Long Term Evolution (LTE), often referred to as fourth-generation (4G) LTE, has become the worldwide standard for wireless communication of high-speed data for mobile devices and data terminals. For LTE to work with existing networks, designers must employ complex modulation schemes, multiple-input and multiple-output (MIMO), and other challenging features. The details of the LTE specification as implemented within Visual System Simulator™ (VSS) includes:

### MIMO Downlink Sources & Receivers
- FDD and TDD
- Encoding for physical data channel (PDSCH)
- Physical control channels (PDCCH, P.SCH, S-SCH and reference signals)
- Full flexibility in resource block allocations
- Downlink signal source for 1, 2, or 4 antennas with pre-coder and layer mapping supporting spatial multiplexing and transmit diversity
- Downlink signal sources/transmitters for 1, 2 or 4 antenna ports

### Uplink Sources & Receivers
- FDD
- Support for multiple PUSCH channels
- SRS
- Full flexibility in resource block allocations
- Scrambler, modulation mapper, transform pre-coder for SC-FDMA

### Channel Coding
- Convolutional Encoder
- Viterbi Decoder
- CRC Encoder/Decoder
- Scrambler/DeScrambler
- DL Channel Encoder/Decoder
- TurboCoder/TurboDecoder
- DL Frame Assembler/Disassembler
- UL Channel Encoder/Decoder/QW
- UL Channel Interleaver/Deinterleaver

### MIMO Precoder
- DL MIMO Precoder
- DL MIMO Layer Mapper
- DL MIMO Modulation Mapper
- DL MIMO Deprecoder
- DL MIMO Layer Demapper
- DL MIMO Modulation Detector

### Modulation
- DL Layer Mapper/ Demapper
- DL Modulation Mapper
- DL Precoder
- DL OFDM Modulator
- DL Modulation Detector
- DL Deprecoder
- DL OFDM Demodulator
- DL MIMO Mapper
- UL Layer Mapper/ Demapper
- UL SC-FDMA Modulator/ Demodulator
- UL DFT (Transform Precoder/ Deprecoder)

### Source
- DL 1 Ant Source
- DL MIMO 2 Ant Source
- DL MIMO 4 Ant Source
- DL TX
- UL Source

### Multiplex
- DL Frame Assembler/ Disassembler
- DL OFDM Sym Extract
- DL Slot Extract
- DL MIMO DemuxCIR
- UL Frame Assembler/ Disassembler
- UL SC-OFDM Sym Extract
- UL Slot Extract

### Receiver
- DL 1 Ant Receiver
- DL MIMO 2 Ant Receiver
- DL MIMO 4 Ant Receiver
- DL Receiver
- UL Receiver

### Signaling
- PDSCH and PDCCH Generator
- P-SCH and S-SCH Generator
- DL REF/ SIG Generator
- PDSCH, PDCCH and PUSCH Scrambler
- UL PUSCH Generator
- UL REF/ SIG Generator

### Sync Signal
- DL Pilot