ELBER
WIRELESS INSIGHT

CLEBER DVB-S/S2 Multistream Modulator



CLEBER-MS2 R12K14

DESCRIPTION

Cleber offers a powerful, flexible and modular hardware and software platform for broadcast operators, where customers can install up to six boards with no limitations in terms of position. Based on a Linux embedded OS, Cleber detects the presence of the boards and shows the related control interface to the user, either through web GUI and Touchscreen TFT display. Both AC and DC power supplies option are provided, as well as redundant configurations.

MS2 is a satellite modulator board to be installed in the Cleber platform; compliant with DVB-S and DVB-S2 standard, it also manages roll-off downto 0.05 (DVB-S2X).

Basic board accepts 2 input streams over ASI: in single stream configuration, a seamless switch between the two inputs is provided; in multi-stream configuration, the streams can be associated to different Input Stream Identifier (ISI) as per standard. The basic board can be integrated with an extension board (MS2E), adding 4 more input streams; furthermore, two more streams can be fed to the modulator through internal bus, coming from local encoders, satellite receiver, ASI or IP bridge boards (optional plug-in modules for CLEBER), achieving a maximum of 8 input streams.

Two output connectors are available: the main one covers the L-Band between 950 and 2150 MHz, the second offers an additional IF output (70-140 MHz synthesizable), besides a L-band monitor signal. By software, it is possible to enable 10 MHz reference for external BUC across the L-band output, optionally with high-stability OCXO.

Maximum Symbol Rate is 49.5 MBaud and all modcods are available as per standard; output power is configurable over an extended range, -40 up to +8 dBm, with excellent MER.

FEATURES

- Self-contained compact solution (1U Rack 19”)
- Six plug-in slots available for any combination of boards
- DVB-S/S2 Modulator
- Single and Multistream
- L- band and IF output
- 10 MHz reference for BUC
- Optional high stability OCXO
- TFT front panel control
- Embedded Linux OS
- Redundant power supply (AC and/or DC)
- WEB interface, SNMP v2 and GPIO

SPECIFICATIONS

Modulation:

Standard: ETSI EN 300 421 (DVB-S)
ETSI EN 302 307 (DVB-S2)

DVB-S
- Outer FEC: Reed Solomon
- Inner FEC: Viterbi
- MODCODs:
  - QPSK: 1/2, 2/3, 3/4, 5/6, 7/8
  - 8PSK: 2/3, 5/6, 8/9

DVB-S2:
- Outer FEC: BCH
- Inner FEC: LDPC
- MODCODS:
  - QPSK: 1/4, 1/3, 2/5, 1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 8/9, 9/10
  - 8PSK: 3/5, 2/3, 3/4, 5/6, 8/9, 9/10
  - 16APSK: 2/3, 3/4, 4/5, 5/6, 8/9, 9/10
  - 32APSK: 3/4, 4/5, 5/6, 8/9, 9/10

Symbol Rate Range: 0,05 – 49,5 Mbaud

Frame length:
DVB-S/DSNG: 188 bytes
DVB-S2: Short Frames 16200 bits
Normal Frames 64800 bits

Roll-off factor: 0,05-0,10-0,15-0,20-0,25-0,30-0,35

Input Interface:

Back panel: 2 ASI inputs on BNC (F) - 75 ohms
Internal Bus: 2 balanced ASI lines (*option, AB01 board required*)
Extension: 4 balanced ASI lines from extension board (*option, MS2E board required*)
ASI Format: 188 and/or 204 byte mode
ASI Multistream interface:
- Up to 8 ISI
- Rate adapter

Output Interface:

L-band output:
Connector: F (F), 50 ohms or SMA (F). 50 ohms
Return loss: > 14 dB
Level: -40/+8 dBm (+/- 2 dB)
Frequency: 950 - 2150 MHz (10 Hz steps)
Spurious: Better than -65 dBc/4 kHz @ +5dBm
Phase Noise with Internal Reference (typical dBc/Hz@950-2150):

10 Hz	100Hz	1kHz	10kHz	100khz	1MHz
-60	-78	-103	-110	-112	-133

IF-band:
Connector: BNC (F) - 75 ohms
Return loss: > 20 dB
Level: -40/+10 dBm (± 3 dB)
Frequency: 50 - 180 MHz (10 Hz steps)
Spurious: Better than -65 dBc/4 kHz @ +5dBm
Phase Noise with Internal Reference (typical dBc/Hz@50-140):

10 Hz	100Hz	1kHz	10kHz	100khz	1MHz
-65	-80	-105	-114	-120	-133

L-band monitoring output:
Connector: SMA (F), 50 ohms
Return loss: > 14 dB
Level: -45 dBm
Frequency: identical to L-band output.

10 MHz reference input / output interface:

Input:
Connector: BNC (F) – 50 ohms
Level: -8dbm ÷ +5dBm
Autosensing function

Output (*option, MS2E board required*):
Connector: BNC (F) – 50 ohms
Level: 0 dbm ±1 dB

BUC reference:
Frequency: 10MHz

Internal Reference frequency:
High Stability
Stability: ± 1 ppm over -20°C to 70°C
Ageing: ± 1 ppm/year
Very High Stability (*optional*)
Stability: ± 5 ppb over 0°C to 65°C
Ageing: ± 1 ppb/day
± 500 ppb/10 year

Extension boards:

AB01:
Input: 2 DVB-ASI
Connectors: BNC (F) - 75 ohms
ASI Format: 188 and/or 204 byte mode

MS2E:
Input: 4 DVB-ASI
Connectors: BNC (F) - 75 ohms
ASI Format: 188 and/or 204 byte mode

IP-01:
In/out: 8 x TSoIP on RJ-45
4 x DVB-ASI on BNC(F) - 75 ohms
Ports: 1 x GbE
Connector: RJ-45 10/100/1000-Auto Negotiating
IP Protocol: UDP/RTP
Addressing: Unicast and Multicast
Forward Error Correction

Control:

Front panel (TFT touchscreen display)
Web browser (embedded http server, no additional software required)
SNMP v2

Electrical:

Supply:
AC: 100-240 V~ 50/60 Hz IEC 320
DC: 22 ÷ 65 V (2 pins plug)
10 ÷ 36 V (2 pins plug)

Configuration:
Single AC or DC
Single AC and DC
Dual Redundant Hot swappable AC
Dual Redundant Hot swappable DC
Dual Redundant Hot swappable AC+DC

Power consumption:
Base chassis: 4.5W
MS2 consumption: 30 W

Mechanical:

Chassis: 1U Rack 19”
Dimensions:
Width 482.5 mm
Height 43.65 mm
Depth 357.80 mm
Weight:
Base chassis: 2.5 Kg
Maximum: up to 7 Kg (depending on number and type of slots)

Environmental:

Operative temperature range: -10 ÷ 55°C
Relative Humidity: 0 - 95% non-condensing

** Elber reserves the right to make changes to specifications of products described in this datasheet at any time without notice and without obligation to notify any person of such changes.*

ELBER WIRELESS INSIGHT
ELBER Srl. Via Pontevecchio, 42W - 16042 Carasco (GE) Italy
Phone +39.0185.351333 fax +39.0185.351300
www.elber.com - elber@elber.it