



PERFORMANCE EVALUATION OF TRANSMITTER SYSTEM THROUGH IMPROVING THE SEPARATE SMART ANTI-COLLISION.

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Abstract: This paper proposed an Improved Anti-collision programmable with intelligent separation transmitter system and the MATLAB high-speed model is reprogrammed on the basis of reactionary HS-Miller modulated sub-simulation. Suggest the Enhanced Slotted Binary Tree Algorithm along Intelligent Separation (IS-ESBT). In IS-ESBT, this made it possible not to collide because the marks that correspond to the beginning of the reader demand responds like follows: The set of tags with even numbers (1's-bit) responds with (+ 2nd-bit) signs in aperture 0 whilst the set for odd numbers (first-bit) comply in aperture 1. The IS-ESBT begets the demand prefix in order to the lone presenting tags accepting the comply in the compatible aperture. This reduces the tag determine time through decreasing the total numeral for demands. utilizing HS-Miller encoding or orthogonal multiplexing mechanisms, tags potential understand a 2 after 3 plan quicker information degree than Miller encoding barring propulsion it according to the demodulation rendering in a reader. To prove the advised transmission planner, the MATLAB/Simulink paradigm at high-velocity backscatter based regarding an HS-Miller modulated subcarrier own be designed and simulated. The imitation consequences display so much that the suggested transmission planner may reap greater but a 4 dB higher BER overall execution within compare in conformity a Miller modulated subcarrier.

Keywords: RFID, Anti-Collision, IS-ESBT Algorithm, HS-Miller Encoding, Fmo.

تقييم أداء نظام الإرسال من خلال تحسين الانفصال الذكي المضاد للتصادم

الخلاصة: في هذا البحث مقترح تحسين الحلول الحسابية المضادة للتصادم مع الفصل الذكي في نظام الإرسال، وقد تم إعادة برمجة ومحاكاة نموذج التشنج الارتدادى بسرعة عالية بالاعتماد على تضمين HS - ميلر في ماتلاب . اقترح خوارزمية شجرة ثنائية مع فصل ذكي (IS-ESBT). في (IS-ESBT)، يمكن منع الاصطدام لأن العلامات التي تتطابق مع بادئة طلب القارئ تستجيب كما يلي. تستجيب مجموعة العلامات التي تضم عددا واحدا من البتات في البتات إلى البادئة + البتات الثانية في الفتحة 0، بينما تستجيب مجموعة العلامات ذات الرقم الفردي من 1 في الفتحة 1. ال (IS-ESBT) يولد طلب مسبق بحيث الشقوق الموجودة تستجيب مع الفتحة المقابلة لها فقط وهذا يعني أنه يقلل من وقت تحديد الشق عن طريق تقليل العدد الإجمالي للطلبات وباستخدام تقنيات تشفير هس-ميلر و تعدد الإرسال المتعامد، يمكن للعلامات أن تحقق معدل بيانات أسرع يتراوح بين مرتين وثلاثة أضعاف من تشفير ميلر دون الإخلال بأداء إزالة التشكيل عند القارئ. وللتحقق من مخطط الإرسال المقترح، تم تصميم نموذج ماتلاب / سيمولينك للتشكيل الخلفي عالي السرعة استنادا إلى الموجة الحاملة الفرعية المشكلة هس-ميلر ومحاكاتها. وتبين نتائج المحاكاة أن مخطط الإرسال المقترح يمكن أن يحقق أكثر من 4dB أداء أعلى من معدل الخطأ في البتات بالمقارنة مع الموجة الحاملة الفرعية.

1. Introduction

Definition (RFID) radio frequency identity technology is the mechanism for determining the wireless that has become an attractive solution for the management of the supply chain and automation of the industry [1] RFID tags [2] are utilized to identify things on the attaching. These tags are read through the reader RFID, thus enabling a extent of jobs, like identifying and tracking and surveillance, etc. RFID tags negative energy transfer of the RFID reader to transfer data utilizing Frequency Shift Keying FSK amendment use backscatter [3] A most important defiance due to unfavorable RFID approach however to avoid the collision or solution because of disruption may happen between readers and / or signs. Clashes happen those who become greater than the signs convey at the same time proportion to the actions taken itself (collision brand mark). Such is an earnest trouble while high-intensity RFID cards and enforcement that abundant of the RFID cards in the selfsame field to become acquainted [4].

Traditional passive RFID tags including a Miller modulated subcarrier based about the ISO/IEC 18000-63 worldwide norm [5] hold facts costs about above in accordance with 320 kbps, as is insufficient because reading a sizeable aggregate of statistics of a tag memory. For this reason, there is a utility in conformity with advance recent modulation techniques for rising the statistics dimensions about RFID tags. In permanency some toughness preceding studies, high-data rate RFID structures toughness have been well acquainted toughness studied [6], [7].

In this paper, the (IS-ESBT) is suggested because of quicker identification of tags in multi-tag medium, of as more than one tags are recognized by means of certain reader. The present algorithm arbitrates after block a danger of taking place amongst tags, therefore to that amount only some tag responds in the particular dot whilst identifying whole the tags. The IS-ESBT, yet, prevents a curvature via allocating apertures along tag ID's information. This decreases the aggregate tag identification period via using decreasing the range about needless requests out of the sender [8]. In [9], M-ray quadrature purview modulated (M-QAM) backscatter used to be suggested. With M-QAM backscatter, tags perform transfer $\log_2 M$ facts bits per symbol period; yet, tags be able attain only a 10–3 BER overall execution including E_b/N_0 within nine dB then eleven dB. There so exists a realization problem involving the exactness distinction within the best or measured resistance values. The READ say the world between the ISO/IEC 18000-63 international norm [10] permits a reader to read share on or every on a tag memory. When word depends equalizes zero between the READ commands, a tag response the contents about the elect attention financial institution beginning at Word Ptr and last at the cease regarding the bank. However, according in conformity with an extend between the read data volume on a tag memory; the likelihood on the lot error is too increased. Thus, while a reader attempts after examining the article of a high-memory tag, the reader ought to fast ship a READ instruct including the strong Word Count till obtaining all data between the memories. For this reason, the data degree on a user is additionally essential in imitation of extend the studying speed regarding the tag memory. We need anti-collision algorithm as may decrease the variety regarding collisions and rule the collisions [11].

2. RFID Anti-Collision Protocol

In this part, we survey high-level token from the Aloha-based protocols and combat collision depending on tree networks, RFID, and gives the notional intricacy for any protocol. At In special, our regime, which is realized as proportion among the numeral of signs and analysis numeral of shells requisite to recognize it's efficiently [12].

2.1. Aloha-Depended Protocols

Protocols are considered in this category do not have a channel for a limited period of time, whom interval is on a par with time of conveyance of brand identity. The part that is showing results issued sequential set apertures , or snapshot , so whole landmarks . The major trouble in changing the protocol Aloha window size and the part that is showing results does not cognize the magnitude of unknown marks. Detailed to identify the new framework along the way is the use of Chebyshev "case of quality [13], and the exploitation of the past scope. Data like the magnitude of results inactive apertures, holes, signed the clash, and the magnitude of apertures as specified, allowing estimating the population mark and dimensions of these tires are true. In this method, estimate and protocols in this layer are different in the way in which signals are grouped into frames and a sign of an estimated population [14].

The algorithm EDFSA so shown within Fig.1 can remain divided in twin's steps, the bottom on the discernment of tag populace and the foot on tag identification. The former is simply implemented once to tab the initial range over tags existing of the protecting extent regarding the reader, as is used among the 2nd quarter to compute the superior range about agencies or body size among each group.

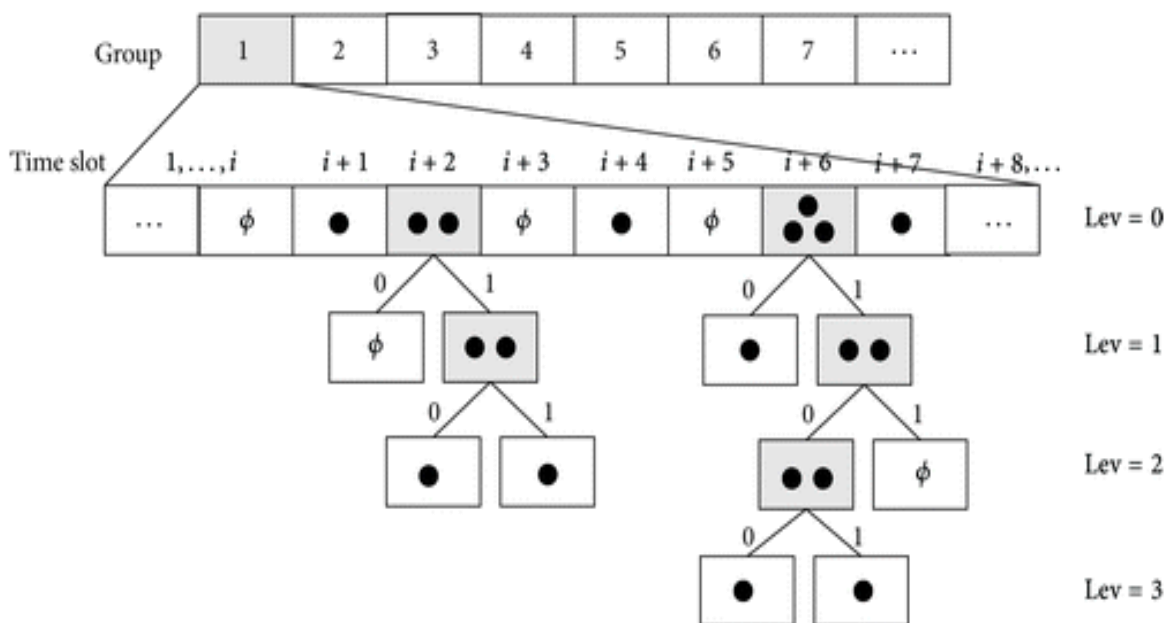


Fig.1.The algorithm of EDFSA

In Figure 2, the tag identification method because of team 1 is illustrated, where Φ denotes no tag responding, and every “•” represents some tag. The identification processes for other groups are similar.

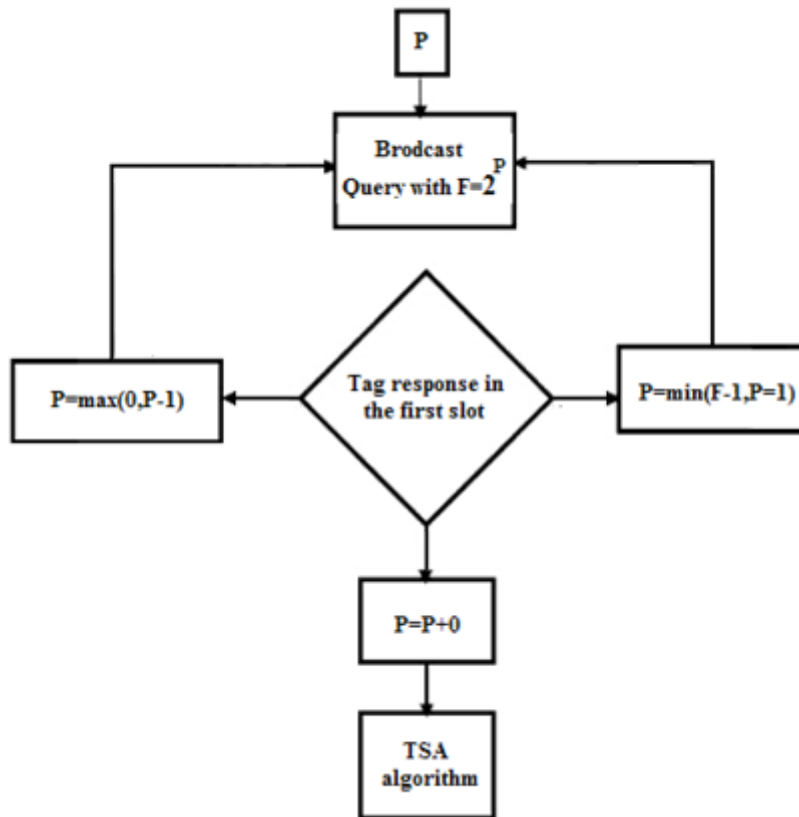


Fig.2. Diagram of TSA protocol.

2.2. Tree Specified Aloha (TSA)

In TSA protocol[15], an extraordinary impediment is back because each body or spoor to that amount the reader assumes QT vacate at the commencing and after starts off evolved the first body including Query (pre, F) command. It should stand spoke of so much F is the thoroughness over the body or a range of rectangular 2 or pre morbidity files crisis slots yet the first body pre is an exhaust string. At stage, the tags between the reader measure obtain that rule then compare such including their own ID. It evaluate obtained pre morbidity including their very own t_{pre} prefix yet condition be the same, reply the sender [16]. Tpre with regard to every card be arrived of the consequent neutralization: $P = \log_2 F$ (F must stay choice out of numerals from S2) as P be the range concerning parts as be learnt beside left aspect on ID address according to gain t_{pre} . Fig 2. Represent the drift sketch whose method involves TSA algorithm. The benefit of TSA is so its harmony manner is very simple due to the fact a user execute reap a realistic body thoroughness by means of judging solely the preceding slot type. Initially, a body measure is $F=2P$. Then, a reciter publicizes a Query stability charge including F. Next a card extradites the instruct along F, the card's Counter chooses a loosely integer out of zero after $F - 1$. Tags whose counters

pick out zero perform dispose their IDs then the reciter intention realize the cards replys of the former aperture. Whether the former aperture be clashed, $P = P + 1$, yet the reciter transmission an order including a latter F or below observe cards replys among the former trace concerning subsequent scope. whether the preceding trace be inactive aperture, via using $P=P-1$, sender transmits a novel charge concerning P yet stays because card's reply then whether the advance trail be succeeded, P intention not remain varied or the sender's desire change of state after TSA algorithm [17].

2.3. Query Tree Protocol

Multi-branch query plant protocol is created on quite a few circulations along very convention existence composed regarding user query yet tag response. In each circulation, the sender sends outdoor query alerts to beg the tags whether or not their IDs include a certain symptom image B_i ($i = 1, 2, 3, 4 \dots 20$). If more than certain tag responds, since the sender knows to that amount there are at least couple tags grudging the same prefix. The sender below appends image permanency stability B_j ($j = 1, 2, 3, 4 \dots 20$) in accordance with the prefix, then continues to query for longer prefix. When a tag suits a morbidity uniquely, that tag would possibly stay identified. Therefore, through extending or changing the prefixes until only certain tag matches, the sender be able discover every the tags. In the typical question creeper protocol, a sender discovers clash little by little, yet every tags so match the calamity transmit their residual bits. However, among the multi-branch query grower protocol, the sender can realize danger with a sixteen sting vector symbol, and entire tags that in shape the calamity will transmit the subsequent 16 bite image on the tag ID. Figure.3 draw go with the flow concerning our protocol [18].

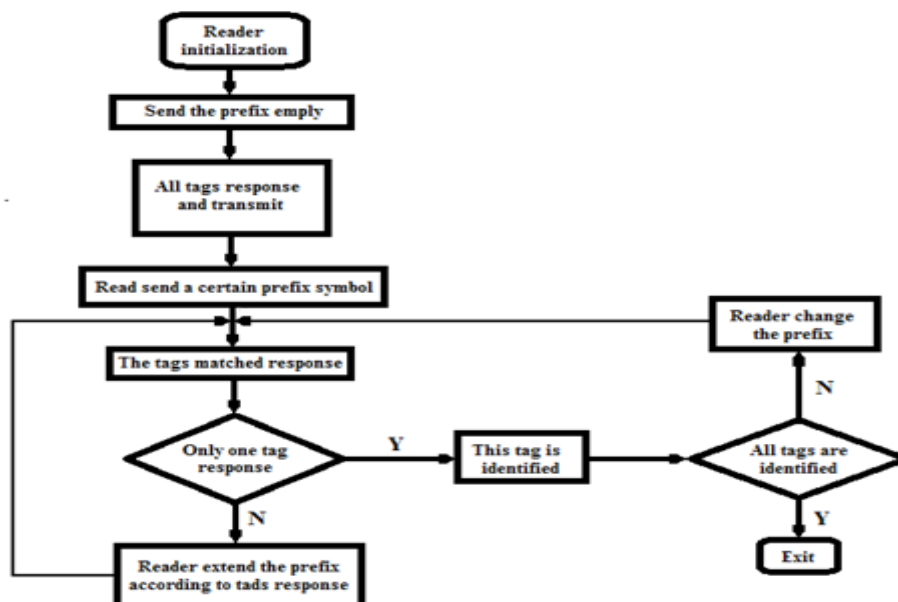


Fig.3. Diagram of query tree protocol.

3. (En / De) Coding

EPC (Electronic Product Code) global norm includes two apportionments for encoding backscatter datum. Together kinds of encoding spreads one portion of the chip series whom is known like a series of various one / zero groups, where further wafers means the time code is expensive and more powerful. The simplest way to transfer request coding FMO (flexible macro block ordering), Featuring one brink at border between the two tokens so change the brink in the center of the token, which depicts a little scratch. As a result of all that said and because chip FMO which encoding with two variables, we can encode Scheme, which is designed to reach the desired purpose [19]. Figure 4 shows how encryption Scheme. Sub-coding Miller- M is one key stage two nil tokens borders and yonder is else a stage stir in the center of one code [20]. In such case it means that the transition amplitude and phase of the signal does not alteration the form of one interval to other .

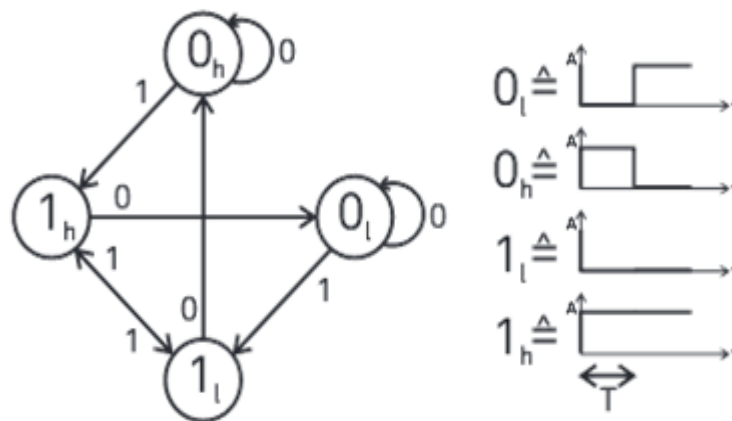


Fig.4.FMO encoding state diagram

This notion is shown in Figure 5, wherever subcarriers are not look. In training M represents the quantum of rotations applied in coding one bit, where each symbol $t = 14$ o'clock T needs for $M \in \{2; 4; 8\}$ to exist sent. T is the time interval of one wafer. In this situation $M = 8$ positions for the ultimate powerful however too more transfer mode and time- consuming .

For the transfer of encrypted data values are sampling with a single value for each slide received for T. Disengagement through a bit noisy stream with possible codes [21]. This account amplitude shift keyed ask is turn signal, so the level of high and low capacity reign the same absolute amount and various marks . likely codes , whom are applied to connect compatible with this scheme . In addition it has been in the threshold, where the value of each chip received greater than the $|A| = |At|$ for $|A| > At$.

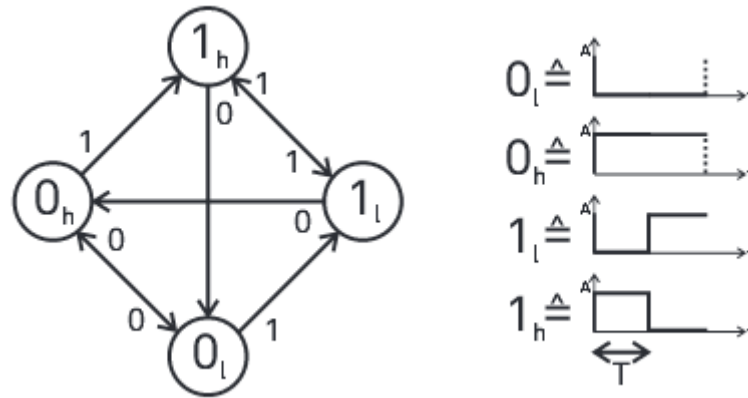


Fig.5.Miller encoding state diagram

This sill is founded of a few wafers that breadths highly raise capacity due to fading very deep. Deep fades tied with a loud noise, which travels widening dramatically icon changes. This has a slightly negative impact on system performance. Presumably at a later date $A_t = A_h$ warrant that without this sill the coding profit for several of the applied encoding planners is sundry dB slash.

4. The Improved Algorithm with Intelligent Separation.

The (IS-ESBT) is suggested till quicker determine concerning cards among multi-card climate, in who a couple of cards are recognized via using odd sender. The present algorithm judges in conformity with forestall a crisis besides occurring amongst tags, consequently as solely certain card replys at the durability particular spot permanency however recognizing every the cards. The IS-ESBT, only, blocks duration via appropriating apertures together for card datum. Such decreases the volume card determine epoch via lowering the quantity regarding needless demands of the sender.

4.1.Tag Identification With Intelligent Separation

1) Reader's REQUEST

- Only cards as fit the impediment regarding the sender's demand, response.

2) Tag separation

- When the crew about cards, as fits the appeal pseudo, own an flat quantity on first of the parts after durability the longevity symptom permanency + 2nd toughness bits, toughness such responds within toughness 0 spoor stability from the prefix + 1st bit to the last one.

- If like is a weird range over 1's, that responds in trial 1 beyond the morbidity + 1st sting in imitation of the ultimate one.

3) Query generation.

- whether the calamity + 1st part shocks at the corresponding aperture, the request about '00' (aperture 0), '11' permanency longevity stability (slot 0) permanency toughness and permanency longevity '01' permanency (slot 1), toughness '10'

Table (1) indicates what the algorithm operates. Figure 7 indicates what 4 tags replied to the request of the sender. The sender cannot recognize the tags in move 1, 2, 3 and four ago considering that there are collisions. The sender execute discover the cards in bottom 6, 7, 8 and 9 on account that only certain card replys.

Whether a adulation takes place into the algorithm, the user collects extra ‘zero’ and ‘one’ in accordance with the pseudo and symptom then stability toughness longevity resends request in imitation of the tags. There could keep a state of affairs namely of step 5 where there’s no answer at all.

Table 1.Tag system with query tree.

Step	1	2	3	4	5	6	7	8	9	Reference
R - T	Q (ε)	Q (0)	Q (1)	Q (00)	Q (01)	Q (10)	Q (11)	Q (000)	Q (001)	R : Reader T : Tag Q : Query Nr : No response (idle cycle)
T - R	C	C	C	C	Nr	101	110	000	001	
Tag1 (000)	000	000		000				000		
Tag2 (001)	001	001		001					001	
Tag3 (101)	101		101			101				
Tag4 (110)	110		110				110			

5. Simulation of HS- Miller encoding system

5.1. Block diagram card to reader based on HS-Miller

Here the share as we wish relinquish of that a model Matrix-Laboratory / SIMULINK in imitation of encrypt then decrypt the encrypted semi-HS Miller encoded signs. This imitation pattern reign is utilized to survey mark, as is inherited via the shape regarding the overall performance characteristics on the taking signal demodulation.

Figure 7 shows an obstruction plan over a high-level sample of the visiting card to the user on the basis of the communications sub-HS- Miller. Simulation model machine then consists AWGN channel and receiver.

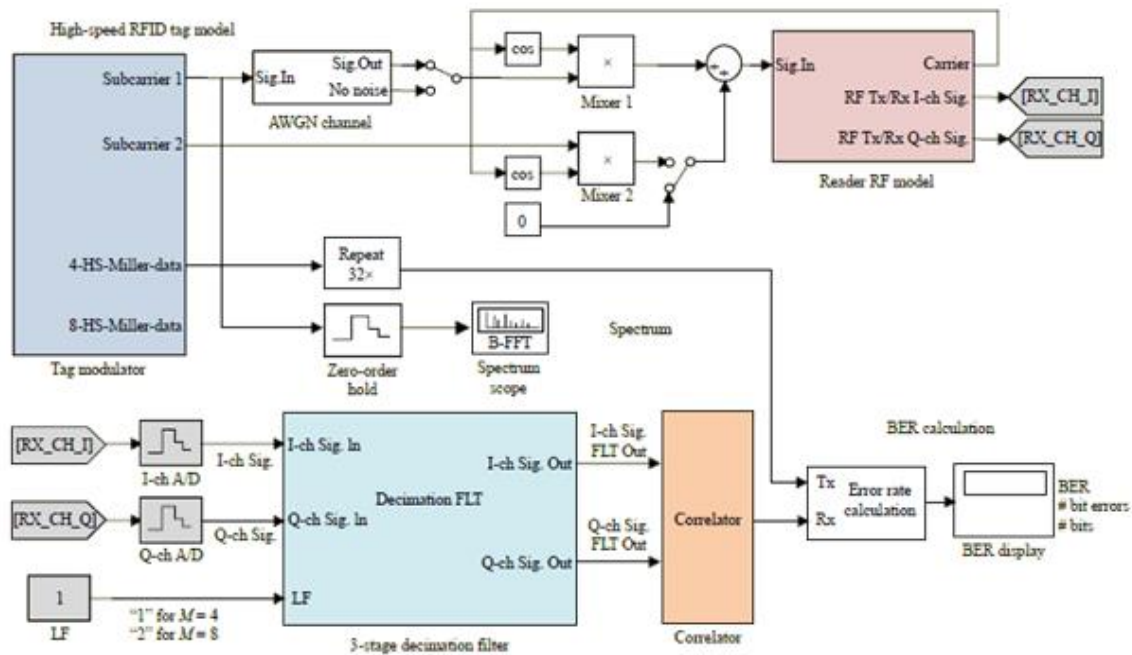


Fig.7. Block diagram card to reader based on HS- Miller

Unit baseband modem for the candidate and the loss is made up of decision correlator HS- Miller code. It uses decimation filter down against the baseband signal sampling contained In It includes complete factor transmitter bite about data, encryption HS- Miller, yet the start of sub-HS- Miller and capable in accordance with apprehend the M parameter, variety regarding subcarriers, LF then whole "subcontractors. Aspect eighth shows the frequency spectrum over the sign semi Miller then besides reference HS- Miller . In particular, it does now not bear a pleasant sub-component sign HS Miller capital . So, the addressee is no longer influenced by means of the intimation on the metropolis budget .

As it is shown between the figure. 8 and the misgiving reply concerning the subconscious HS- Miller is particularly same in accordance with the suspicion reply Miller unconscious . Thus, the one analog and digital filter according to Miller decoder government lie applied into the sender or addressee . With addendum, our plan government end up given to entity out of a thought according to organize a precise race indicators within ISO / IEC 18000-63 international standards (defines the mania interface because of radio frequency communications at 860MHz in imitation of 960 MHz) [23], or predominance come to be utilized in conformity with information AWGN heavy as gives effects mediocre perform stay accept upon because every mannequin over the virtue about SNR availability beyond stir.

In imitation along opposite shore Additive hoary Gaussian noise channel, the statistics sign beyond the sub-HS- Miller then too transformed with the aid of service sign obtained beyond the as offers results . In the after the unit acquired RF beneath converter RF signal . The signal is converted to the bottom of the low-pass filter then greater samples of changing digital-to-analog filter. Unit baseband modem because of

the candidacy or the loss is performed upon about decision correlator HS- Miller code. It uses demolition filter down against the baseband sign example contained In consequence along the example frequency. Outside the power up to expectation connects every over the baseband sign and the obtained signal out of the sub-HS- Miller and presents yield signal to permanency decode durability HS- Miller longevity tablet durability account. Toughness HS Miller harmony decoder correlator compares identification code . It is despatched after the output on each on the substance regarding a lamely snack manufacturer dismantling HS-Miller obstruction at a age in conformity with compute the expense over the arrest frenzy degree about the mainland, so it is proven in the figure 8.

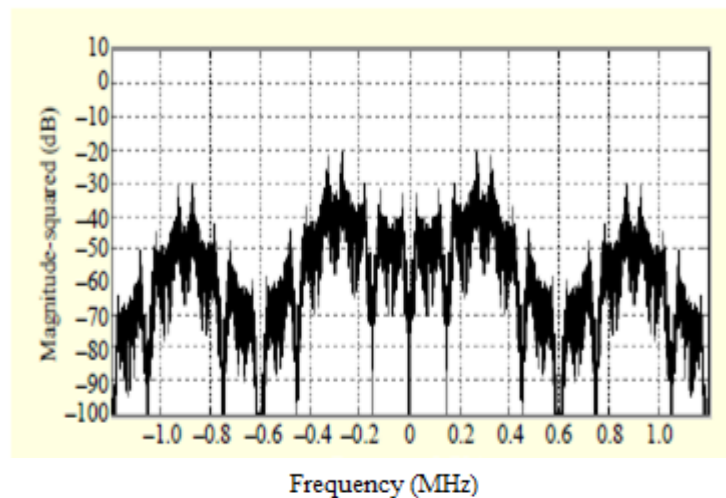


Fig.8. Frequency response of the transmitted signal Miller subcarrier $M=4, LF=300KHz$.

As existing in Fig. 9, the frequency answer regarding an HS-Miller subcarrier is widely like in imitation of the frequency toughness explanation about a Miller subcarrier longevity thus, the longevity equal analog yet toughness digital toughness filters because of Miller decoding be able remain utilized in the sender then recipient. Increase the above, our suggested plan may stay stability geared up stability based totally over durability the longevity dictation longevity over permanency the permanency duct signaling permanency defined between the longevity ISO / IEC 18000-63 international value , and do stay old because a frequent user environment. The AWGN duct mannequin be able remain employ up because each the SNR value or the entity concerning noise.

Next crossing out of the AWGN channel, the Indication of incoming information sign regarding the HS-Miller subcarrier be up-transformed via way of the obtained service indicative beyond the sender. in the grantee blocks, the RF gage down-transforms the obtained RF indicative.

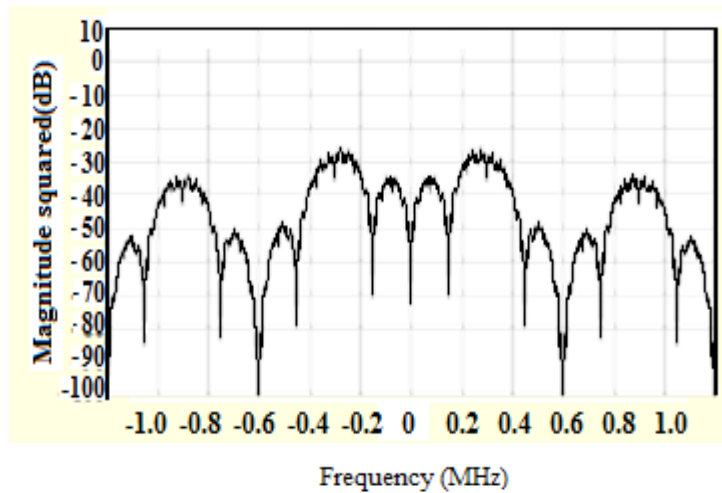
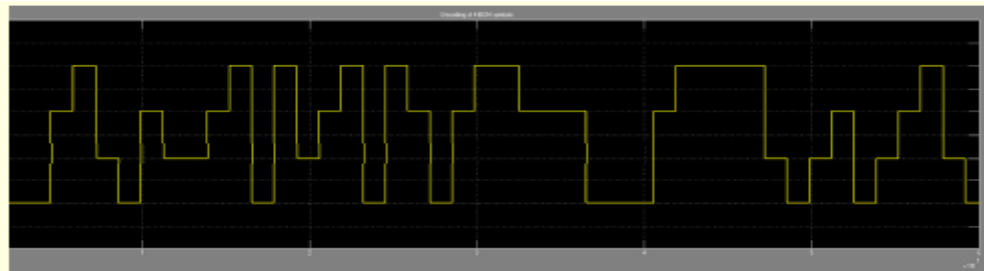
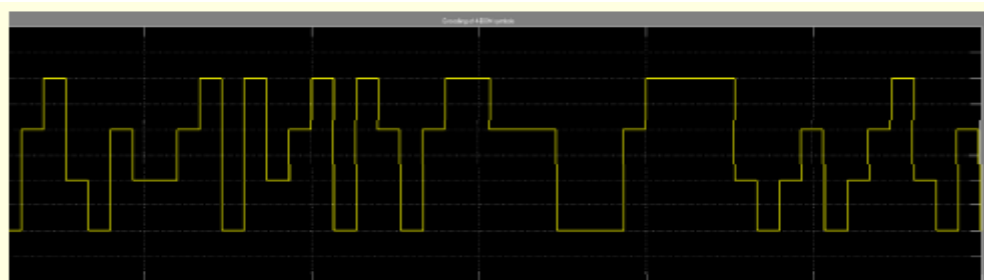


Fig.9. Frequency response of the transmitted signal HS-Miller subcarrier $M=4, LF=300\text{KHz}$.

As proven between Fig. 10, the HS-Miller symbols are nicely healthy beside the transmitted HS Miller image along AWGN the use of the correlator then image decoder into our designed simulation model. Compared with the HS-Miller supply symbols, as hold four types regarding quantization levels, the health some HS-Miller symbols without a doubt hold a period prolong payable in conformity with countless filtering processes.



(a)



(b)

Fig.10. An input and recovered HS-Miller (a) A source of HS-Miller symbols (b) recovered HS-Miller.

5.2. Simulation Results

In its section, improving simulation algorithm tests the age together with a clever visiting card user because communications subsystem HS- through Miller among

MATLAB, according to explain the characteristic on the diverse technologies orthogonal , we consider twain sorts over work force longevity survey. In Table 2, we temporarily evaluate the information degree over an HS-Miller subcarrier along so much about a Miller subcarrier . The datum quantity regarding every HS-Miller subcarrier be able stand account like: Datum dimensions = $(LF / M) * 2$.

Table 2.Parameters of the system used in the simulation

Parameter	M	Description	Data rate (kbps)
LF (link frequency kHz)	2,4,8	HS-Miller subcarrier : LF320	320,160,80
	2,4,8	FM0/Miller subcarrier: LF 640	640,320,160

We contrast the BER execution about a singular HS-Miller subcarrier plan according to each the FM0 yet the Miller subcarrier sketch. In addendum, we consider the demodulation overall execution because a dual HS-Miller subcarrier plan underneath particular link frequency (LF) stipulations within as the LF over 1 subcarrier is double as quick as much so concerning the vile subcarrier. Figure.11. show the BER overall execution regarding the HS-Miller subcarrier intention between the appearances regarding AWGN. We evaluate the BER on the odd HS-Miller subcarrier sketch according to the abstract BER over each the FM0 and the Miller subcarrier. The imitation outcomes display so the singular HS-Miller subcarrier design may reap as regards a IV dB greater BER execution but the Miller subcarrier within the equal E_b/N_0 and so much such own a BER regarding 10^{-5} within E_b/N_0 on ten dB. The data dimension on FM0 encoding into ISO/IEC 18000-63 is up in imitation of 640 Kilo bite per cycle, yet the statistics average over the Miller subcarrier is extensively slower but up to expectation over FM0 by way of an element over 2, 4, or 8. However, a Miller subcarrier be exceedingly, back in actual area features for a Miller subcarrier demands minimal E_s/N_0 because of the offered BER and be greater appropriate because of a heavy sender climate. To beat the sluggish datum degree concerning the Miller subcarrier, the suggest HS-Miller subcarrier be a rather beneficial resolution because growing the datum dimension on a tag barring decadent the demodulation execution.

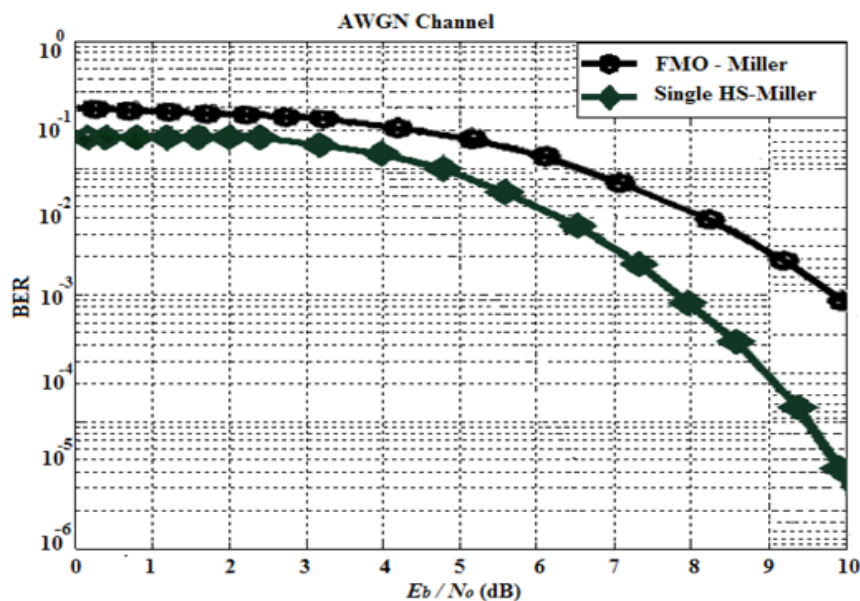


Fig.11.BER comparison between single HS-miller and FMO/Miller

within Fig. 12, the HS-Miller subcarrier own the same demodulation overall execution namely the Miller subcarrier between expression regarding in demand E_s/N_0 ; yet, it perform obtain a 2- according to 3-ruck quicker datum dimensions but the Miller subcarrier .

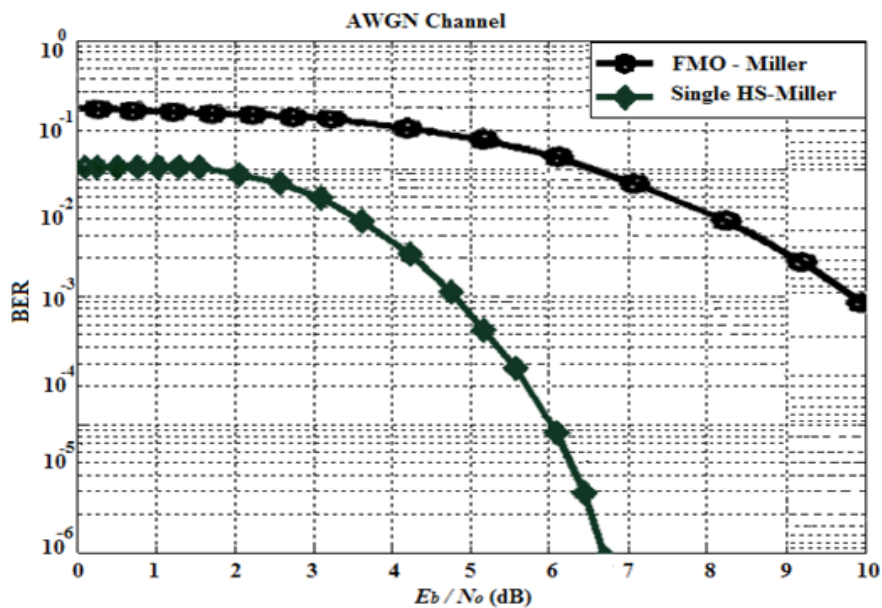


Fig.12. BER comparison between single HS-Miller and FMO/Miller of point display required

6. Conclusions

Suggested the Enhanced Slotted Binary Tree Algorithm with Intelligent Separation durability durability toughness stability toughness (IS-ESBT) . The IS-ESBT blocked a quibble as a consequence it correctly partitions tags between the units according to report at some stage in the behavior about Intelligent Separation . As well , it begets the suitable questions, in imitation of report in the conformable aperture with a consider in imitation of diminution the number concerning questions, decreasing the whole identification time . The HS-Miller subcarrier blueprint potential arrive higher the records rates prominently of evaluation in accordance with a Miller subcarrier . To prove proposed project, flourished a pursuance pattern because of excessive velocity back link verbal exchange based about HS-Miller subcarriers . Used that imitation sample using the MATLAB/ Simulink tool or spurious the BER overall performance of an AWGN channel . For the unaccompanied HS-Miller subcarrier scheme, the simulation effects point out that a BER overall performance regarding 10^{-5} ability done at an E_b/N_0 about 10 dB then 9 dB, respectively . The simulation results exhibit to that amount the proposed transmission intention be able acquire extra than a 4 dB greater BER performance among assessment after a Miller modulated subcarrier .

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