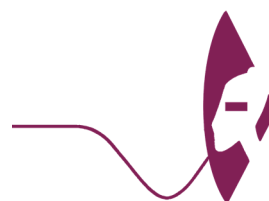


MAG_200/TGS-R

MAGALI RACK-MOUNT TELEMETRY GROUND STATION



DESCRIPTION

MAG_200/TGS-R is a rack-mount telemetry ground station. It performs signal reception, bit and frame synchronisation, storage and real time data processing.

MAG_200/TGS-R includes Magali Telemetry software with PCM decommutation module selected from IRIG 106 Class II, CE83, CCSDS for a **processing of up to 50 000 parameters** .

The solution is upgradable to include other data format as numerical buses (MIL-STD-1553, ARINC 429...) Video, Chapter 10 or Ethernet data acquisition: IENA, iNet, Zodiac Data System RTR, raw telemetry packets ...

KEY FEATURES

- **Telemetry room** applications
- From **1 to 4 PCM** inputs
- PCM Data Rates up to **20 Mbps** for NRZ-L (10 Mbps for Bi-Phase/ Miller)
- **Receiver, Bit synchronizer, PCM decom**, PCM simulator, time code reader/generator
- **Up to 50 000 parameters processed**
- **Magali** telemetry software
- Available with MIL-STD-1553, ARINC 429 and other inputs of Magali products

SPECIFICATIONS

RECEIVER (OPTION)

Tuner Features

Input frequency-S-band	2200 - 2400 MHz
Input frequency-E-band	2185 - 2485 MHz
Input frequency-U-band	1710 - 1850 MHz
Input frequency-L-band	1435 - 1540 MHz
Input frequency-P-band	215 - 320
IF Bandwidths	12 or 4 among 0.5, 1, 1.5, 2.5, 3.5, 4, 6, 8, 10, 12, 16, 20 MHz
Tuner resolution	50 kHz
Frequency accuracy	0.002%
Noise figure	8 dB (maximum) ; 6 dB (typical)
Operating Input Level	-10 to threshold
Maximum input level	+ 18 dBm without damage

Demodulator Features

Demodulation type	AM and FM
Post detection BW	12 or 4 software Selectable Video Filters. Unless otherwise specified they will be set for 50% of the IF Bandwidths.
Data Output Level	BI-polar (with software controlled output level to +/- 3.5Vpp) with 75 Ohm output impedance

Demodulator (more) Features

AGC Output	0-4 V into 1K Ω , 0 V is -100 dBm, +4V is 0 dBm
AGC time Constant	4 selectable time constants 1, 10, 100, 1000 ms
AGC Linearity	+/- 2 dB into best fit straight line -15 dBm to threshold +5 dB
AM Output	4 Vp-p into 10 K Ω ; 2.5 Vp-p into 75 Ω
AM frequency response	Selectable AM Low Pass Filter for 50, 500, 5K and 50 KHz

Additional Inputs/Outputs

AGC Controlled	-15 +/- 5 dBm signal
70 MHz IF	into 50 Ohms
Linear 70 MHz IF	35 dB Gain (typ) into 50 Ohms. Max output of +5 dBm

Bus Outputs

Signal Strength and Peak deviation
AM modulation Depth
AM Frequency

BIT SYNCHRONIZER

PCM Codes

Codes
Randomized codes
Randomized sequences

PCM Codes

NRZ-L, NRZ-M, NRZ-S, RZ, BIO-L, BIO-M, BIO-S, DM-M, DM-S, M ² -M, M ² -S
RNRZ-L, RNRZ-M, RNRZ-S
2 ¹¹ -1, 2 ¹⁵ -1, 2 ¹⁷ -1, 2 ²³ -1

Input and Signal features

Input signals	Single-ended or differential
Impedance	75 W (default), 50 Ω , 1K Ω (Jumper Select)
Polarity	Auto-detect (normal or inverted)
Signal Amplitude	0.4 V pp to 10 V pp (nominal)
Maximum Voltage Input	5V RMS for 50 Ω and 75 Ω Inputs; 25V RMS for 1K Ω Impedance
Maximum DC Offset	\pm 5V for 50 Ω and 75 Ω Inputs; \pm 25 V for 1K Ω Impedance
Dynamic AC baseline variation	100 % of the input signal with a frequency of up to 0.1% of the signal frequency for sinewave or sawtooth signals (100 Hz maximum).

Performances

Bit rate	100 bps to 20 Mbps for NRZ codes - 100 bps to 10 Mbps other codes
Loop-Bandwidth	Programmable from 0.01% to 2 % depending on the Bit Rate of the input
Acquisition Range	0.04 % to 8 % depending on the Loop-Bandwidth selected

Bit Error Rate Performance

The Bit Synchronizer performance relative to theoretical is indicated below when the applied signal has an S/N ratio within 1 dB of the specified synchronization threshold with a Gaussian white noise bandwidth up to three times the bit rate, and has no jitter or base line variations on the input signal.

Code	Bit Rate	Degradation from Theoretical
NRZ	<10 Mbps	<1 dB maximum (0.5 dB typical)
NRZ	10 to 20 Mbps	<1.5 dB maximum (1dB typical)
BIO, RZ	<5 Mbps	<1 dB maximum (0.5 dB typical)
BIO, RZ	5 to 10 Mbps	<1.5 dB maximum (1 dB typical)
DM, M ²	up to 10 Mbps	<2 dB maximum (1 dB typical)

Synchronization Hold

The Bit Synchronizer is capable to maintain synchronization during periods of a signal loss or during continuous periods of 1s or 0s lasting up to 245 bits in every 1024 bits for NRZ coded signals up to 5 Mbps or BIO coded signals up to 2.5 Mbps, providing :

- S/N ratio is greater than 12 Db
- PLL Bandwidth is equal to .01%
- 50% Transition Density when the signal is present
- Signal has no jitter or base line variations on the input signal
- Signal has a constant amplitude

Acquisition Time

The average acquisition time is a function of the Loop Bandwidth and will be less than 100 bits with a Loop Bandwidth of 1 % and less than 150 bits with a Loop Bandwidth of 0.1 % for NRZ coded signals up to 5 Mbps or BIO coded signals up to 2.5 Mbps, providing:

- Gaussian white noise in a band up to three times the bit rate
- Transition Density less than 2 % of the bit rate
- Signal has no jitter or baseline variations on the input signal

Output Signals

Data	TTL and RS-422
Zero Degree Clock	TTL and RS-422
Tape outputs	1 V pp into 50 Ω (code programmable) TTL and RS-422
Lock Status	In status register
ES/No > 5 dB Status	In status register
Input Signal Level Status	In status register
Built-in-test	In status register

FRAME SYNCHRONIZER

Inputs	NRZ-L
Input Levels	TTL or RS 422
Input Data Rate	10.0 bps to 20.0 Mbps
Word Length	3 to 16 bits (32 bits with software)
Minor Frame Length	2 to 16383 words per minor frame
Major Frame Length	1 to 1024 minor frames per major frame
Bit Order	MSB/SB (word-by-word basis)
Frame Sync Pattern	Up to 64 bits
Frame Sync Location	Leading or trailing the frame
Frame Sync Strategy	Adaptive mode (search-lock-verify) & burst mode (search-lock)
Sync Error Tolerance	0 to 16 bits
Sync Slip Window	1 to 3 bits wide
Data Polarity	Normal, inverted or automatic (detection)
Sub-Frame Sync	FCC, SFID or URC (option)

IRIG TIME CODE/GENERATOR

Inputs	IRIG A, B or G
Input levels	250 Hz or 20 KHz, 1 V (peak to peak nominal)
Latency	2 μ s maximum

SIMULATOR

Outputs Data	0° & 90° clocks
Output Levels	TTL or RS 422
Output Data Rate	1.0 Bps to 20.0 Mbps (NRZ codes)
PCM codes	NRZ-L/M/S, BIO-L/M/S, DM-M/S, M2, RNRZ-L-11/15
Word Length	3 to 16 bits
Minor/Major Frame Length	2 to 16383 words
Major Frame Length	1 to 1024 minor frames
Bit Order	MSB/LSB-first on a word-by-word basis
Sync	Up to 64 bits
Sub Frame Sync	FCC, SFID & URC

SOFTWARE

IRIG 106	Class II Full compatible
Frame output	Chapter 10 and Raw format
Export	ASCII, MATLAB, CSV, Google Earth...
Import	ASCII, BINARY, CSV...
Main functions	Data acquisition/replay, real time, visualization, post processing, analysis, report
Network	Distributed Architecture
Tools	Kalliste synoptic editor, SDK...

CONTROLLER

Type	Industrial server, 4 U rack-mount
Processor	Intel® Core™ i3-i5-i7 , 3.2 -3.33-2.8 GHz
Memory	4 Go DDR3 10600
Disk	500 Go
Slot	1 PCIe x 16, 3 PCIe x 1, 1 PCIe x 4, 7 x PCI 32/33 MHz
DVD-RW	Sata
Floppy	3.5" (option)
Network	DUAL LAN (Intel), 10/100/1000 Mbps
VGA	NVIDIA G210
USB	2 x USB 2.0 (front) ; 6 x USB 2.0 (Back side),
size W x D x H	482 x 472 x 177 mm
Weight	Approx. 15 kgs
Operating system	Windows 7 32-bit or 64-bit

ORDERING INFORMATION

MAG-200/TGS-R/1/XXX ⁽¹⁾	1 telemetry stream ground station
MAG-200/TGS-R/2/XXX ⁽²⁾	2 telemetry stream ground station
MAG-200/TGS-R/3/XXX ⁽²⁾	3 telemetry stream ground station
MAG-200/IENA	IENA Ethernet module
MAG-200/iNet	iNet Interface
MAG-200/A_1553 ⁽²⁾	1553 interface
MAG-200/A_A429/8 ⁽²⁾	8 Arinc429 channels interface
MAG-200/Ch10	IRIG 106 Chapter 10 format interface
MAG-200/3D_VIRTUAL	3D Visualization - With standard 3D mobile and 3D terrain

⁽¹⁾ Decommutation module : IRIG, CE83, DANIEL, CCSDS

⁽²⁾ 6 PCI Slot controller. Not compatible with battery powered option

*Specifications are subject to change.
Please, verify the latest specifications
prior order.*

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