

## NR-5G Polar Decoder and Encoder FEC IP Core Available For Licensing and Implementation from Global IP Core

**September 11, 2023 - Global IP Core Sales** - The Forward Error Correction (FEC) sub-system is one of the essential basing blocks in any communication systems so a powerful FEC code is needed. The New Radio (NR) FEC for the control channel is proposed to be designed based on Polar codes allowing close to the Shannon limit/Capacity operation. The Polar code successive cancellation decoding process as needed for 3GPP physical layer standard. Parity Check bits simplify the pruning of the search tree. The New Radio (NR) Polar codes are defined by their generator matrices where the basic polarization transform is defined by the basic G2 matrix in section 5.3.1.2 of ETSI TS 138 212 V15.2.0 (2018-07). The encoding of the NR Polar code is performed in GF(2). The NR Polar codes are structured using the static reliabilities in Table 5.3.1.2-1 of ETSI TS 138 212 V15.2.0 (2018-07). Maximum code block length is 1024 bits and minimum is 32 bits as in section 5.3.1 of the same ETSI doc. The number of Extra parity check bits is defined in Subclause 5.3.1.2 and they are used to simplify the decoding process and reduce decoder complexity. Would be easily integrated with interleavers and Rate matching circuitry for providing all rates supported by 5G NR.



### Additional features include:

- Successive Cancellation Decoding
  - With List Decoding
  - With Parity Check bits
- Soft decision decoding
- Max. Block length is 1024
- Wide range of block lengths and data rates to be selected based on rate matching
- Fixed reliability channels as specified by standard
- High peak rates and low latency
- 3GPP TS 38.212 V15.1.1 compliant
- Easily integrated to rate matching functional units

### Application:

- 3GPP-LTE Rel. 15; eMBB control channel code
- 5G NR air interface
- Machine to machine communication (M2M)
- High traffic IOT

Please contact us for more information at [info@global-ipc.com](mailto:info@global-ipc.com) or check out our product portfolio at [www.global-ipc.com](http://www.global-ipc.com)

### About Global IP Core Sales:

Global IP Core Sales® was founded in 2021 and provides state-of-the-art IP Cores for the Semiconductor market. The majority of our products are silicon proven and can be seamlessly implemented into FPGA and ASIC technologies. Global IP Core Sales® will assist you with your IP Core and integration needs. Our mission is to grow your bottom line.

