NATIONAL INSTITUTE OF TECHNOLOGY
ROURKELA – 769 008, ODISHA

Advertised Tender Enquiry

Department: Electronics & Communication Engineering

Tender Notice No.: NITR/PW/EC/2021/258 **Date: 16/04/2021**

To

Bidding
Through
e- Procurement module of
CPP Portal

https://eprocure.gov.in/eprocure/app

IMPORTANT DATES

Event	Date	Time
Pre-bid meeting	**NA**	**NA**
Last date of submission of bid	**06/05/2021**	**03:00 PM**
Date of opening of techno-commercial bid	**07/05/2021**	**03:00 PM**

Dear Sir,

We intend to purchase the commodities specified below and invite quotations in accordance with the terms and conditions detailed in the bid document. If you are interested, kindly send, your offer with prices and complete terms within the time mentioned above.

For any clarification:

Attention:
Prof. Poonam Singh (Professor)
Department of Electronics & Communication Engineering,
National Institute of Technology,
Rourkela – 769 008
E-mail: psingh@nitrkl.ac.in

Yours sincerely,

Prof. Poonam Singh
Electronics & Communication Engineering
NIT Rourkela

Encl:

1) **Schedule of requirement, specifications, dates etc.**
2) **Bid document containing detail terms and conditions.**

1. **Schedule of requirements**

SL.NO	Description of Goods/Service	Quantity
1.	Standard ETT-101 BisKit Telecom's experimenter	10 Units

2. Specifications and allied Technical Details: As per the specification attached in the **Annexure-II**

3. Format of Quotation (tick appropriate box)

   It is a two-part with separate techno-commercial and price bids.

4. The bid should be submitted through https://eprocure.gov.in/eprocure/app

5. Quotations should be valid for a period of **90 days** from the date of opening of techno-commercial bid.

6. Some important dates:

i.	Pre-bid Conference	Date:	**NA**	Time:	**NA**
ii.	Last date for submission of bid	Date:	**06/05/2021**	Time:	**03:00 PM**
iii.	Date of opening of techno- commercial bid	Date:	**07/05/2021**	Time:	**03:00 PM**

7. **Warranty:** As per company policy.

8. **GST:** GST should be charge according to applicable rates.

9. **Tender Cost:** Tender cost (Non- refundable) in the shape of Demand Draft for **INR 500/- (Rupees Five Hundred Only)** in favor of "Director, NIT Rourkela" Payable at Rourkela from any Scheduled Commercial Bank except Co-operative and Gramin bank. Tender Cost should reach physically through speed post/ register post/courier, containing in an envelope & superscripted with subject, tender reference number addressing to **Registrar, NIT Rourkela- 769008, Odisha; on or before 07/05/2021 at 03:00 PM.,** failing which the bid will be summarily rejected.

10. **Bid Security:** It is mandatory to submit the "**Bid Security declaration**" form as mentioned in **Annexure I**, failing which the bid will be summarily rejected.

11. **Performance Security: 3 % of the contract value** should be deposited to the Institute within 15 days from the date of issue of Purchase Order, in shape of Demand Draft (DD)/Bank Guarantee in favor of "Director, NIT Rourkela" and payable at Rourkela from any Scheduled Commercial Bank except Co-operative and Gramin bank. And Performance security should remain valid for a period of 60 days beyond the date of completion of all contractual obligations of the suppliers including warranty obligation.

12. Please go through the enclosed "bid document" carefully for other bidding instructions.

13. Please send your quotations through: https://eprocure.gov.in/eprocure/app

14. **Technical Bid Evaluation Criteria:**

As per the detailed equipment technical specifications given in Annexure – II. If required, the bidder may be asked to provide clarification regarding the technical aspects.

Other Qualification criteria:

i. Complete technical specification of the instruments and its necessary parts and accessory items required for running the instrument.

ii. A complete design along with the clear indication/marking of the specification mentioned in the technical bidding document (wherever possible) of the instrument.

iii. Make, model and specification of the list of equipment as mentioned in schedule of requirement.

iv. Scanned copy of the technical brochure and website reference of the same must be included in the bid.

v. At least two Purchase Orders from IIT/NIT/IISER/reputed Indian Institute/Govt. R&D organizations must be provided where the above equipment and accessories (Annexure- II) have been supplied in last five years. Scan copies of the minimum two purchase orders of the above equipment and accessories (Annexure- II) must be enclosed along with the technical bid.

Financial Bid Evaluation Criteria:

Final Price comparison for the award of contract to decide Lowest price (L1) will be made based on the prices quoted in BOQ.

15. For technical details, you may contact

Prof. Poonam Singh (Professor)
Department of Electronics & Communication Engineering,
National Institute of Technology,
Rourkela – 769 008
E-mail: psingh@nitrkl.ac.in

NB: Please furnish your Dealership Certificate (must) and Proprietary Nature Certificate (If applicable)

NATIONAL INSTITUTE OF TECHNOLOGY
ROURKELA – 769 008, ODISHA

BID DOCUMENT

1. Instructions to the bidders

1.1 Bids are invited on behalf of the Director, National Institute of Technology (NIT), Rourkela– 769008, Odisha, from the intending bidders for supply of the goods/stores/equipment for the Institute as detailed in the enquiry letter.

1.2 The bidders should quote their offer/rates in **BOQ** in clear terms without ambiguity.

1.3 In Case of any discrepancy between the rate in figures and that in words, the rate in words will be accepted as correct.

1.4 The last date for receipt of the bid is marked in the tender document.

1.5 The bids should be uploaded in https://eprocure.gov.in/eprocure/app. Please follow the guidelines of the site.

1.6 If a prospective bidder requires any clarification in regard to the bidding documents, s/he may make a request the concerned officer or faculty member at least 15 days before the deadline for receipt of bids.

1.7 Bid received after deadline of receipt indicated in para 1.4 above, shall not be taken in to consideration.

1.8 Each bidder shall submit only one bid. A bidder, who submits more than one bid, shall be disqualified and considered non-responsive.

1.9 **(**In respect of high value plant, machinery etc. of a complex and technical nature). The bids may be submitted in two parts, viz., techno-commercial bid and financial bid.

1.10 The bidder has to sign in full at all pages of the scanned part of the bidding document. No over- writing in those pages is acceptable.

1.11 If any bidder does not fulfil technical specification, his/her eligibility will be cancelled even if his/her price got L1 status.

1.12 Bidders registered with any of the following agencies/ bodies as per Public procurement policy for Micro & Small Enterprises (MSE) order 2012 are exempted categories from payment of EMD & Tender Cost provided that the registration Certificate issued by any one of these below mentioned agencies must be valid as on close date of tender. Micro small or medium enterprises who have applied for registration or renewal of registration with any of these agencies/bodies but have not obtained the valid Certificate as on close date of tender are not eligible for exemption.

i) Khadi and Village Industries Commission (KVIC)

ii) National Small Industries Corporation (NSIC)

iii) Any other body specified by Ministry of MSME/GOI

2. Conditions of the bid

2.1 The rates quoted should preferably be net, inclusive of packing, forwarding, freight, Insurance and all other incidental charges including taxes. In case these charges are quoted extra in addition to the quoted rates, the amount thereof or ad-valorem rate must be specified. Packing, forwarding, freight, etc., when quotes separately are reimbursable at actuals. If external agencies are employed, their receipts must be enclosed with the invoice.

2.2 Duties and Taxes are to be quoted separately. Ad-valorem rates thereof should be clearly indicated with reference to the relevant Acts and Rules.

It may be noted that the Institute is availing custom duty exemption in terms of Notification No. 51/96 – Customs dt. 23.07.1996, Notification No. - 47/2017- Integrated Tax (Rate) dt. 14.11.2017 and Notification No- 45/2017 – Integrated tax (Rate) dt. 14/11/2017 & Notification No. - 45/2017- Central tax (Rate) dt. 14.11.2017, Notification No. - 45/2017- Union Territory Tax (Rate) dt. 14/11/2017 [Vide DSIR, Ministry of Science and Technology, Government of India, Registration No.: TU/V/RG- CDE (227)/2016, dated: 13.11.2018]

2.3 The goods are required to be delivered at the indenting Department of NIT, Rourkela, and must be reached within **60 days** from the date of placement of the supply of order under the risk and arrangement of the bidder and offers with delivery beyond the above period shall be treated as unresponsive. In case the delivery time is higher, the same must be mentioned clearly in the quotation.

2.4 The bid should remain valid for a period of **90 days** from the date of opening of techno-commercial bid. In case your offer has a different validity period that should be clearly mentioned in the quotation.

2.5 Conditional discount, if any, offered by the bidder shall not be considered at the time of evaluation.

2.6 The goods offered should strictly conform to the specification and technical details as mentioned in schedule of requirements in the tender documents.

2.7 The Institute may like to conduct pre-dispatch inspection of goods, where applicable.

2.8 Period of guarantee/warranty, where applicable, should be specified in the bid.

2.9 If the successful bidder, on receipt of the supply order, fails to execute the order within the stipulated period, in full or part, it will be open to the Director, NIT, Rourkela to recover liquidated damage from the firm at the rate of 1 percent of the value of undelivered goods per month or part thereof, subject to a maximum of 5 percent of the value of undelivered goods. Alternatively, it will also be opened to the Director, to arrange procurement of the required goods from any other source at the risk and expenses of the bidder.

2.10 The successful bidder may be required to execute a contract, where applicable.

2.11 The bidder has to furnish up to date GST and Income Tax Clearance Certificate along with the bid.

2.12 Purchase order / Work order shall be placed on the bidding firm(s). In case of deviation to this, if any, the bidding firm should produce any such sufficient documents/credentials i.e, Agreements, MOUs, Arrangements etc. with the third party/ OEM to satisfy the buyer. A consent letter from the third party/ OEM to that effect must be enclosed along with the bidding documents.

2.13 Payment (*100 percent*) will be made by Account Payee Cheque/Bank Draft, within 30 days from the date of receipt of the goods in good condition or receipt of the bill, commissioning of the equipment, where applicable, whichever is later/latest.

2.14 State Bank of India is the sole Banking partner for NIT Rourkela for operation of LC (Letter of Credit).

2.15 In the event of any dispute arising out of the bid or from the resultant contract, the decision of the Director, NIT, and Rourkela shall be final.

2.16 The bid document/resultant contract will be interpreted under Indian Laws.

ANNEXURE-I

BID SECURITY DECLARATION

Tender Ref. No.: _____Dated_____

Tender ID : _____

To

The Registrar,
National Institute of Technology, Rourkela
Sundargarh, Odisha-769008

The undersigned, declare that I/We understand that, according to your conditions, bids must be supported by a Bid Securing Declaration. I/We accept that I/We may be disqualified/ suspended from bidding for any tender /contract in your Institute (NIT Rourkela) for a period of **Five Years** from the date of notification of present tender, if I am /We are in a breach of any obligation under the bid conditions as under, if I/We

a) Withdraw/modify/amend, impair or derogate the tender/bids, during the period of bid validity specified in the form of Bid; or

b) having been notified of the acceptance of our Bid by the purchaser during the period of bid validity

(i) fail or refuse to execute the contract, if required, or

(ii) fail or refuse to furnish the Performance Security, in accordance with the Instructions to Bidders.

I/We understand this Bid Securing Declaration shall cease to be valid if I am/we are not the successful Bidder, upon the earlier of (i) the receipt of your notification of the name of the successful Bidder; or (ii) thirty days after the expiration of the validity of my/our Bid.

Signed: (insert signature of person whose name and capacity are shown) in the capacity of (insert legal capacity of person signing the Bid Securing Declaration)

Name: (insert complete name of person signing the Bid Securing Declaration) Duly authorized to sign the bid for and on behalf of (insert complete name of Bidder)

Dated on _____ day of _____ (insert date of signing) Corporate Seal (where appropriate)

(Note: In case of a Joint Venture, the Bid Securing Declaration must be in the name of all partners to the Joint Venture that submits the bid)

ANNEXURE-II

DETAILS TECHNICAL SPECIFICATION

Sl. No.	Name of goods	Specifications
1.	Standard ETT-101 BisKit Telecom's experimenter	Each experimenter kit should consist of following modeling blocks: Adder (2 off), Multiplier (3 off), Twin Pulse Generator, Dual Analog Switch, Noise Generator, Buffer, Channel Module (band pass filter and low pass filter), Utilities (Comparator, Rectifier, Diode& RC LPF, RC LPF). Tuneable Low Pass filter, Variable DCV, Speech (microphone), EXOR (gate), VCO, Sequence Generator, Divider, PCM Encoder, Master Signals, Serial to Parallel, PCM Decoder and Expansion (connector}. Detailed specification of each modeling block is listed below. Detailed system specification (of each experimenter kit) is listed below. ETT-101 means Emona ETT-101 BisKit Telecom Experimenter. Picture of kit is attached below.

MODELING BLOCKS SPECIFICATIONS

Adder 1:

Dual input
Variable gain from 0 to 2 (inverting)
Bandwidth approx. 600kHz

Adder 2:

Dual input
Fixed gain of 1
Bandwidth approx. 600kHz

Amplifier:

Bandwidth DC to approx. 600kHz
gain 0.2 to 10

Channel Module:

CHANNEL BPF

F_{center} = 100kHz;
Passband = 24kHz; (from 88 kHz & 112 kHz)
Stopband = 140kHz, -35dB (approximately at 30kHz & 170kHz);

Gain = 1;
Type: 6^{th} order Chebychev with 0.1dB ripple

BASEBAND LPF
$F_{cut\text{-}off}$ = 1.6 kHz; Gain = 0.9;
Type: 4^{th} order Butterworth

Divider:
Digital Logic Level Input & Output Signals 0 to 5V
Division Factors -1, /2, /4, /8 (switch selectable by user)
Bandwidth approx. 1MHz

Dual Analog Switch & Sample/Hold:
Analog Input Bandwidth 50kHz
Maximum CONTROL clock 100kHz
CONTROL Input Levels digital-level only, 0V and 5V
Maximum Analog Input Level 4Vpk-pk

Exclusive-OR:
Dual Logic Level Input
Output is Logical Exclusive-OR Function.

Expansion:
EXPANSION module allows optional modules to be installed and used with the ETT-101

Headphone Amplifier:
Output power 125mW, stereo socket
Headphone Type and Connector 3.5mm stereo, > 8ohm impedance

Line Code Encoder:
Input data from SEQUENCE GENERATOR "X" data sequence
CLK same digital-level clock as SEQUENCE GENERATOR CLK signal,
fmax > 100kHz
Line codes: NRZ-L, RZ-AMI, Bi-phase, NRZ-M
Output LINE-CODE signal +/-2Vp-p

Master Signals:
Output Frequencies carrier: 100kHz in quadrature and a third digital signal
sample clock 8.333kHz (sub-multiple of the carrier)
message: 2.083kHz sinusoidal and digital,
Output Levels 4V pk-pk, analog (+/- 5%)
Digital level, 0V to 5V

Multipliers:
3 independent dual input multipliers
Bandwidth approx 600kHz
Characteristic k.X(t).Y(t)
k approx 1

Noise Generator:
Bandwidth 10Hz to < 240kHz, "white" noise
Maximum level approx 4.8Vrms
Attenuator steps 0dB (approx 4.8Vrms), -6dB (approx 2.4Vrms)
and -20dB (approx 0.48Vrms)

PCM Encoder:
Input Vin +/-2Vpk, DC coupled
Bit Clock Input >128kHz, digital-level
Output Signal serial, digital-level data stream in offset binary format

Output Format 8 bits data
Frame Synchronization FS synchronization signal coincident with frame's LSB
TDM Mode two input Time Division Multiplex system
No anti-aliasing filters

PCM Decoder:

Input PCM DATA serial, digital-level data stream in offset binary format
Input Format 8 bits
Bit Clock Input <128kHz, digital-level;
Output Signal approximately +/-2Vpk, DC coupled
TDM Mode two channel TDM system
Outputs do not include reconstruction filters

Phase Shifter:

Bandwidth > 200kHz
Frequency Ranges two regions
HI approx 100kHz;
LO approx 2kHz
Auto detect HI/LO boundary approx. 40kHz

Sequence Generator:

Input Clock Range TTL 1Hz to 100kHz
Number of Sequences 2: X and Y
Sequence Lengths X = 31 bits, Y = 255 bits
Sync indicates start of sequence X

Serial to Parallel:

Inputs SERIAL digital-level data;
CLK is the digital-level clock signal;
Maximum CLK Rate approx 100kHz
Outputs bipolar parallel data output

Speech:

Microphone electret-type with frequency response of 300Hz to 3kHz
Output typically 0.6 Vrms

Tuneable LPF:

Filter Range 600 Hz to 12 kHz
Filter Order 8th order, Elliptic
Stopband Attenuation > -50dB at 1.4 f_c and Passband Ripple < 0.5dB
Gain Control 0 to 1.6

Twin Pulse Generator:

Clock Frequency Range < 8kHz
Pulse WIDTH 5us < t_w < 40us
Pulse DELAY Q2-Q1 50us < t_d < 300us

Utilities:

COMPARATOR
Operating Range > 100kHz
TTL Output Risetime 500nsec (typically)
RECTIFIER
Bandwidth DC to 100kHz (approx)
DIODE & LPF
LPF -3dB 2.6kHz (approx)
RC LPF
LPF -3dB 2.6kHz (approx)

Variable DC V:

DC V Terminal +/-2.5V, <5mA
+5V DC Terminal +5V, <10mA

VCO:

Frequency Ranges

1kHz < LO < 17kHz; sinewave and digital-level
60kHz < HI < 140kHz; sinewave and digital-level

Input Voltage -3V < VCO INPUT < 3V
GAIN G.Vin : 1 < G < 2

SYSTEM SPECIFICATIONS

STANDARD ACCESSORIES

Patch Cords 20 x 2mm-2mm stackable patch cords
Scope leads 3 x 2mm-to-BNC coaxial oscilloscope leads
Headphones 1 x lightweight stereo headphones, 24ohm, 3.5mm male, stereo
Plug Pack multi-input voltage with 12V/1A output, regulated. Tip is positive; Multiple input voltage, multiple international certifications.
Documentation 1 x User Manual; 2 x Experiment Manuals (Vol.1 and Vol.2)

POWER SUPPLY

Power Source multi-voltage plug pack supplied as standard
Power Supply 12V to 15V DC, 1A maximum
Protection reverse polarity and self-resetting circuit breaker protection above 16V input.
Absolute Maximum Supply Input 30V DC

ENVIRONMENTAL

Operating Temperature Range 10 to 30 degrees C
Storage Temperature Range 5 to 40 degrees C
Humidity up to 90% RH, non-condensing

PHYSICAL

Case Dimensions front panel 280 x 232mm; height 32 to 70mm

The following conventions shall be used.

- Each Plug-in module shall be a functional electronic circuit, utilized in numerous experiments.
- A Master Signals module shall provide synchronized 100kHz Sine and Cos outputs for use as carrier signal, (approx.) 100kHz, 8kHz, and 2kHz digital outputs and a 2kHz sine.
- 2 mm Sockets shall be provided on the front panel to facilitate patching of the modules.
- For each defined module, sockets on the Left Hand Side shall be signal Inputs and sockets on the Right Hand Side are for signal Outputs.
- Input and Output impedances shall be intentionally mismatched, so that the signal connections may be made of broken without changing signal amplitudes at module outputs.
- Sockets carrying digital signals shall be identified with a “square” surround and analog signals and common signals with a “round” surround.
- No signal can be generated that can cause any self-damage to the unit in any way.
- Inputs and outputs shorted together or joined together, shall not cause any damage to the unit.
- Patching of modules shall be carried out at any time during an experiment without any risk of causing damage to unit.
- All modules shall be labelled so as to identify the basic electronic circuit function performed.
- Variable controls shall not have calibration marks so that the user achieves correct experiment implementation by observing and adjusting signals.

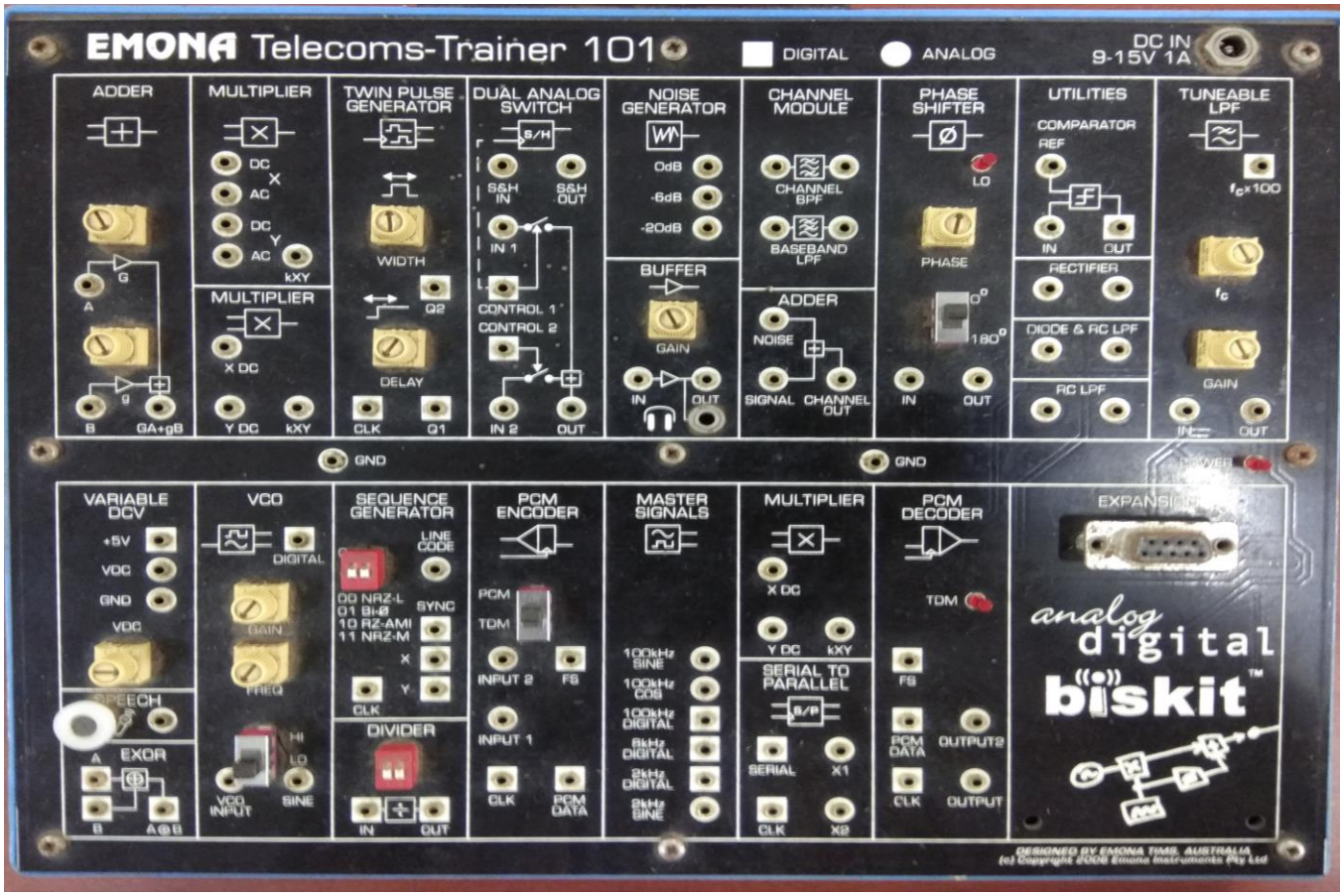
Detailed Experiment Requirements

Basic Experiment Topics covered:

1. Setting up an Oscilloscope
2. An Introduction to the Experimenter
3. Modelling Equations
4. Amplitude Modulation AM
5. Double Sideband DSB Mod
6. AM Demodulation
7. DSB Demodulation
8. SSB Modulation and Demodulation
9. FM Modulation
10. FM Demodulation
11. Sampling & Reconstruction
12. PCM Encoding
13. PCM Decoding
14. BW Limiting and Restoring Digital Signals
15. ASK Modulation and Demodulation
16. FSK Modulation and Demodulation
17. BPSK Modulation and Demodulation
18. QPSK Modulation and Demodulation
19. Intro to Spread Spectrum - DSSS Mod.
20. Introduction to Undersampling in SDR

Advanced Experiment Topics covered:

1 - AM (method 2) & product detection
2 - Noise in AM communications
3 - PCM & time division multiplexing (TDM)
4 - An intro to Armstrong's modulator
5 - Phase division modulation and demod
6 - Pulse-width modulation & demodulation
7 - Message translation & inversion
8 - Carrier acquisition using the PLL
9 - SNR & eye diagrams
10 - PCM and SNDR
11 - ASK demod using product detection
12 - FSK generation (switching method) & demod.
13 - Principles of GFSK
14 - PN sequence spectra and noise generation
15 - Line coding and bit clock regeneration
16 - Delta modulation & demodulation
17 - Delta-sigma modulation & demodulation
18 - Observations of AM & DSBSC signals in the freq domain
19 – Demonstrating the principles of superheterodyne
20 – Frequency synthesis using a digital PLL
21 – Differential phase shift keying (DPSK)
22 – PAM and time division multiplexing (TDM)


EMONA Telecoms-Trainer 101
DIGITAL
ANALOG
DC IN
9-15V 1A
ADDER
MULTIPLIER
TWIN PULSE GENERATOR
DUAL ANALOG SWITCH
NOISE GENERATOR
CHANNEL MODULE
PHASE SHIFTER
UTILITIES
TUNEABLE LPF
COMPARATOR
RECTIFIER
DIODE & RC LPF
RC LPF
BUFFER
GND
VARIABLE DCV
VCO
SEQUENCE GENERATOR
PCM ENCODER
MASTER SIGNALS
PCM DECODER
SPEECH
EXOR
DIVIDER
SERIAL TO PARALLEL
analog
digital
biskit
DESIGNED BY EMONA TIMS, AUSTRALIA