

## CLAIMS

1. A communication system comprising:

at least one communication network node having a capacity for communicating with at least one additional communication network node at a given center frequency and according to a given communication protocol; and

at least one external frequency converter, external to said node, said converter shifting the transmitted signal of said at least one network node from said given center frequency to a first alternative center frequency, thereby defining a first frequency change, said first alternative center frequency being changed from time to time, thereby defining  $n$  frequency changes and  $n$  alternative center frequencies to be used on the  $n$  frequency changes, respectively, during the communication between said at least one communication network node and said at least one additional communication network node,

wherein said external frequency converter is operative to transmit, in addition to the transmission according to said communication protocol at said first alternative center frequency, a signal at a second alternative center frequency,

wherein said second alternative center frequency is equal to an alternative center frequency from among said  $n$  alternative center frequencies, to be used on a frequency change from among said  $n$  frequency changes subsequent to said first frequency change, and

wherein  $n$  is an integer.

2. The communication system according to claim 1 wherein the channel compensation carries information of the frequency to be used when an upcoming frequency change occurs.
3. The communication system according to claim 1, wherein said external frequency converter comprises a channel compensation signal generator operative to generate said channel compensation signal.
4. The communication system according to claim 1, wherein said channel compensation signal is a band limited White Gaussian Noise (WGN) signal.

5. The communication system according to claim 1, wherein said external frequency converter comprises a synchronization detector, operative to detect a predetermined portion of the signal of said communication protocol, and to synchronize said change in said first and second alternative center frequencies during said detected portion of the signal.
6. The communication system according to claim 5, wherein said predetermined portion is a Cyclic Prefix of an orthogonal frequency-division multiplexing (OFDM) symbol.
7. The communication system according to claim 5, wherein said predetermined portion is a Cyclic Prefix of an orthogonal frequency-division multiple access (OFDMA) symbol.
8. The communication system according to claim 5, wherein said communication protocol is a time division duplex (TDD) protocol, and wherein said predetermined portion is a gap between an uplink subframe and a downlink subframe of said communication protocol.
9. The communication system according to claim 1, wherein the channel compensation signal spans over several future instances of the first alternative center frequency thus constitutes a wideband signal.
10. The communication system according to claim 1, wherein the channel compensation signal is supplied to the external frequency converter from an external system.
11. The communication system according to claim 1, wherein the capacity for communicating comprises a transmitting capacity and wherein the converter comprises a Tx frequency converter.
12. The communication system according to claim 1, wherein the capacity for

communicating comprises a receiving capacity and wherein the converter comprises an Rx frequency converter.

13. The communication system according to claim 1, wherein the channel compensation signal is transmitted only during partial intervals of the transmission of the communication protocol.

14. A communication system operative for transmitting a channel compensation signal that is wideband over all frequencies, the communication system comprising:

at least one communication network node having a capacity for communicating with at least one additional communication network node at a given center frequency and according to a given communication protocol; and

at least one external frequency converter, external to said node, said converter shifting the transmitted signal of said at least one network node from said given center frequency to a first alternative center frequency, said first alternative center frequency being changed from time to time during the communication between said at least one communication network node and said at least one additional communication network node,

wherein said external frequency converter is operative to transmit a signal at a second alternative center frequency, in addition to the transmission of said communication protocol at said first alternative center frequency,

wherein said second alternative center frequency is a predetermined frequency, and

wherein said channel compensation signal has a bandwidth which spans over the frequencies of at least a multiple of said first alternative center frequencies as changed along the time.

15. The communication system according to claim 14, wherein said channel compensation signal bandwidth spans over all the possible frequencies of said changing first alternative center frequency.

16. The communication system according to claim 14, wherein the channel

compensation carries information of the frequency to be used when an upcoming frequency change occurs.

17. The communication system according to claim 14, wherein said external frequency converter comprises a channel compensation signal generator operative to generate said channel compensation signal.
18. The communication system according to claim 14, wherein said channel compensation signal is a band limited White Gaussian Noise (WGN) signal.
19. The communication system according to claim 14, wherein said external frequency converter comprises a synchronization detector, operative to detect a predetermined portion of the signal of said communication protocol, and to synchronize said change in said first and second alternative center frequencies during said detected portion of the signal.
20. The communication system according to claim 19, wherein said predetermined portion is a Cyclic Prefix of an orthogonal frequency-division multiplexing (OFDM) symbol.
21. The communication system according to claim 19, wherein said predetermined portion is a Cyclic Prefix of an orthogonal frequency-division multiple access (OFDMA) symbol.
22. The communication system according to claim 19, wherein said communication protocol is a time division duplex (TDD) protocol, and wherein said predetermined portion is a gap between an uplink subframe and a downlink subframe of said communication protocol.
23. The communication system according to claim 14, wherein the channel compensation signal spans over only partial frequency bandwidth as of the communication protocol.

24. The communication system according to claim 14, wherein the predetermined portion is a gap between successive frames of the communication protocol.
25. The communication system according to claim 14, wherein the channel compensation signal bandwidth spans over the frequencies of at least a multiple of the first alternative center frequencies as changed along the time.
26. The communication system according to claim 14, wherein said channel compensation signal defines a channel and also including a channel equalization block which equalizes the channel based on measurements made by the receiver based on the channel compensation signal.
27. A wireless communication method comprising:
- providing at least one wireless communication network node having a capacity for communicating with at least one additional wireless communication network node at a given center frequency and according to a given wireless communication protocol; and
  - providing at least one external frequency converter, external to said node, said converter shifting a received signal, received at a receiver, of said at least one wireless network node from a first alternative center frequency to said given center frequency, said first alternative center frequency being changed from time to time during the communication between said at least one wireless communication network node and said at least one additional wireless communication network node,
  - wherein said external frequency converter is operative to receive a signal at a second alternative center frequency, and
  - wherein said second alternative center frequency is equal to the first alternative center frequency to be used on the next frequency change.
28. A communication method operative for receiving a channel compensation signal which is wideband over all frequencies, the method comprising:
- providing at least one communication network node having a capacity for

communicating with at least one additional communication network node at a given center frequency and according to a given communication protocol, and at least one external frequency converter, external to said node, said converter shifting the transmitted signal of said at least one network node from a first alternative center frequency to said given alternative center frequency, said first alternative center frequency being changed from time to time during the communication between said at least one communication network node and said at least one additional communication network node,

wherein said external frequency converter is operative to receive a signal at a second alternative center frequency, and

wherein said channel compensation signal bandwidth spans over the frequencies of at least a multiple of said first alternative center frequencies as changed along the time.