Pulse Code Modulation Example

ITS323: Introduction to Data Communications

Sirindhorn International Institute of Technology
Thammasat University

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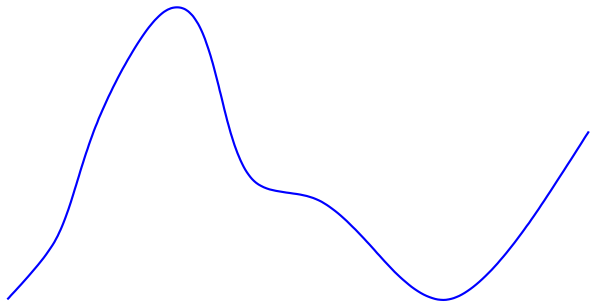
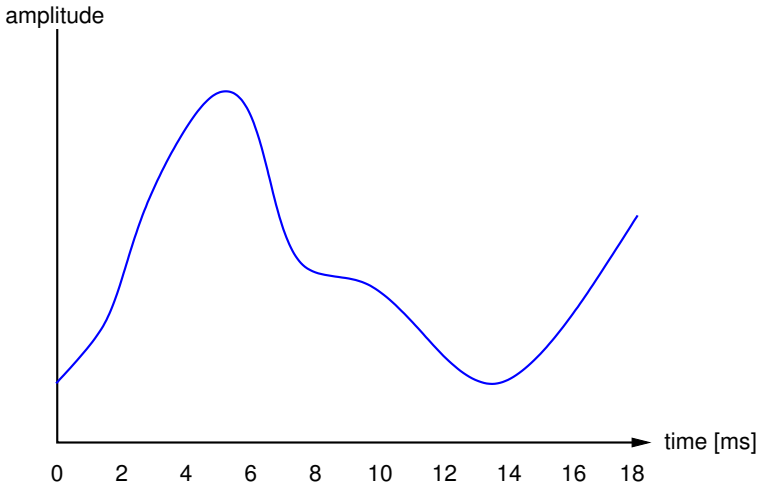
ITS323Y12S1H07, Steve/Courses/2012/s1/its323/lectures/sampling.tex, r2336

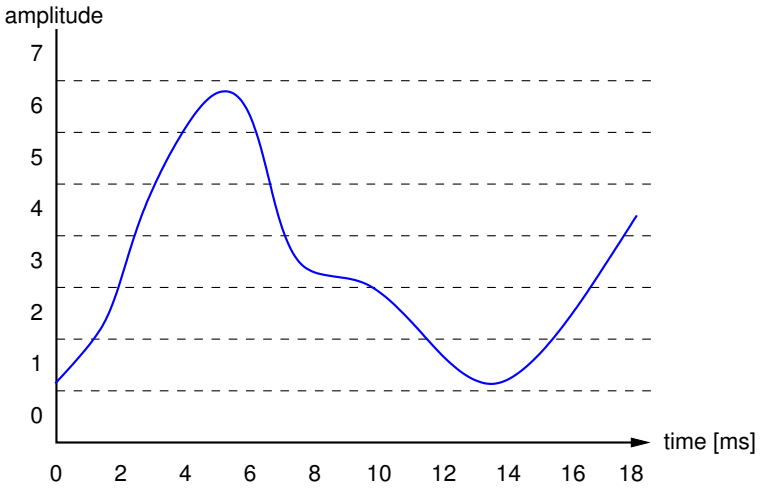
Input Analog Data



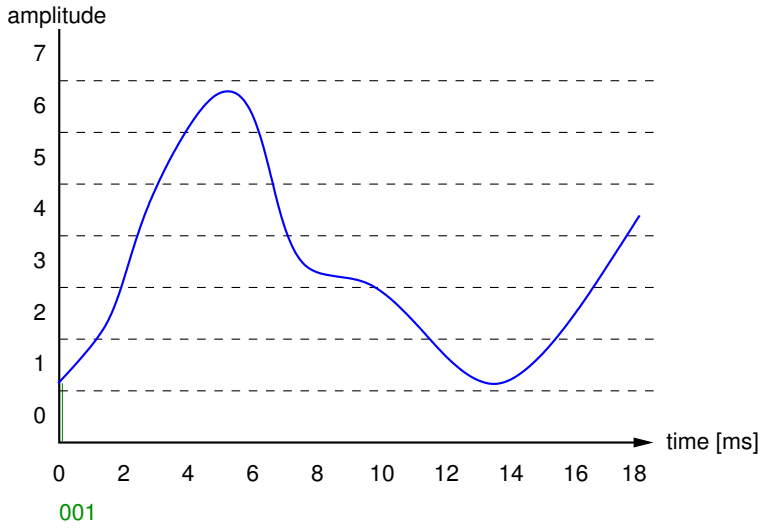
Input Analog Data



Case 1: 4ms Sampling Interval; 8 Levels



Case 1: 4ms Sampling Interval; 8 Levels



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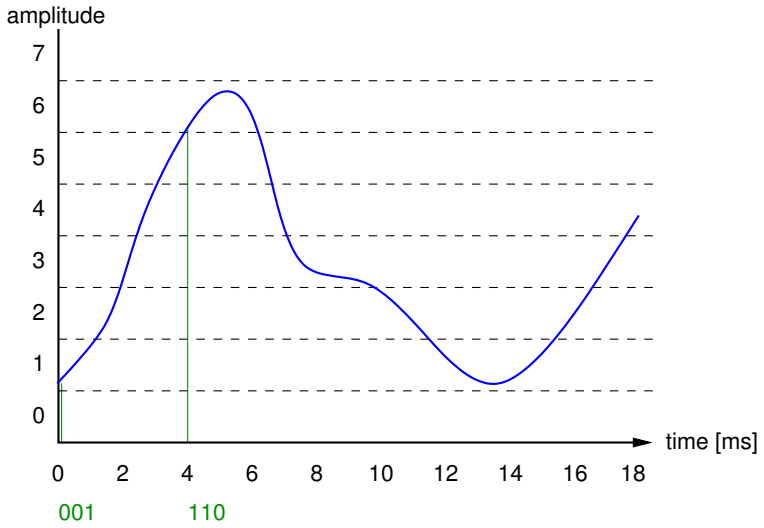
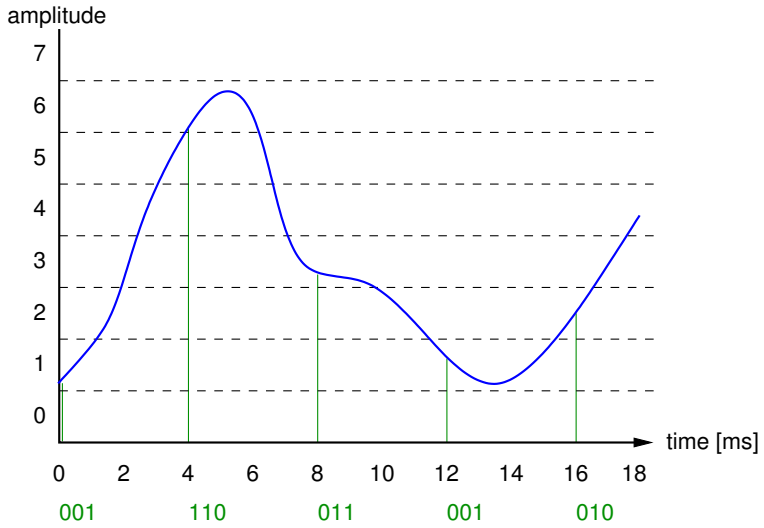
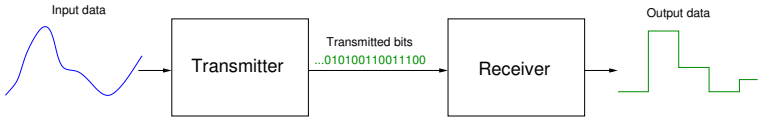


Case 1: 4ms Sampling Interval; 8 Levels



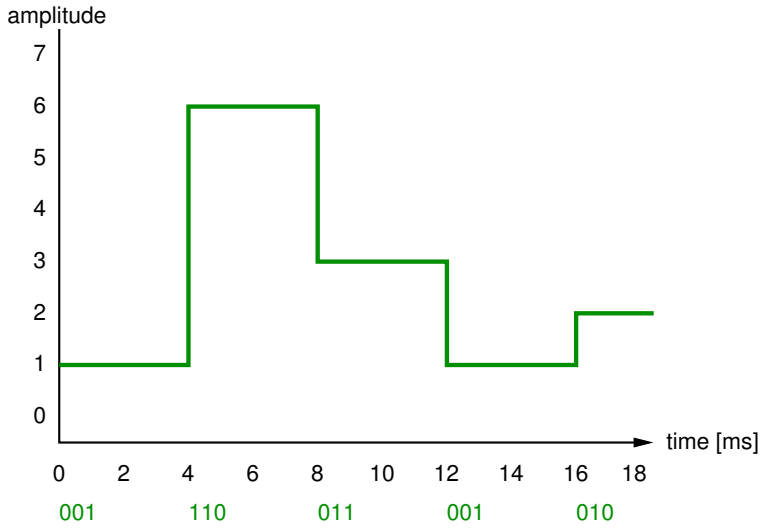
Case 1: Transmitting the Data



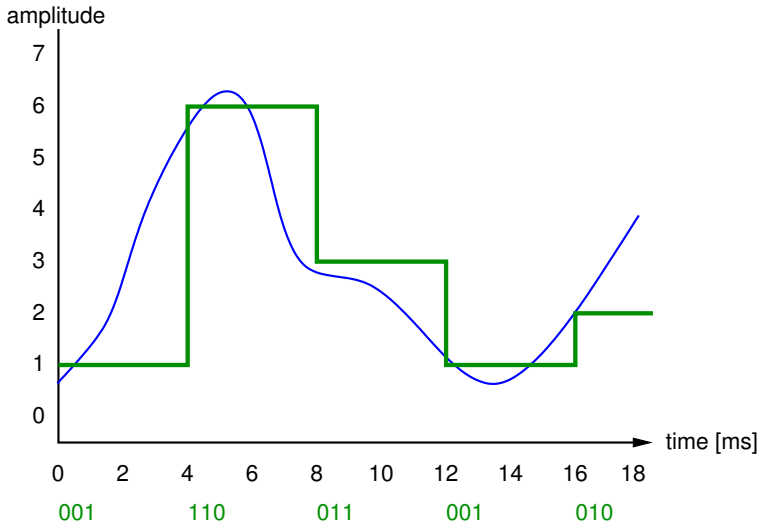
What Data Rate Is Required?

- 1 sample every 4ms
- 3 bits per sample
- 3 bits per 4ms = 750 bps

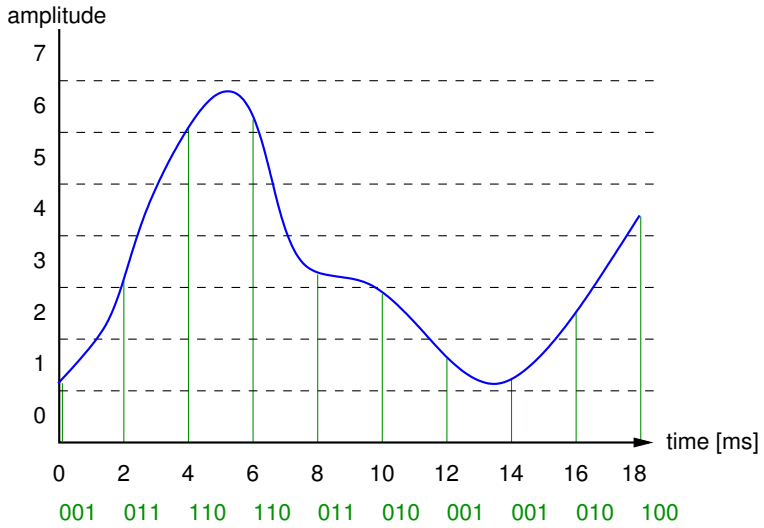
Case 1: Reproduced Data at Destination



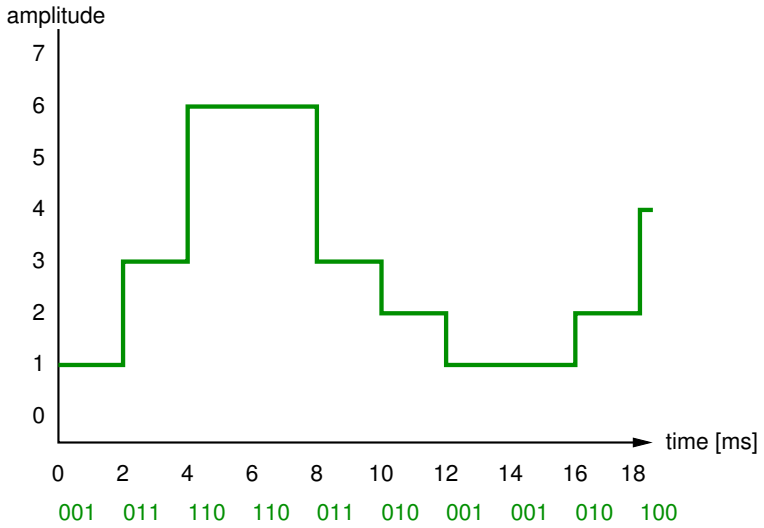
Case 1: Comparing Source and Destination Data



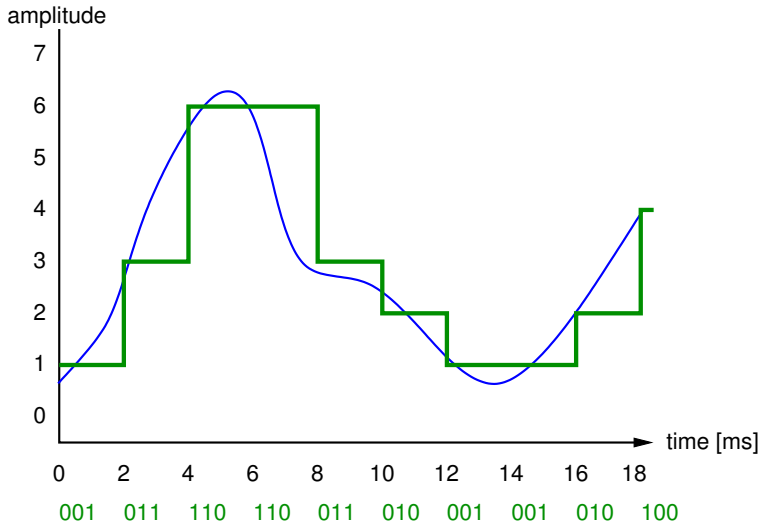
Case 2: 2ms Sampling Interval; 8 Levels



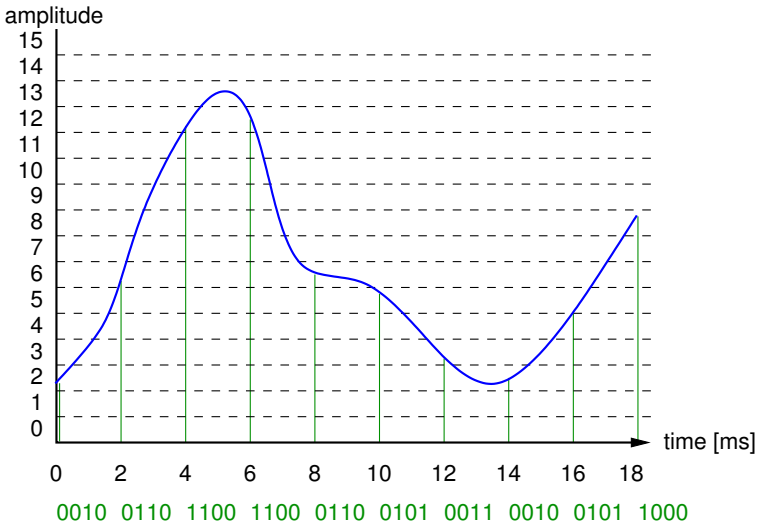
Case 2: Reproduced Data at Destination



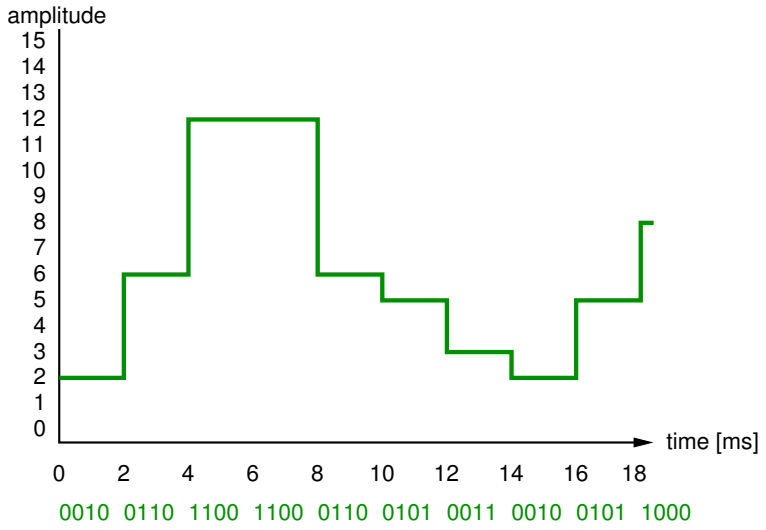
Case 2: Comparing Source and Destination Data



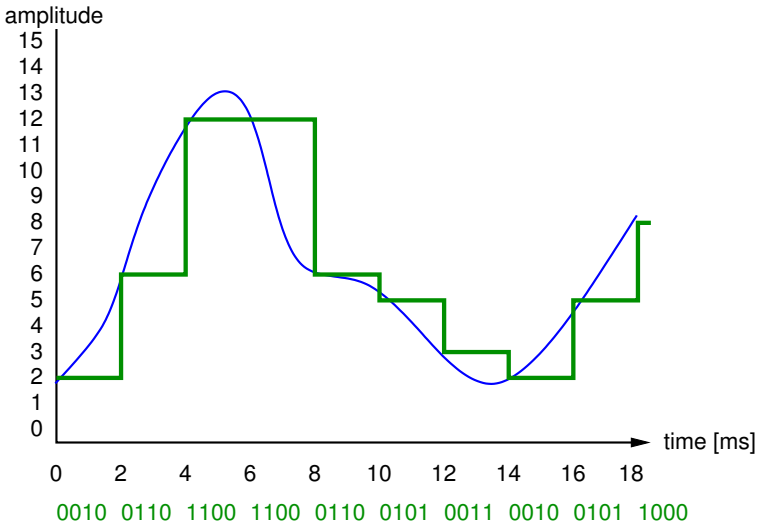
Case 3: 2ms Sampling Interval; 16 Levels



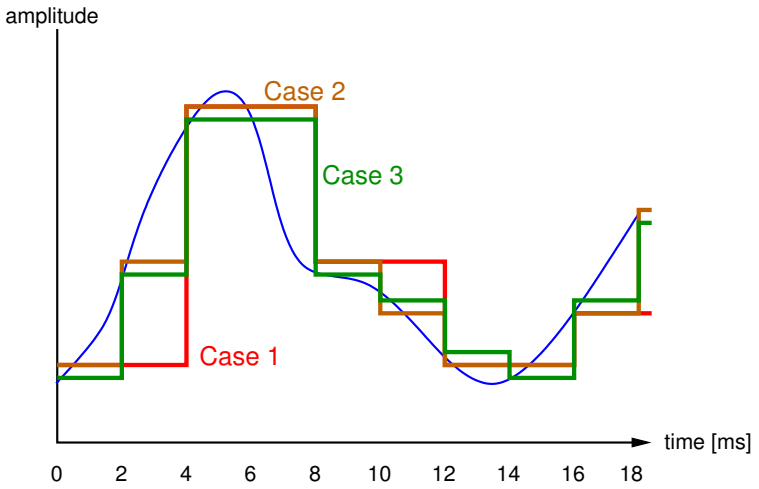
Case 3: Reproduced Data at Destination



Case 3: Comparing Source and Destination Data



Comparing All Cases



Tradeoffs

Accuracy of Reproduced Data at Receiver

- Increasing sampling and/or levels; increased accuracy
- Case 3 (and 2) are more accurate representation of original data than Case 1

Transmission Data Rate Requirements

- Increasing sampling and/or levels; increased data rate required to transmit bits
- Case 1: 750 b/s required
- Case 2: 1500 b/s required
- Case 3: 2000 b/s required