Contents

Chapter 1

Introduction

The need for communication is a human necessity. With the invention of telephony by A. G. Bell in 1876 [1], communication over long distances became possible for many people in the western world. Besides telephony the use of other services increased during the last couple of years. With the birth of the Internet and the possibility for sending text messages by electronic mail (email), people were able to communicate between continents and different time zones in a cheap and fast way. Also, sharing pictures, electronic documents, and files became easy and extremely fast compared to conventional mail. With the introduction of analog dial-in modems, Internet access became affordable for private households and the Internet experienced an apparently irresistible triumphal procession.

Our modern service society asks for always more complex communication systems. The transported amount of data grows exponentially. Globalization of markets requires quick and easy share of information. Handling and transportation of this digitally coded information becomes increasingly important. While in earlier days data was transported via a copper wire, since some decades optical glass fiber is used, at least for information transportation over long distances. The advantages of communication via glass fiber compared to copper wire can be easily seen in Table 1.1.

	Diameter [mm]	Weight [g/m]	Loss [dB/km]
Fiber	0.2	0.073	0.2-0.8 [a]
Coaxial cable	5	30-100	100-1500 [b]

[a] depending on the wavelength
[b] depending on the frequency

Table 1.1: Comparison of fiber with coaxial cable. Other advantages of optical fiber are flexibility and inertness against electromagnetic interference.