Operational Description

CT2440ARINC 11.2461.200

Release 1v0
27.08.10/CR

General Information on D-ENG (Digital Electronic News Gathering)

The introduction of the DVB standard established the basis for digital broadcast video transmission making efficient use of the available bandwidth. Powerful compression algorithms allow a reduction in the amount of data to be transferred, while maintaining the high quality standards for video and audio signals used in broadcasting applications. New modulation techniques and error correction algorithms ensure a secure signal transmission even when the transmission conditions are poor.
The DVB-T standard was established for terrestrial digital TV broadcasting, in particular considering the difficult conditions of radio transmission. The highly efficient OFDM multicarrier modulation procedure enables transmission without interference even under multipath propagation conditions occurring with non-directional transmission or reception. Practical experience soon has proved that the DVB-T standard guarantees ruggedness of transmission to an extent even allowing mobile reception.
Increasing miniaturization, in particular of MPEG encoders and OFDM modulators, enables using the DVB-T standard for mobile portable transmission systems.
Previous analog FM systems were adversely affected by signal reflections directly resulting in video and audio interferences. Such effects do not occur when the digital ENG system (D-ENG) is deployed. Even mobile transmission from moving vehicles or the use of omni-directional antennas on the transmitting or receiving side does not impair the picture or sound quality at all, opening a completely new range of applications in TV production and news gathering.

Brief Description

The transmitter CT2440ARINC allows using any SDI or HD-SDI camera with analogue audio input in a wireless environment. HD-SDI is an industrial standard.

The video is taken from the camera by an (HD)-SDI-Interface (Encoder board). Analogue Audio from the camera is converted to digital data and packed with the SDI video data to an ASI format.

Before modulation processing the packets are restamped and filled up to a constant data rate with stuff packets. The modulator is a COFDM modulator related to EN 300744 (ASI Modulator board 20.1492.011). The profile is 2k. The input stage auto detects the incoming data rate.

OFDM (Orthogonal Frequency Division Multiplex) Modulation

The digital data signal for wireless transmission is processed by the OFDM Modulator and following IQ Modulator. The OFDM modulation procedure has a major impact on the transmission properties and was specifically developed for terrestrial radio transmission.
The transmitter follows the DVB-T standard (only at a higher frequency). The 2k mode is choosen for this kind of transmitters in 8MHz bandwidth. Details please find in ETS 300 744.

This digital signal is converted in the next stage to analogue differential IQ values (two individual paths with 90° phase shift). The IQ-modulator (20.1448.011) converts the analogue baseband information direct into the RF domain at 2.450-2.483,5 GHz. The frequency is controlled by a PLL. The output power is around 1mW (0dBm). A power amplifier boost this signal to 5W/10W (37/40 dBm).

Linear Power Amplifier

The linear power amplifier amplifies the output signal of the Modulator to an output of about 5W (+37 dBm) / 10W (+40) dBm). The output port is located on top of the device. The power amplifier has an ALC which guarantees constant output level. The energy is transmitted by an antenna to the corresponding receiver.

Crestfactor and Output Power

Due to the high efficient digital modulation within COFDM (ETS 300 744) there is a reasonable difference between average and peak power of the device. This so called Crest Factor is a statistical phenomenon. The transmitter has no clipping mechanism which limits (and corrupts) the outgoing signal. Typical assumption is a Crest-Factor of 10-12 dB at a probability of 10E-4. Several application notes explain this in detail, for example 7TS02_2D.pdf from Rhode&Schwarz.

In all our datasheets the average power is given. This is measured with a thermal measurement head and a power meter. The average power is the only value which could be measured without any statistical influence and allows comparing systems.

RF Connector

The RF output signal of the Low-Power Amplifier is fed out at the N(f) connector on the transmitter front.
The CT2440ARINC provides RF output of about 5W/10W (+37dBm/40dBm).

Connecting Signal Sources

The Video signal supplied by the camera has to be applied to the SDI BNC(f) connector of the transmitter.
The Audio signal supplied by the camera has to be applied to the Audio in Amphenol 91 569783 35P connector of the transmitter.

Connecting the RF Output

An omni directional antenna with N(m) cable can be connected at the RF out socket.

Connecting the 28VDC Supply Voltage

28VDC; 7Amin.; P < 200W

User interface

With the HCP50 control panel or an RS232 Terminal you can change frequency or pre defined presets, output power, scrambling, Modulation, Video input.

Technical Specifications

Frequency	2450 – 2483,5 MHz
Video Input	SD/HD SDI - BNC(f) CVBS - BNC(f) (PAL and NTSC)
Audio Input	1x Analogue audio pair in (Line or Mic Level) – Amphenol 91 569783 35P
Modulator	COFDM, ETS 300744, 2k carriers Bandwidth: 8 MHz QPSK,16 QAM,64 QAM
RF Output Power	5/10 W
Power Input	28 VDC
Power Consumption	<200W
Operating Conditions	Ambient temperature -10℃ to +48℃
Dimensions over all (W x D x H)	216 mm x 124 mm x 250 mm
Weight	5.5 kg approx

The CT2440ARINC 11.2461.200 can be set from 2450MHz up to 2483,5MHz. in steps of 1MHz with a signal bandwidth of 6, 7 or 8 MHz.