[0005] A need remains for a contactless connector that allows installation of an antenna structure that facilitates rotary motion. A need remains for a contactless connector that provides inter-channel isolation.

[0006] According to an aspect of the present invention, a contactless connector is provided including a transmitter having a first transmit integrated circuit generating a first signal and a second transmit integrated circuit generating a second signal. A first pick-up antenna is adjacent the first transmit integrated circuit and conveys the first signal along a first transmission line to a first propagation antenna. A second pick-up antenna is adjacent the second transmit integrated circuit and conveys the second signal along a second transmission line to a second propagation antenna. The first and second propagation antennas transmit the first and second signals to a propagation path at different and separable polarizations to allow duplex communication with the propagation path.

[0007] ~~Optionally~~In an embodiment of the present invention, the first and second signals may be propagated as axisymmetric modes. The first signal may be right hand circularly polarized and the second signal may be left hand circularly polarized. The contactless connector may include an antenna element having a ground plane, the first propagation antenna and the second propagation antenna. The antenna element may have a dielectric substrate supporting and extending between the first propagation antenna and the second propagation antenna with at least one of the first and second transmission lines extending through the dielectric substrate. A shield may ~~separating~~ separate the first transmit integrated circuit and the second transmit integrated circuit.

[0008] Embodiments of ~~T~~the invention will now be described by way of example with reference to the accompanying drawings wherein:

[0009] Figure 1 illustrates a contactless connector formed in accordance with an exemplary embodiment showing a transmitter and receiver with a propagation path therebetween.

WHAT IS CLAIMED IS:

1. A contactless connector ~~(100)~~ comprising:

a transmitter ~~(102)~~ comprising a first transmit integrated circuit ~~(200)~~ generating a first signal and a second transmit ~~(202)~~ integrated circuit generating a second signal;

a first pick-up antenna ~~(208)~~ adjacent the first transmit integrated circuit and conveying the first signal along a first transmission line ~~(204)~~ to a first propagation antenna ~~(220)~~; and

a second pick-up antenna ~~(212)~~ adjacent the second transmit integrated circuit and conveying the second signal along a second transmission line ~~(206)~~ to a second propagation antenna ~~(222)~~;

wherein the first and second propagation antennas transmit the first and second signals to a propagation path ~~(106)~~ at different and separable polarizations to allow duplex communication with the propagation path.

2. The contactless connector ~~(100)~~ of claim 1, wherein the first and second signals are propagated as axisymmetric modes.

3. The contactless connector ~~(100)~~ of claim 1, wherein the first signal is right hand circularly polarized and the second signal is left hand circularly polarized.

4. The contactless connector ~~(100)~~ of claim 1, further comprising an antenna element ~~(150)~~ comprising a ground plane ~~(154)~~, the first propagation antenna ~~(152)~~ and the second propagation antenna ~~(158)~~.

5. The contactless connector ~~(100)~~ of claim 1, further comprising an antenna element ~~(150)~~ comprising a dielectric substrate ~~(160)~~ supporting and extending between the first propagation antenna ~~(152)~~ and the second propagation

antenna ~~(158)~~, at least one of the first and second transmission lines ~~(204, 206)~~ extending through the dielectric substrate.

6. The contactless connector ~~(100)~~ of claim 1, further comprising a shield ~~(214)~~ separating the first transmit integrated circuit ~~(200)~~ and the second transmit integrated circuit ~~(202)~~.