Digital Fibre Optic Transmission System for SDI / Analogue Video and Audio Signals Uncompressed Broadcast Quality

DRAC 3000

- SDI or analogue video broadcast.
- Multiple 4 SDI or 8 analogue video channels (DRAC 3000).
- Multiple 24 analogue audio channels.
- Uncompressed 10-bits digital video
- Uncompressed 20-bits digital audio
- Digital repeatable.
- Undirectional and bidirectional DWDM system.
- Upgradable through DWDM up to 256 analog or 128 SDI video,1536 audio and 96 E1 channels.
- Accepts 6 E1 (6 x 2 Mbps) channels (DATA 3000)
- Easy modular configuration.
- Easy field maintenance.
- PAL, SECAM, NTSC, even SCRAMBLED.

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DRAC 3000 was awarded with the Salvà i Campillo prize, V Telecommunications Night 2000

SYSTEM DESCRIPTION

BASIC SYSTEM

DRAC 3000 is a complete optical fibre transceiver system for transmission of multiple high quality TV (uncompressed video and audio) and data signals. In the transmitter, the analogue-to-digital (A/D) modules convert the analogue input signals to digital format, using 10-bit quantization for the video and 20-bit quantization for the audio. Data signals and the uncompressed video and audio are time division multiplexed (TDM).

Single-mode optical fibre transmission is achieved with a directly intensity modulated DFB laser as a transmiter, which is compliant with International Telecommunications Union (ITU) standards concerning Wavelengtn Division Multiplexing (WDM). In the receiver, the photodetection stage is done by an avalanche photodetector (APD) which allows for a high sensitivity, followed by a demultiplexer module and, for the analogue video, digital-to-analogue converter (D/A) modules.

DRAC 3000 has a capacity that allows simultaneous transmission of 4 SDI or 8 analogue video broadcast channels, 24 audio channels (broadcast quality). 6 E1 (2 Mbps) data channels and 1 telemetry/monitoring channel resulting in a digital frame of 1.46 Gbps.

Distances longer than 100 km with standard optical fibres using the third window (1550 nm) are attained thanks to high power laser transmitter and high sensitivity of APD optical receiver. For longer distances it is necessary to use Optical Fibre Amplifiers.

Because transmission signal is digital, there is no degradation over long distances or through multiple signal repeats.
Local status and alarm monitoring is easily accomplished with front panel LED's and LCD display, or remotely monitored via rear panel connectors. System control and status / alarm monitoring can be done locally.

DRAC 3000 has 2 racks that consist of the modules listed next:

The transmitter (mechanical mounting in 19" rack of 6 U) has the following modules:

- *2 modules with two SDI or four analogue video input ports each.*
- *4 modules of A/D audio converters, with six analogue input ports each.*
- *1 module with the multiplexer and serializer.*
- *1 module with DFB transmitter laser.*

The receiver (mechanical mounting in 19" rack of 6 U) has the following modules:

- *1 module with APD photodetector receiver (RS-422 port included.*
- *1 module with the demultiplexer and deserializer.*
- *2 modules with two SDI or four analogue video output ports each.*
- *4 modules of D/A audio converters, with six analogue output port each.*

The rack-mount chasis include the power supply.
DATA 3000 is a compact 1U rack-mount unit that provides interface between DRAC 3000 and 6 E1 channels (6 x 2 Mbps).

WDM SYSTEM (NxDRAC 3000)

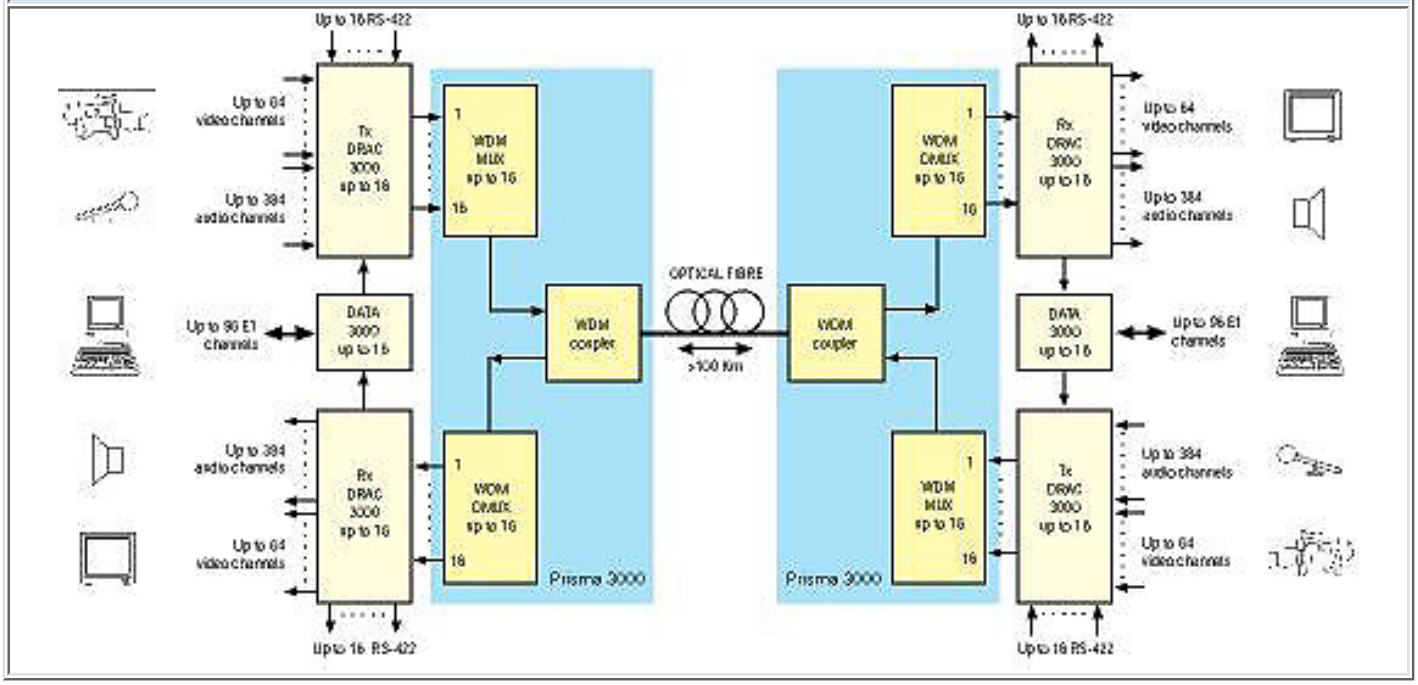
Today the most efficient way of increasing a fibre capacity is to use Wavelength Division Multiplexing which is the basic technique to introduce multiple and independent optical channels into a single optical fibre. This is achieved by assigning one different wavelength to each basic transmission system. In this way we can increase by a factor of N the transport capacity of the DRAC 3000, where N is the number of used wavelengths.

Now, the commercially available WDM systems over a single fibre are:

-An unidirectional N x DRAC 3000 system where N can be up to 64 (optical channels), which in a near future will reach 128 optical channels.

-A bidirectional N x DRAC 3000 system. where N can be up to 32 (optical channels in each direction), which in a near future will reach 64 optical channels in each direction.

BLOCK DIAGRAM OF BIDIRECTIONAL 16 X DRAC 3000



S P E C I F I C A T I O N S

Video Channels
Conectors: BNC.
Active video detector

Digital Video
Input /output : SDI (CCIR 601)
Resolution: uncompressed 10 bits
Input/Output Signal: 0,8 Vpp
Input Impedance: 75 Ω unbalanced
Output Impedance: 75 Ω unbalanced

AnaIogue Video
Input/Output Signal: analogue composite (1 Vpp).
Input Impedance: 75 Ω unbalanced /loopthrough.
Output Impedance: 75 Ω unbalanced /loopthrough.
Analogue Bandwidth: 7 MHz.
Sampling frequency: 27 MHz.
Resolution: 10 bits, linear, no compression.
Differential Gain: < 1.2%
Differential Phase: < 0.5%
K2T: <0.8%
S/R Ratio: > 62 dB

Audio Channels
Input Signal: analogue.
Output Signal: analogue and digital AES/EBU.
Input Impedance: 10 KΩ balanced, transformer isolated.
Output Impedance: 50 Ω balanced.
Analogue Bandwidth: > 20 KHz.

Sampling Frequency: 48 KHz.
Resolution: 20 bits, linear, no compression.
Analogue Output Level Adjust: ± 6 dB.
Digital Processing: AES/EBU.
THD+N: ≥ 90 dB.
Connectors: Phoenix (analogue signal) and SUB D 9 pin (digital AES/EBU signal).

Environmental

Mechanical Mounting in 19'' rack of 6U.
Primary Power: 110/220/240 VAC, optional - 48 VDC.
Power Consumption: 175 W.
Linear power supply
Weight: 21 Kg.

Optical (DRAC 3000)

DFB Laser Output Power: 3 dBm (power and temperature controlled).
Optical Connector: FC/PC (other optical connectors such as SC and E-2000 are available).
Fibre: standard single-mode.
Wavelength: 1550 nm (1310 nm optional).
Link Budget: > 33 dB (with APD).
Link Budget: > 24 dB (with PIN).Bit Rate: 1,46 Gbps.
Input Optical Power Monitoring at the receiver.
Uncompressed 4 x SDI or 8 x Analogue Video Channels
Uncompressed Audio Channels: 24
Data Channels: 6 E1 (2.048 Mbps), BER<10^{-10}, with DATA 3000 (connectors V35).

MAIN WDM DRAC 3000 CHARACTERISTICS

DFB Laser Output Power: 3 dBm (100 GHz. or 0,8 nm. ITU wavelength spacing).
Maximum Number of Optical Channels: 64 unidirectionals or 32 bidirectionals*.
Capacity of each Optical Channel: DRAC 3000
Link Budget: > 25 dB (Bidirectional 8 x DRAC 3000).
(*) In a near future this capacity will be increased to 128 unidirectionals or 64 bidirectionals.

TVC Technologies reserves the right to improve and modify the features and specifications of products without prior notification.

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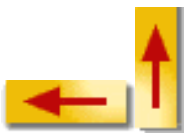

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