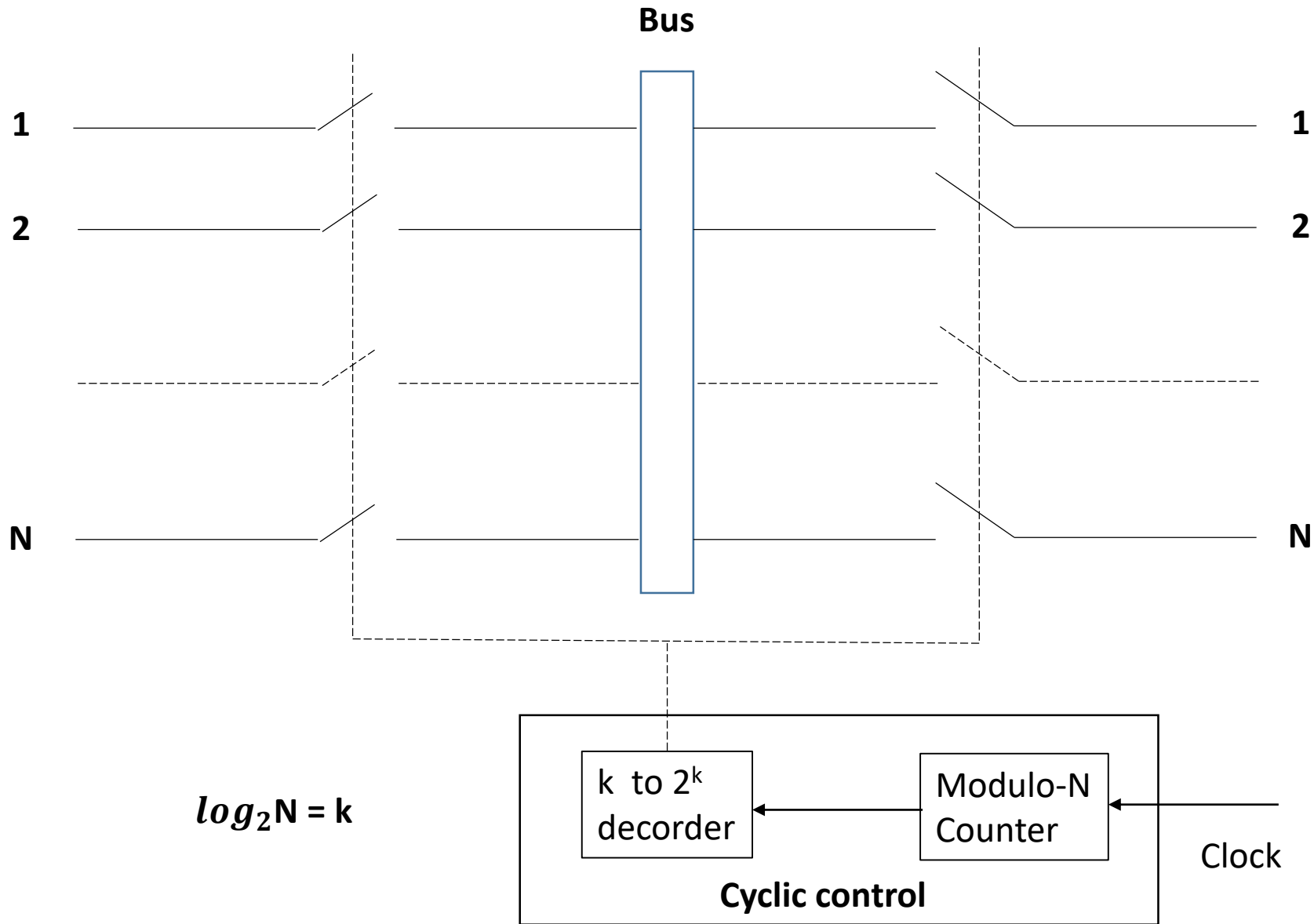
ETI 2506 – TELECOMMUNICATION SYSTEMS

Saturday, 03 December 2016

PRINCIPLE OF TIME DIVISION SWITCHING

- In TDM systems, speech is transmitted as PCM binary words.
- Sampled at 8,000 bits/sec, as sample occurs at $\frac{1}{8.000} = 125\mu\text{sec}$
- Using contemporary digital technology, a sample can be passed from input to output of a switch in a small fraction of the 125 μsec interval.
- By dynamically assigning a number of input and output pairs, a digital switch can be used to transmit a number of speech samples simultaneously.

ANALOG TIME DIVISION SWITCH (PAM) SWITCH



Number of Simultaneous Conversations, SC

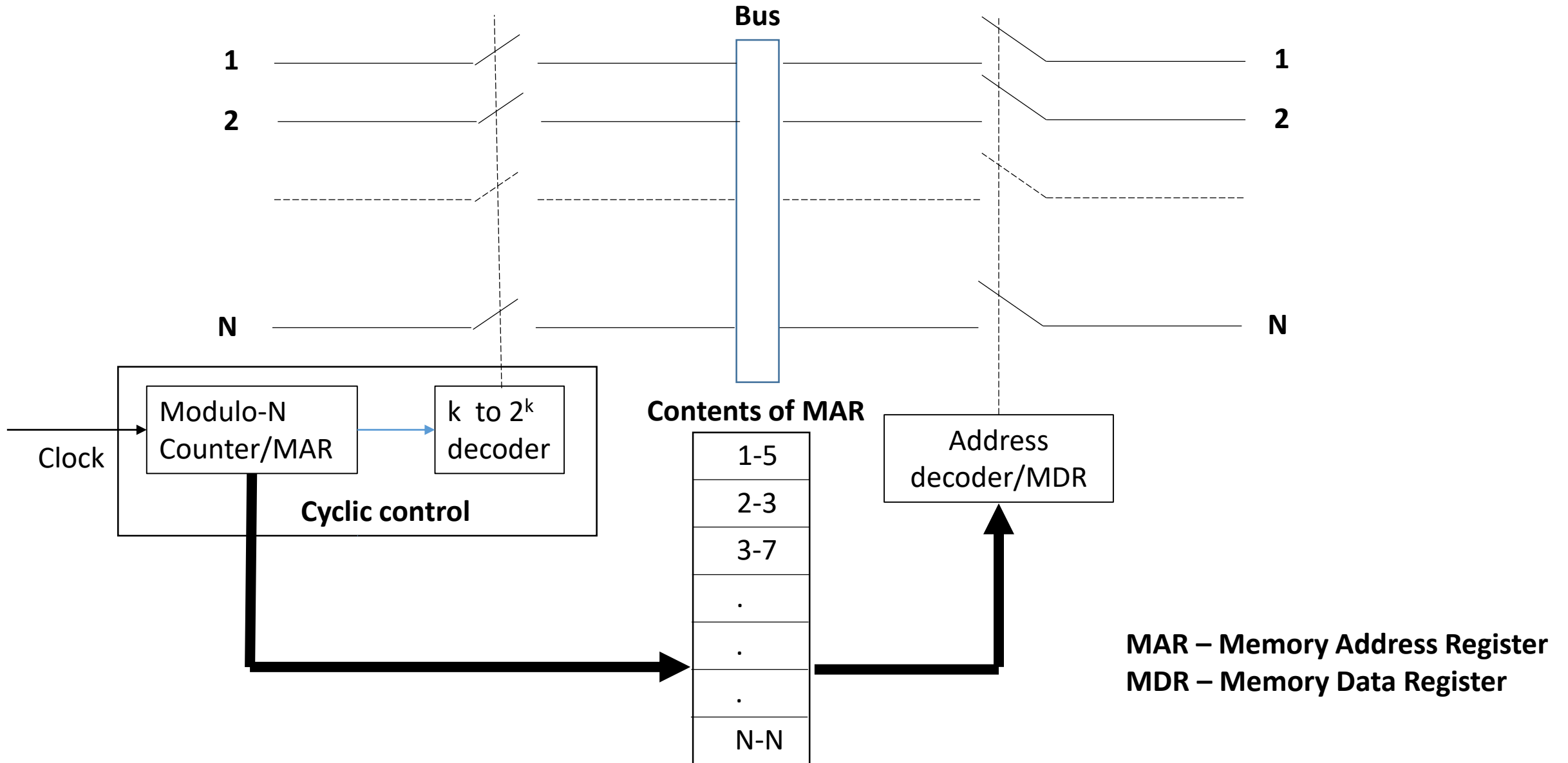
$$SC = \frac{125}{t_s}$$

Where t_s is the time required by the cyclic controller to set up the connection and transfer the data sample.

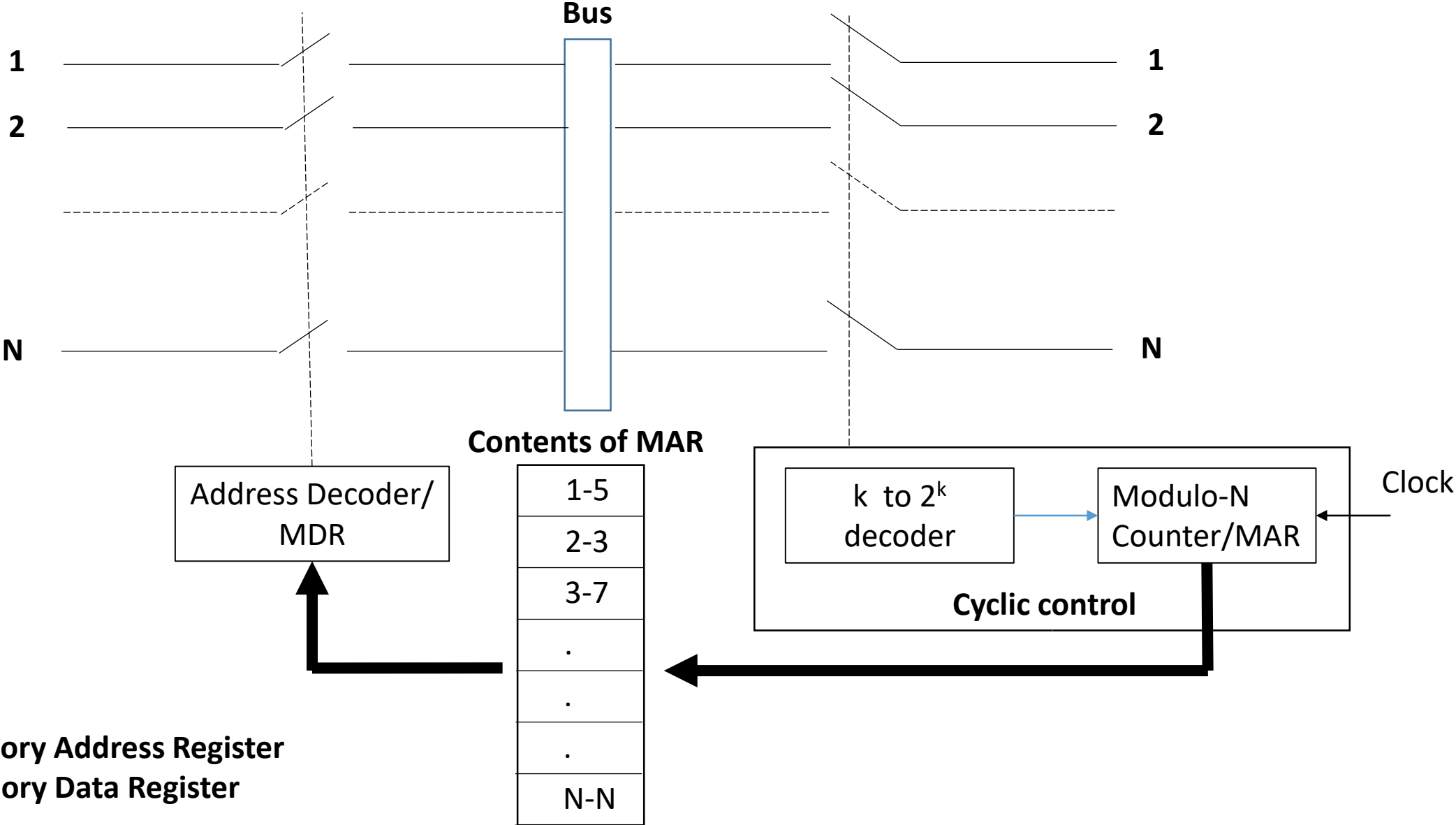
Operation Mode

Non-blocking but not fully available, i.e not possible to connect any input to any output.

INPUT-CONTROLLED TIME DIVISION SWITCH



OUTPUT-CONTROLLED TIME DIVISION SWITCH



MAR – Memory Address Register
MDR – Memory Data Register

CAPACITY OF TIME DIVISION SWITCH

Switch capacity, SC is given by:

$$SC = \frac{125}{t_i + t_m + t_d + t_t}$$

Where

t_i = time to increment modulo N counter in μsec

t_m = time to read from the control memory

t_d = time to decode address and to select inlet or outlet

t_t = time to transfer sample from inlet to outlet

GENERALIZED TIME DIVISION SWITCH

