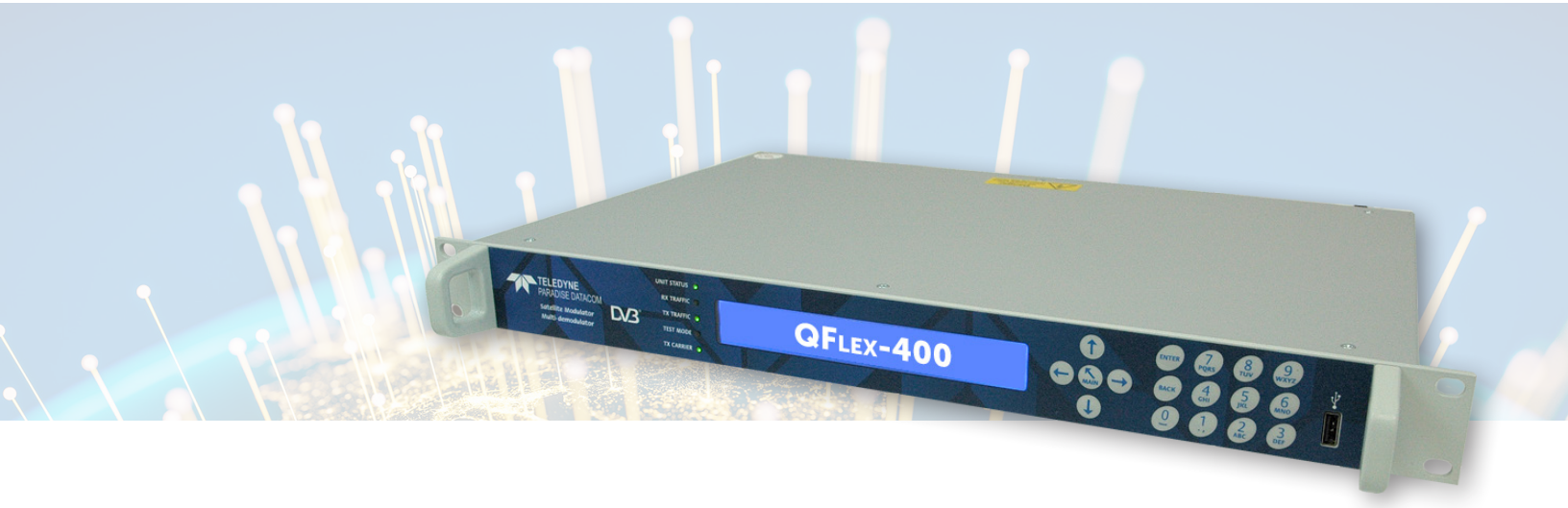
Glossary of Terms



Making Sense of the Alphabet Soup of Technical Abbreviations and Acronyms

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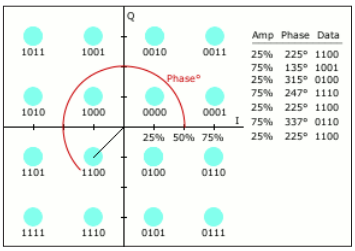
Abbreviations De-mystified

16QAM – Sixteen Quadrature Amplitude Modulation

Quadrature amplitude modulation conveys two analog message signals, or two digital bit streams, by modulating the amplitudes of two carrier waves. The two carrier waves of the same frequency are out of phase with each other by 90 degrees, a condition known as orthogonality or quadrature. The transmitted signal is created by adding the two carrier waves together. 16QAM is displayed in a square grid with 16 constellation points with equal vertical and horizontal spacing.



ACM – Adaptive Coding and Modulation

ACM or Adaptive Coding and Modulation is a technology which can automatically change the forward error correction and modulation of a link to compensate for changes in link conditions. Commonly these changes are due to weather, e.g. rain fade, but can also come from other sources such as RF level changes or interference.

ADPCM – Adaptive Differential Pulse Code Modulation

This modulation scheme is a variant of differential pulse-code modulation (DPCM) that varies the size of the quantization step, to allow further reduction of the required data bandwidth for a given signal-to-noise ratio.

AGC – Automatic Gain Control

A feedback regulating circuit in an amplifier or chain of amplifiers, the purpose of which is to maintain a suitable signal amplitude at its output, despite variation of the signal amplitude at the input.

AUPC – Automatic Uplink Power Control

Technology available on high-end satellite modems for adjusting the output power to maintain a constant signal to noise ratio at the remote end.

BER – Bit Error Rate

The number of bit errors divided by the total number of transferred bits during a studied time interval. The number of received bits of a data stream over a communication channel that have been altered due to noise, interference, distortion or bit synchronization errors.

BERT – Bit Error Rate Test

BERT or bit error rate test is a testing method for digital communication circuits that uses predetermined stress patterns consisting of a sequence of logical ones and zeros generated by a test pattern generator. A BERT typically consists of a test pattern generator and a receiver that can be set to the same pattern.

BUC – Block Up Converter

A block up converter (BUC) is used to transmit signals to satellites. It converts a low IF frequency signal to higher frequencies for transmission to a satellite. In addition to up converting the frequency, they also amplify the signals.

Abbreviations De-mystified

CAS – Channel Associated Signaling

A form of digital communication signaling which uses routing information to direct the payload of voice or data to its destination. This routing information is encoded and transmitted in the same channel as the payload itself.

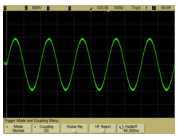
CCSDS – Consultative Committee for Space Data Systems

Founded in 1982 for governmental and quasi-governmental space agencies to discuss and develop standards for space data and information systems. Developed data standards and information system frameworks covering a variety of areas including data creation, transmission, management, and preservation as well as the systems supporting that data.

CRC – Cyclic Redundancy Check

An error-detecting code commonly used in digital networks and storage devices to detect accidental changes to raw data. Blocks of data entering these systems get a short check value attached, based on the remainder of a polynomial division of their contents. On retrieval, the calculation is repeated and, in the event the check values do not match, corrective action can be taken against data corruption.

CW – Continuous Wave



An electromagnetic wave of constant amplitude and frequency, typically a sine wave, that for mathematical analysis is considered to be of infinite duration.

DSCP – Differentiated Services Code Point

A 6-bit value in an IP header used for packet classification purposes. Part of the Differentiated Services computer networking architecture that specifies a simple and scalable mechanism for classifying and managing network traffic and providing quality of service on modern IP networks.

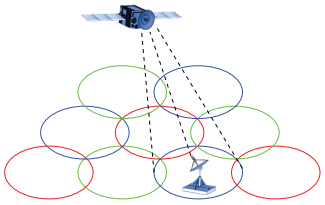
ESC – Engineering Services Channel

Provides a secondary communications channel, often used for monitor and control of remote equipment.

FEC – Forward Error Correction

A technique used for controlling errors in data transmission over unreliable or noisy communication channels.

HTS – High-Throughput Satellite



HTS uses spot beam technology, which is multiple narrow transmission beams (point-to-multipoint), that allows the re-use of a frequency band and provide better spectral efficiency and support higher transmission speeds.

IBS – Intelsat Business Services

IBS is designed for communication between IESS A, B, C, E and F earth stations, which may function as national or urban gateways and/or as customer-premise installations. Not intended to be used for public switched telephony. IBS networks can be operated in either Open or Closed Network configuration.

Abbreviations De-mystified

IESS – Intelsat Earth Station Standard

The Intelsat Earth Station Standard outlines the performance characteristics and specifications required of all earth stations communicating with satellites owned or operated by Intelsat, plus other modulation and access technique information.

IDR – Intermediate Data Rate

This technology is designed to provide E1 connectivity through a satellite network at the rate of 2.048 Mbps and multiples. IDR meets the standard compliance and performance requirement for IDR carriers as per IESS 308/310.

IFL – Interfacility Link

An IFL, or Interfacility Link, is a cable system that is used in facilities to connect an outdoor unit and an indoor unit. An outdoor unit refers to the satellite receiver or coaxial cable that connects a service provider to a company while an indoor unit refers to the coaxial cables, routers, or transmitters inside the building. IFLs are used to minimize the amount of interference received on the transmission by rerouting the signal through a combination of different technologies.

LDPC – Low Density Parity Check

A linear error correcting code, a method of transmitting a message over a noisy transmission channel.

M&C – Monitor and Control

Remote monitoring and control systems are designed to control large or complex facilities such as network operations centers with some degree of automation. M&C systems may receive data from sensors, telemetry streams, user inputs, and pre-programmed procedures. The software may send telecommands to actuators, computer systems, or other devices.

Mbps – Megabit per second

Mbps is used in reference to download and upload speeds. It takes 8 bits of data to equal 1 byte.

MCPC – Multiple Channels per Carrier

Transmission of many connections multiplexed over a single carrier, which uses the full bandwidth of a transponder. This high efficiency is ideal for burst transmissions, utilizing a form of Time Division Multiplexing (TDM).

MIB – Management Information Base (SNMP)

A management information base is a formal description of a set of network objects that can be managed using the Simple Network Management Protocol (SNMP).

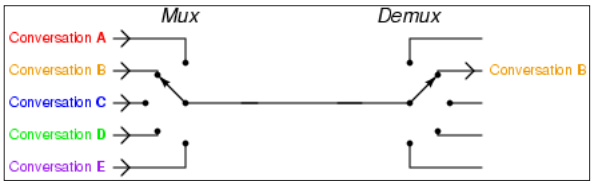
Msps – Megasymbol per second

Msps is equal to the baud rate divided by the number of bits per character. Converting Msps to Mbps depends on the Forward Error Correction rate and the encoding scheme.

Abbreviations De-mystified

Mux – Multiplexer

A device that selects between several analog or digital input signals and forwards the selected input to a single output line. The selection is directed by a separate set of digital inputs known as select lines. Usually paired with a demultiplexer, which directs the received output signal to an appropriate line.



P2MP – Point-to-Multipoint

Point-to-multipoint telecommunications is typically used in wireless Internet and IP telephony via gigahertz radio frequencies. P2MP systems have been designed with and without a return channel from the multiple receivers. A central antenna or antenna array broadcasts to several receiving antennas using Multiple Channels Per Carrier (MCPC). The system uses a form of Time Division Multiplexing (TDM). The return channel traffic can be either Single Channel Per Carrier (SCPC) or Time Division Multiple Access (TDMA).

PLL – Phase Locked Loop

A control system that generates an output signal whose phase is related to the phase of an input signal. Phase-locked loops are widely employed in radio, telecommunications, computers and other electronic applications. They can be used to demodulate a signal, recover a signal from a noisy communication channel, generate a stable frequency at multiples of an input frequency (frequency synthesis), or distribute precisely timed clock pulses in digital logic circuits such as microprocessors.

PRBS – Pseudo-Random Bit Sequence

A binary sequence that, while generated with a deterministic algorithm, is difficult to predict and exhibits statistical behavior similar to a truly random sequence. PRBS generators are used in telecommunication, such as in analog-to-information conversion, but also in encryption, simulation, correlation technique and time-of-flight spectroscopy.

PSK – Phase Shift Keying

A digital modulation process which conveys data by modulating the phase of a constant frequency reference signal (the carrier wave). The modulation is accomplished by varying the sine and cosine inputs at a precise time. It is widely used for wireless LANs, RFID and Bluetooth communication. Examples include:

8PSK – Satellite broadcasting with high definition programming is delivered almost exclusively in 8PSK due to the higher bitrates of HD video and the high cost of satellite bandwidth.

BPSK – Binary Phase Shift Keying is the simplest form of phase shift keying, in that it uses two phases which are separated by 180 degrees. It handles the highest noise level or distortion before the demodulator reaches an incorrect decision, which makes it the most robust of all the PSKs. It is only able to modulate at 1 bit/symbol, so is unsuitable for high data-rate applications.

OQPSK – A variant of phase-shift keying modulation, Offset Quarternary Phase Shift Keying uses four different values of the phase to transmit. Taking four values of the phase (two bits) at a time to construct a QPSK symbol can allow the phase of the signal to jump by as much as 180° at a time. When the signal is low-pass filtered, these phase-shifts result in large amplitude fluctuations, an undesirable quality in communication systems. By offsetting the timing of the odd and even bits by one bit-period, or half a symbol-period, the in-phase and quadrature components will never change at the same time. This yields much lower amplitude fluctuations than non-offset QPSK and is sometimes preferred in practice.

Abbreviations De-mystified

PSK – Phase Shift Keying (continued)

QPSK – Quarternary Phase Shift Keying uses four points on the constellation diagram, equispaced around a circle. With four phases, QPSK can encode two bits per symbol. QPSK can be used either to double the data rate compared with a BPSK system while maintaining the same bandwidth of the signal, or to maintain the data-rate of BPSK but halving the bandwidth needed.

RS – Reed-Solomon

A group of error-correcting codes that have many applications, the most prominent of which include consumer technologies such as MiniDiscs, CDs, DVDs, Blu-ray discs, QR codes, data transmission technologies such as DSL and WiMAX, broadcast systems such as satellite communications, DVB and ATSC, and storage systems such as RAID 6.

RX – Receive or Receiver

The process of receiving or capturing an analog or digital signal using a wired, optical, or wireless electromagnetic transmission medium. Or, a piece of equipment that allows that process.

SCPC – Single Carrier Per Channel

Refers to using a single signal at a given frequency and bandwidth. Most often, this is used on broadcast satellites to indicate that radio stations are not multiplexed as subcarriers onto a single video carrier, but instead independently share a transponder. It may also be used on other communications satellites, or occasionally on non-satellite transmissions.

SNMP – Simple Network Management Protocol

A networking protocol used for the management and monitoring of network-connected devices in Internet Protocol networks.

TCM – Trellis Coded Modulation

This modulation scheme transmits information with high efficiency over band-limited channels, such as telephone lines.

TDM – Time Division Multiplexing

A method of transmitting and receiving independent signals over a common signal path by means of synchronized switches at each end of the transmission line so that each signal appears on the line only a fraction of time in an alternating pattern.

TDMA – Time Division Multiple Access

A channel access method for shared-medium networks. It allows several users to share the same frequency channel by dividing the signal into different time slots. The users transmit in rapid succession, one after the other, each using its own time slot. This allows multiple stations to share the same transmission medium (e.g. radio frequency channel) while using only a part of its channel capacity.

Abbreviations De-mystified

TPC – Turbo Product Coding

Turbo product codes are a promising approach for power-efficient communications, particularly in satellite and terrestrial wireless systems.

TRANSEC – Transmission Security

The process of securing data transmissions from being infiltrated, exploited or intercepted by an individual, application or device. TRANSEC secures data as it travels over a communication medium.

TX – Transmit or Transmitter

The process of sending and propagating an analog or digital signal using a wired, optical, or wireless electromagnetic transmission medium. Or, a piece of equipment that allows that process.

VCM – Variable Coding and Modulation

Communication scheme which allows optimizing bandwidth utilization by dynamically changing transmission parameters. Typically based on the priority of the input data.

VLAN – Virtual Local Area Network

Any broadcast domain that is partitioned and isolated in a computer network at the data link layer.

Global Sales Offices

U.S., Canada, Latin America
Teledyne Paradise Datacom
11361 Sunrise Park Drive
Rancho Cordova, CA 95742
Tel: +1 (814) 954-6163
sales@paradisedata.com

Eastern Regional Sales Office
(Eastern U.S. & Latin America)
RF Inquiries: John O'Grady, (848) 220-6464
Modem Inquiries: Mike Towner, (470) 509-9941
sales@paradisedata.com

Western Regional Sales Office
(Western U.S. & Canada)
Bruce Grieser
Cell: +1 (480) 444-9676
sales@paradisedata.com

U.K. Office
Europe, Middle East, Africa
Teledyne Paradise Datacom
106 Waterhouse Lane,
Chelmsford, Essex, England, CM1 2QU
Tel: +44(0)1245 847520
Tel: +44(0)1376 515636
sales@paradisedata.com

Asia Pacific
Tavechai Mektavepong
Teledyne Paradise Datacom Thailand Office
333, 20 C1 Fl., Lao Peng Nguan Tower 1,
Vibhavadi-Rangsit Rd.,
Chomphol, Chatuchak,
Bangkok 10900
Thailand

Tel: +66 2-272-2996
Fax: +66 2-272-2997
sales@paradisedata.com

Beijing, China
Teledyne Paradise Datacom Representative Office
Room 204, No.1 Building,
No.9 Jiuxianqiao East Road,
Chaoyang District,
Beijing, China 100016

Tel: +86 13601251528
sales@paradisedata.com