

## Technical Data

### Input signals

**Analog**  
Physical interface: 2-wire twisted pair  
Input level: -50 dBm bis +15 dBm  
Frequency range: 300 Hz to 3400 Hz  
Input impedance: selective high resistance or 600 Ω

### E1 - Interface

Physical interface: 4-wire twisted pair with 120 Ω termination according to ITU-T G.703  
Data structure: non structured or structured according to ITU-T G.704  
Line code: HDB3  
Input level: max. 5.5 V  
Data rate: 2048 kbit/s ± 50 ppm

### VoIP

Physical interface: Ethernet interface with Twisted Pair according to IEEE-802.3  
Data rate: Ethernet 10 Mbit/s, Fast Ethernet 100 Mbit/s

### Output signals

#### Analog

Physical interface: 2-wire twisted pair  
Output level: -50 dBm to +15 dBm (@ adjustment of level 0 dB)  
Frequency range: 300 Hz to 3400 Hz (-3 dB)  
Output impedance: 600 Ω  
Channel amplification: 0 dB ± 0.1 dB  
Input to output: 0 dB (-20 dB @ adjustment of level)

#### E1-Interface

Physical interface: symmetrical, termination 120 Ω according to ITU-T G.703  
Data structure: non structured or structured according to ITU-T G.704  
Line code: HDB3  
Output level: 3 V  
Data rate: 2048 kbit/s ± 50 ppm  
Tolerance: 50 ppm  
Frame frequency: 8000 frames/s  
No. of Bits pro time interval: 8 bits

#### VoIP

Physical interface: Ethernet interface with twisted pair according to IEEE-802.3  
Data rate: Ethernet 10 Mbit/s, Fast Ethernet 100 Mbit/s

#### Filter

Broad band: Band pass with limits at 300 Hz and 3400 Hz  
Low frequency filter: Band-stop at 2040 Hz, low pass at 3160 Hz and high pass at 300 Hz  
2040 Hz: Band pass at 2040 Hz  
EK: High pass at 3140 Hz

#### Signal generators

Signal shape: Sinus  
Signal level: -50 dBm to +10 dBm in 0.1 dB steps  
Signal generators intern: 1000 Hz, Tone code 2040 Hz, Radio reception criteria: 3180 Hz, 3210 Hz, 3300 Hz, 3390 Hz, variable from 300 Hz to 3400 Hz (1 Hz steps)  
Signal generators extern: 1000 Hz, Tone code 2040 Hz, Radio reception criteria: 3180 Hz, 3210 Hz, 3300 Hz, 3390 Hz, variable from 300 Hz to 3400 Hz (1 Hz steps)  
Signal output EXT1, EXT2: symmetrical, output impedance 600 Ω each

#### E1-Measurements

Provided PRBS: 26-1, 29-1, 211-1, 215-1, simply 1's, simply 0's, alternate 1010..., self configured sequence up to 32 bit.  
Measurement of bit error rates: 1 to  $10^{-10}$   
Statistic of bit error rates: Total measurement time, number of bit-errors (ER), Bit error rate (BER), number of disturbed seconds absolute and percental (Error Seconds ES, %ES), highly disturbed seconds with BER  $\geq 10^{-3}$  absolute and percental (Severely Error Seconds SES, %SES)  
Alarm statistic: Signal Loss, Frame Loss, and AIS

#### Data memory E1

The data memory is used in the E1 mode. Therefore a memory-stick has to be inserted into the USB-interface. The data are then stored direct on the memory stick. The corresponding display light up green in the "recording mode".

#### Features

Saving of the current measured values and faulty statistics. The measured data will be saved in a txt-file on the memory stick.

#### Memory time interval

The time interval of the storage may be selected between 1 sec and 100 hours. The selected time interval "0" will store only this events when a variation occurs. The measurement mode "Loop" and "Analyse" will store: Alarm-Status LOS, LOF, FAS, CRC4, AIS, RAIS and the CAS Signalling. The measurement mode "BER" and "BER EXT" will store: Alarm-Status LOS, LOF, FAS, CRC4, AIS, RAIS as well as the bit error rates BER, ES and SES.

#### Technical implementation

The MTBF of the device is more than 20'000 hours.  
Die GFPE 2010 has been developed and manufactured according to the appropriate regulations of VDE, CCIR, DIN, CE, ETSI EN 301 489-22.

#### Software

Software-Updates may be done by the USB-interface.

#### Conditions of operation

Operating temperature: 0 °C to +55 °C  
Air humidity: 30 % to 60 % @ 20 °C  
Storage temperature: -20 °C to +70 °C

#### Power supply

Power supply: 100 VAC ... 260 VAC  
Switch-on current:  $\leq 3 \dots 4 \times I$  nominal  
Power factor:  $> 0,9$  inductive resp.  $> 0,9$  capacitive  
Leakage current (against PE):  $< 1$  mA @ 1 A nominal  
MTBF:  $> 20'000$  h  
Isolation input to output:  $> 3$  kV eff

#### Security:

Power fail bridging time: EN 60950, VDE 0805, and VDE 0100  
stability:  $> 20$  ms @ 100 % load and  $U_e = 187$  V  
EN 50082-2: 1992

#### Standards:

EN 61000-4-2/3/4/5, severity level 4, EN 61000-4-11, EN 50081-1:1992, EN 55011, EN 55022

#### Mechanical construction

Housing: 19" Rack with handles  
Size: 4 HE  
Depth: 340 mm  
Wight: ca. 9.2 kg



# Air Traffic Control & Radio Channel Test System

## GFPE 2010

# Air Traffic Control & Radio Channel Test System – GFPE 2010

The communication between the air-traffic controller in the control tower and the pilot on board of his aircraft is operated by voice radio. This voice communication mainly transmits information on flight situation, position of the aircraft, altitude, air speed, ore such like.

The legal basis for the application of the aeronautical mobile service is defined in their respective regulations.

The most important monitoring unit besides the radar is the aircraft radio. Therefore the idea of safety is a cornerstone for the whole air-traffic control system with highest requirements regarding reliability and availability.

**Channel selector: K1 ... K5**

**Mode of measurement selection: Analog, E1, VoIP, frequency generators**

**Filter selection: Broadband, low-frequency, band-pass 2040 Hz, EK**

**600 Ohm termination**

**Coloured 5.7 inch TFT Touch Display**

**"up"-Cursor**

**"down"-Cursor**

**Navigation wheel**

**"Esc" button**

**Data recording**

**Monitoring loudspeaker**

**Monitoring features**

**Volume control**

**Generators internally shiftable**

**USB-interface**

**Generator external**

**Generator external outputs EXT1, EXT2**

**Display of the radio reception criteria**

**Tone code display**

**Analog input channels K1 ... K3, K4 and K5 backside**

**Analog output channels K1 ... K3, K4 and K5 backside**

**20 dB - attenuation for analog input channels**

**Digital In-, Output D1 for E1 and VoIP**

**LED-brilliancy**

**LED test**

**Measurements of the digital E1-channel bit-error-test, E1-loop, E1-analyze**

**Power ON, OFF**