Digital tv transmitter and receiver pdf

Home-produced BroadcastIng Solution Transmitters usually transmit more than one signal (TV channel) at a time. The transmitter modulates both the image and the sound into a single signal, and then sends it in a wide range, which should be received by the receiver (TV). NT-900 High-Performance Digital TV Transmitter Features: Industry-leading ultra-high efficiency, minimizing energy consumption system Original high-performance power amplifier patented technology is taken against the high PAR (Peak-average ratio) of digital television OFDM modulated signal, and transmitter efficiency above 35%; High linearity, providing quality amplification of the signal. In addition to increasing the efficiency of the power amplifier, the original high-performance power amplifier of patented technology also minimizes the nonlineaper and PAR compression of the power amplifier. This product provides an adaptive digital pre-correction function that provides leverage and MER output higher than system requirements. High reliability, simple maintenance to provide low cost maintenance of the system. This product takes the industry's leading solid-food components to LDMOS, with the option of anti 10:1 VSWR and -6V voltage gate. The main functional modules, including power amplifier, power supplies and monitoring, adopt a modular plug-in design that provides simple and fast maintenance, and reduce maintenance costs. Flexible access, full functions applicable to different monitoring networks. Adopts an advanced monitoring system, provides independent detection of parameters and protection for each functional module. This product also provides interfaces of RS232, RS485, TCP/IP protocols for various monitoring networks. Small size, low noise. This product uses 19 standard cabinet design, small size, easy to install. System noise at 5dB is lower than the traditional transmitter due to reduced energy consumption. Настраиваемый для DVB-T/T2, ISDB-T, ATSC и т.д. Основные характеристики (для CMMB): Диапазон частот 470 МГц 860 МГц Канал Пропускная способность 8 МГц Эффективная пропускная способность канала 7,512 МГц Частота регулируемый шаг MFN режим ≤1KHz SFN режим ≤1 Гц стабильность частоты (3 месяца) Внутренняя ссылка ≤1-10-7 (3 месяца) Внешняя ссылка ≤10-10 (3 месяца) Точность частоты MFN режим ±100 Гц SFN режим ±1 Гц Фазовой шум 1KHz ≤-85dBc/Hz 10KHz ≤-95dBc/Hz 10KHz 100 КГц ≤-110dBc/Hz RF Мощность (24 часа) ≤±0,3 дБ Отражение Потеря выходной нагрузки Нормальная эксплуатация: ≥26dB Разрешить операцию: ≥20dB плечо Соотношение ≤-36dBc Модуляция Коэффициент модуляции ≥ ≥32dB Peak-average ratio (PAR) ≥7.5dB @CCDF 0.01%, and comply with the CCDF mask requirement Of Ripple In Band ≤±0.5dB Auto Level Control (ALC) ≥10dB Out of the Range of False Emissions Output in the nearby Channel than the working channel in the signal range of 45dB, and below 13 mW the stray output from the adjacent channel is lower than the working channel in the power signal range of 60dB, and lower than 13 mW Time Lat delay adjustable range (SFN) 0s'4s Time delayed adjustable step (SFN) 100ns Operation temperature 0 '40' C Efficiency ≥35% Power AC220 In ± 10% Power Output 100W 300W 500W 1KW Dimensions Standard 19-inch Cabinet 3U 12U 16U 32U Why High Performance Digital TV Transmitter? (Take as an example a transmitter 1 kW) Item Traditional transmitter High-efficient transmitter Energy Improvement 7KW zlt;3KW'gt;57% Measuring Standard 19 cabinet, 37U Standard 19 Cabinet, 32U 13.5% Noise 65dB 60dB 7.5% Product Photo NT-800 All-in-One High Efficiency Digital Tv Transmitter Features: High Integration Design, Compact Transmitter Integrates GPS, ASI-IP Converter and Excitor. High linearity, providing quality coverage --Good linearity to international level, with shoulder ratio up to 38dB and MER at least 35dB; --Advanced digital pre-distortion technology, effective improvement in the linearity of the transmitter High reliability and stability with low failure rate --Global advanced components of LDMOS to implement a fully durable and modular design; --Redundancy design in power supply and transmitter amplifier, higher reliability; --Take a self-optical state control amplifier, provides good temperature adaptability for power amplifiers; - Support for both manual level control (MLC) and automatic level control (ALC) to achieve stable power; -- Advanced alarm and protection features that can protect the transmitter no more when peripheral equipment is faulty; Easy to maintain with a user-friendly interface and flexible monitoring mode --Intuitive GUI provides simple and easy control of transmitters. A large touchscreen human-machine interface, intuitive and easy to operate; --Optional SNMP, remote TCP/IP interface and standard parallel remote control interface facilitate remote control and monitoring Flexible configurations make it easier to install. --Frequency covering the entire UHF group; --Multi-support modes such as DVB-T/H, DAB, DMB-T/H, ISDB-TB, ATSC, ATSC mobile, CTTB and CMMB; --Compact conformation with a standard structure of 19 2U, Easy-to-install Specifications: RF Specs Frequency Range 470 MHz 860 MHz Maximum Power Output 100W Leverage Ratio (central frequency ±3.2 MHz) ≤ -38 dB frequency adjustable step MFN ≤1 Hz SFN ≤1 Hz Frequency stability of internal links ≤1'10-7 (3 months) (3 months) external link ≤1'10-10 (3 months)) Accuracy frequency MFN mode ≤±100 Hz SFN ≤±1 Hz Phase Noise 1KHz ≤-85dBc/Hz 10KHz ≤-95dBc/Hz 100 KHz ≤-110dBc/Hz RF Power (24 Hours) ≤±0.5 dB Out of the range of false emissions Of Stray's Exit in the adjacent channel below, than a working channel in the signal range of the zlt;/3KW'gt; 45dB, and lower than 13mW Stray exit from adjacent channels lower than the working channel in the power signal range of 60dB, and below, than 13 mW Spectrum Mask meets the requirements of the ABNR Mask Ripple In Band (fc ±3.0 MHz) ≤±0.5dB Modulation Error Ratio (MER) ≥35dB Time Delay Adjustable Range (SFN) 0s'4s Delayed Adjustable Step (SFN) 100ns Interface Data Entry ASI, BNC 75 / IP, IP, RJ45 RF Monitoring Exit SMA 50 RF Exit 7/16 50 Remote Control Wireless Modem or Via Internet Environmental Factors Exploitation Temperature 500 ' 45'C Relative Humidity (non-condensation) Atmospheric Pressure 86'106Kpa Power 1 10-220V ± 10%, 50 Hz Dimensions 482 mm (W) x 540 mm (D) x 132 mm (H) Max. Weight 20 kg Cabinet: NT-700 Digital TV Transmitter Features: High Efficiency and Low Operating Costs; Efficiency up to 30%, energy consumption below 3.3 kW; High reliability and stability at low bounce levels; -Global advanced components of LDMOS to implement a fully solid and modular design; - Redundancy design in power supply and transmitter amplifier, higher reliability; Support for both manual control of the level of control (MLC) and automatic level control (ALC) to achieve stable power; -Auto-protective functions for feeding against thunder, phase absence, excessive voltage and excessive current; - Advanced alarm and protection features that can protect the transmitter no more when the peripheral equipment is faulty; -Power and amplifier support hot fork and reproduction, allowing replacement while working, very convenient to work; Easy to maintain with a user-friendly interface and flexible monitoring mode; -Intuitive GUI provides simple and easy control of transmitters. A large touchscreen human-machine interface, intuitive and easy to operate; -Additional SNMP, remote TCP/IP interface and standard parallel remote control interface facilitate remote control and monitoring; Flexible configurations make it easier to install; Frequency covering the entire UHF group; -Multi-support modes such as DVB-T/H, DAB, DMB-T/H, ISDB-TB, ATSC, ATSC mobile, CTTB and CMMB; -Flexible configuration for amplifier units, allowing you to reduce and add units as required. -Compact Conformation and Small Size Specification: NT-700 Digital TV Transmitter Specs Frequency Range 470-860 MHz Shoulder Ratio (Central Frequency ±4.2 MHz) ≤ -38 dB Modulation Error Ratio (MER) ≥ 3 3 dB Ripple In Band (fc ±3.756 MHz) ±0.5 dB Phase Noise 1KHz qlt; -90 10 KHz -110 100 KHz qlt; -120 Power Supply AC 380V ± 10% Cabinet Standard 19 Overall Efficiency 〉30% Ambient Temperature 0 x C-45 C Models: Product Type Model 1KW NT-700 TV transmitter NT-700-1kW 500W NT-700 Digital TELEVISION transmitter NT-700-500W 300W NT-700 Digital television transmitter NT-700-300W Product Photo: TV transmitter is a transmitter that is used for terrestrial (over-air) television television It is an electronic device that emits radio waves that carry a video signal representing moving images, along with a synchronized audio channel that receives television receivers (TVs or TVs) belonging to the public audience that display the image on the screen. The television transmitter, together with the broadcasting studio that originates, is called a television station. Television transmitters must be licensed by governments and limited to a certain frequency channel and power level. They are transmitted through frequency channels in the VHF and UHF ranges. Because these frequencies are stretched in line of sight, they are limited to a horizon of 40-60 miles, depending on the station transmitter height. Television transmitters use one of two different technologies: analog, in which image and sound are transmitted by analog signals modulated on a radio-broadcast wave, and digital, in which image and sound are transmitted by digital signals. The original television technology, analog television, began to be replaced in a transition period starting in 2006 in many countries with digital television (DTV) systems. They transmit images in a new format called HDTV (high definition television), which has a higher resolution and a wider screen ratio than analogue. DTV makes better use of the meagre bandwidth of the radio frequency spectrum, as multiple DTV channels can be transmitted in the same bandwidth as one analogue channel. In both analog and digital television, different countries use several incompatible modulation standards to add video and beeps to the radio wave. The principles of analog systems are summed up primarily because they tend to be more complex than digital transmitters due to the multiplexing of the VSB and FM modulation stages. Types of transmitters There are many types of transmitters depending on the system of standard power Power Reserve power facility, usually a modulator, multiplexer and power amplifier stereophonic (or dual sound) object, for analog television systems Aural and visual power combining the main, for analog television systems Active network element in the final stage of the amplifier System Standard Main article: Television station, Karaman, Turkey International Plan , which is commonly known as the Stockholm Plan (1961) defines the standards used in broadcasting. In this regard, the most important figures for transmitters are radio frequencies, the separation of frequencies between auditory and visual media and the width of the band. The input stage of the Audio Transmitter (AF) input (or inputs in the event of broadcast) is usually a signal with a maximum bandwidth of 15 kHz and a maximum level of 0 dBM. The preemphase of constant time is 50. Signal after passing buffer applied to the modulator, where it modulates the Intermediate Frequency Media (IF). Modulation technique is usually frequency modulation (FM) with a typical maximum deviation of 50 kHz (for 1 kHz. input at 0 dBM). Video input (VF) is a composite video signal (video synchronization information) a maximum of 1 volt by 75 Ω is not. (1 V limit for brightness signal. After the buffer and 1 V chain clipping, the signal is applied to the modulator, where it modulates the intermediate frequency signal (which is different from that used for the auditory signal.) The amplitude modulator modulator that modulates the IF signal in a way where 1 V VF corresponds to a low IF level and 0 volts of VF corresponds to a high IF level. The AM modulator produces two symmetrical side strips in modulated signals. Thus, the width of the IF band is twice the width of the video range. (i.e., if VF is 4.2 MHz, IF bandwidth is 8.4 MHz.) However, the modulator is accompanied by a special filter known as the Westsgal side lane filter (VSB). This filter is used to suppress part of one side strip, so the bandwidth decreases. (Because both side bands contain identical information, this suppression does not cause loss of information.) Although suppression causes phase delay problems, the VSB phase also includes correction circuits to equalize the phase. The output stages of the modulated signal are applied to the mixer (also known as the frequency converter). Another input is the mixer, which is usually produced in a crystal furnace oscillator known as a subcarrier. The two outputs of the mixer are the amount and the difference of two signals. An unwanted signal (usually the amount) is filtered out, and the remaining signal is a radio frequency (RD) signal. The signal is then applied to the amplifier stages. The number of amplifiers in the series depends on the required power. The final stage is usually an amplifier consisting of many parallel power transistors. But in old transmitters tetrods or klystrons are also used. In modern VHF and UHF solid transmitters, LDMOS transistors are the device of choice for the output stage, with the latest products using 50V LDMOS devices for higher efficiency and power density. Even higher energy efficiency is possible with envelope tracking, which in the ether industry is often referred to as drain modulation. The combination of auditory and visual cues there are two methods: Split Sound System: In fact, there are two parallel transmitters one for auditory and one for visual signal. These two signals are combined at the exit with a high-power combine. In addition to the combine, this system requires a separate mixer and for auditory and visual signals. It's a system used in most high-power applications. TV transmitter block diagram (intercarrier method). intercarrier). System : There are two phases of entering one for AF and one for VF. But these two signals are combined in low power if the circuits (i.e. after the modulators) mixer and amplifiers are common to both signals and the system does not need high power combiners. Thus, both the price of the transmitter and the energy consumption are much lower than the price of a split-sound system of the same power level. But the two signals passing through the amplifiers produce some product intermodulation. Thus, the inter-career system is not suitable for high power applications, and even at lower power transmitters at the output, a notch filter should be used to deflect cross-modulation products. Power Output See also: The power output of the analog TV transmitter output is defined as power during the signal synchronization of the pulse. (The real output power is variable depending on the content.) But the power output of the transmitting equipment and the power output of the antenna in two different quantities. The power output antenna is known as the ERP, which is actually a transmitter once the antenna's energy amplification. See also Amplitude Modulation Broadcast Relay Station Broadcasting Television Systems Differential get Differential Phase Intercarrier Method Studio / Transmitter Link (STL) Transmitter/Studio Link (TSL) Transmitter Station Transposer Links - Analog Television Broadcasting Systems by Paul Schleeter Further Reading Bernard Coffin, Charles E. Herndon: Television and Video System, Glencoe McGraw-Hill Background for Radio Engineers, Chapter 30, Howard W.Sams Co Inc., Indianapolis,1977, ISBN 0-672-21218-8 FARWAY IRFC, TV and Radio Transmissions, Radio Data Systems, BroadcastIng Technologies, Extracted from digital tv transmitter and receiver block diagram. wireless digital tv transmitter and receiver