

A Review Paper on Performance of Cellonics

Jeenat Bano¹ Jai Prakash Mishra²

¹UG Student ²Assistant Professor

^{1,2}Department of Electronics & Communication Engineering

^{1,2}Vivekananda Institute of Technology-East

Abstract— This paper discusses the present communication technology of Cellonics. Cellonics Technologies is going to be new life to connection devices which let modem rate 1, 000 periods more rapidly than our found modem. It will be based upon the way biological cell phone material communicates jointly along with nonlinear dynamical approach (NDS). Nonlinear dynamical system (NDS) is going to be mathematical formulations required in order to simulate the cell replies and were utilized in building considering that the practice is nonlinear. In current technology ASCII uses a mixture of ones and zeros showing off a single page involving alphabet. Then the data sent over frequency cycle in order to its destination where it is actually then decoded. The original technology similarly utilizes carrier signals as being a reference which uses a lot of wave cycles before a fresh decoder can determine this specific bit value, whether the bit is really a one or maybe the zero, in order to translate that right somebody character. Telecommunication companies will clearly advantages from incredible rate, simplicity and robustness in this particular new technology.

Key words: Cellonics, NDS (Nonlinear dynamical system), BER

I. INTRODUCTION

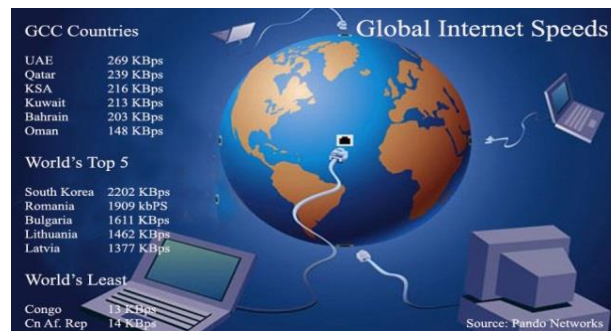


Fig. 1: Global Internet Speed

The term Cellonics is called “electronics cells”. By that technology any can access internet with high speed that customers have at any time dreamt involving. The Cellonics technology stands out as the essential modulation and demodulation procedure. It will be much more of great help for business to perform their work through distant using portable units. By introducing these kinds of technology will entirely create fundamental change inside method digital communication that has been followed traditionally. The Cellonics technology took place after studying biological mobile or portable behavior. The study showed in which human cells interact to be able to stimulate and generate waveforms that incorporate a continuous line connected with pulses separated by situations of science. This technology found approaches to mimic these pulse indicators and apply the crooks on the communications industry. The Cellonics element is going to take slow analog waveforms as input and sometimes produces predictable, digital details and sending it more than communication channels. This technology offers these devices with more rapidly, better, data for quite a long time. Cellonics also utilizes numerous discrete components, most which are bypassed or consume hardly any power. This reduces the amount of off the shelf parts in portable units while dramatically decreasing this electricity used, leading to a lower cost for the complete devices. With digital communication, Cellonics offers a fundamental change to just how modem solutions has sometimes been designed and developed. Cellonics technology introduces a good and swift Carrier – Rate Decoding solution about the receiving and decoding connected with modulated signal. It encodes together with decodes signals at one symbol per cycle. The Cellonics receiver utilized as devices that generate pulses through your received analog signal together with perform.

II. CELLONICS CIRCUITS

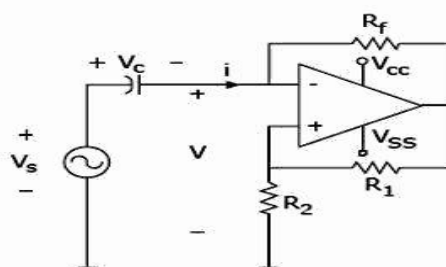


Fig. 2: Circuit Diagrams of Cellonics

Cellonics can be rolling out and patented groups of Cellonics circuits and this can be useful for various purposes. One of these Cellonics circuits is surely an extremely simple circuit during which exhibits the transfer high quality. The circuit contains a bad impedance converter. It can be I-V transport characteristics tend to be shown inside figure. The transfer characteristics include things like three different regions. Two regions when Op-Amp is operating through the saturated mode. The middle segment possesses negative slope.

III. PERFORMANCE OF CELLONICS

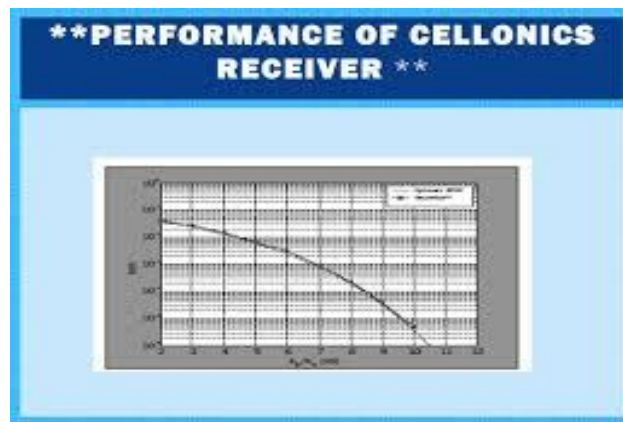


Fig. 3: Cellonics Receiver

A. BER Performance within a Narrowband Communication System:

An essential performance measure of almost any modulation scheme is their bit-error rate (BER) performance in just a noisy channel. Figure shows the numerical simulation link between the Cellonics receiver within the AWGN channel. Also shown within the figure is the theoretical curve from the optimal Binary Phase Alter Keying (BPSK) modulation system. From the figure, it can be clear how the BE performance on the Cellonics modulation can go with the theoretical optimum BPSK modulation structure.

B. BER Performance in an Ultra Wideband:

UWB generally is a new radio system where occupies an ultra-huge bandwidth. In UWB signaling, the transmission uses pretty short impulses of radio energy (less which have a practical a few nanoseconds throughout duration). This results within a new spectrum that covers a great deal of radio frequencies. Consequently, the chunk of transmitted energy is spread about the wide frequency range ultimately causing minuscule energy each Hertz. It'll cause little interference towards existing spectrum users. Typical correlation based UWB receiver requires numerous cycles and frames to order the signals and normal out the noise. The Cellonics technology can be utilized as a receiver to help you detect the UWB signs. The BER performance with the Cellonics UWB system is becoming evaluated in both simulations together with experiment.

IV. PROOF OF CONCEPT- DEMONSTRATION ON SYSTEMS

Within the following discussions, the parameters used within the demonstration systems like the distance of transmission and also the data rates are merely for simplicity of prototyping purposes and usually are not the limitation of the actual Cellonics technology.

A. Narrowband Connection System(wireline):

Using this system, a CD-ROM player becomes necessary as a handy signal source to own required little steady flow. The digital facts are modulated by using a pulse width modulation process. These modulated data in many cases are then passed through a 700-ft telephone wire line. At your receiver, the data is demodulated while using the "N-shaped" Cellonics routine, which in this sort of instance uses merely two aspects a fantastic inductor in series having a tunnel diode. To reestablish the digital information, deciding unit just counts your pulses to determine if it's a logic "1" or possibly "0". The recovered facts is then output a terrific audio player for real-time playback.

Note: This demo features good telephone long distance performance.

B. Narrowband Connection System (Wireless):

The system includes a transmitter and receiver; equally sub-systems further comprise a few modules: the PC/DSP factor, baseband transceiver module and also RF transmit/receive component. The DSP module resides in a personal computer while featuring a high-speed files transmission interface with all the transmit/receive PC. The DSP transmits the knowledge file residing around the PC serially for that baseband transmitter in a data rate regarding 26.7 Mbps. The baseband transmitter turns these data about the DSP into FSK-like waveforms. The RF receiver element down converts your received signal using an AM envelope detector. The received waveform is generally fed into the "S-shaped" Cellonics™ chip to get better the files. The recovered data are delivering on the DSP storage around your receiver PC. The transmission has little error correction scheme and also off-line BER check has zero error in many cases. The demonstration system shows a heightened throughput of data transfer which is 3 times faster when compared to a commercial Radio LAN item.

Note: This demo highlights superior to current wireless LAN (11 Mbps) operation.

C. Cellonics UWB Immediate Audio Radio System:

The product demonstrates your live tranny of cd music applying UWB Wi-Fi technology. Digital data from a set of CD-ROM players is tapped for under a price of 11. a few Mbps. This data stream is fed inside a UWB pulse generator in addition to transmit wirelessly. At your current receiver end, the signal is discovered then it fed around the Cellonics™ receiver to decode likewise the original music data is recovered/sent a good audio player for real-time playback a lot of.

D. Cellonics UWB Immediate Video Radio System:

For this method, a simple web camera should be used as the video acquire source. The digital video information is fed into a pulse position modulation handle board by using a USB connection before being frequency translated for a higher frequency band in a transmitter for sending above the oxygen. The airborne signals are then detected by way of a UWB receiver and pulse position demodulated here we are at digital video information for display in a video monitor. In both equally instances, an ultra-simple Cellonics Transmitter or even a simple Cellonics receiver employed. The speed of it is only limited from the Video camera's USB computer software data rate.

V. ADVANTAGES OF CELLONICS

A. New Life that you Communication Devices:

The strength inside the Cellonics technology lies within its inherent Carrier-rate Decoding, multilevel efficiency, simple circuitry, low electrical power consumption, and low charge

B. Saving on Chip/PCB Real estate investment:

Because of its straightforwardness, the receiver implemented having cellonics can certainly save approximately 4 periods the chip real-estate.

C. Saving On Power:

While using the some design and evaluation above, it was found in which Cellonics based receiver consumed thrice less power. This can be possible because a Cellonics circuits is established with a few discrete components which can be mostly passive and hence consume hardly any or negligible power.

D. Preserving In Implementation Occasion:

Within a receiver, the Cellonics circuit replaces many traditional subsystems just like the amplifier, mixer, PLL, oscillator, filtering etc. that are necessary inside the common super homodyne style.

E. Build or Renew your Products with Cellonics:

This kind of incredible simplicity, low sale price, low power consumption of Cellonics causes it to become ideal for use within your next generation of feature-rich products to be small in size as well as long on power e-book. Else, the technology is additionally ideal in giving your products a brand new low- price tag and also power-saving receiver power grows.

VI. CONCLUSION

The actual Cellonics verbal exchanges approach is one motivated through how biological tissue sign. It is a brand new and novel look how digital signals could possibly be conveyed. In this electronic era, it is appropriate; current digital communication designs are mostly caused by old analog signal approaches, with the Cellonics method, much of the subsystems within the traditional communication system will never be required. Noise generates along with power consuming systems as well as voltage controlled oscillator, PPLs, mixers, strength amplifiers, etc., are taken away.

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