

NTC7044/BB

DVB-S/S2 Demodulator Board

OEM Product

Description

The NTC/7044 board is a state-of-the-art, high-end professional DVB-S2 demodulator board able to process data rates up to 155 Mbit/s and operate in 16APSK and 32APSK high-order modulation schemes. Available to third party manufacturers under OEM agreement, the high performance NTC/7044 is the best solution for the demodulation of DVB-S/S2 carriers in IRDs, IP receivers, and Mobile or Digital Terrestrial TV transceivers.

In its default configuration the demodulator board is capable of demodulating an MPEG2 transport stream in DVB-S, DVB-DSNG and DVB-S2. The Multistream, VCM or ACM modes of DVB-S2 are also supported.

The NTC/7044 has a dual L-band input (950-2150 MHz). The active input is selectable and can provide DC power and frequency band selection signals compatible with most professional and commercial LNBs.

In DVB-S or DVB-DSNG, the demodulator board delivers an MPEG transport stream on a parallel output. In DVB-S2, the demodulator board can output the Base Band Frame signal, a transport stream or a generic stream. If the demodulated carrier is a Multistream signal, the NTC/7044 can filter and output one of the transport or generic streams, and the ISSY (Input Stream Synchroniser) mechanism defined in the DVB-S2 standard can be activated to recover the initial data rate.

To protect the satellite transmission in DVB-S2 mode, the AES decryption option can be activated. AES encryption allows the transmission of DVB-S2 streams with a high security level. The AES encryption mechanism can work in two different modes. In the first global protection mode all different DVB-S2 streams are encrypted with the same content key. The second mode for protection per stream encrypts up to four DVB-S2 streams with a different content key.

To compensate for linear distortion in the transmission channel, the NTC/7044 is equipped with an adaptive equalizer.

The demodulator board can be controlled via an asynchronous serial link with a comprehensive range of monitoring and control functions.

Key features

- DVB-S2 and DVB-DSNG/S compliant
- QPSK, 8PSK, optional: 16APSK and 32APSK
- ISSY (Input Stream Synchronizer) mechanism
- Support of Multistream and/or VCM/ACM operation
- Data rates up to 155 Mbit/s
- Baud rate up to 45 Mbaud
- Optional AES decryption

- Dual L-band input
- Automatic ModCod detection
- Adaptive equalizer
- LNB power and control
- Monitoring and control via RMCP

Main advantages

- Reduce time to market
- Easy integration
- High compactness
- Low cost
- Guaranteed interoperability with DVB modulators
- High versatility and flexibility
- Secure satellite transmissions

Applications

- Contribution
- Primary distribution
- DSNG combined with IP services
- IP trunking
- Data broadcast

Related Documents

White paper and application note on
"The Advantages of DVB-S2 Multistream"



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Specifications – NTC7044/BB

Input interface

Dual L-band input

- Connector 2 x F-type (F), 75 ohms
- Level -25 to (-65 dBm +10log(f)) where f=baud rate in Mbaud
- Frequency 950 - 2150 MHz
- Return loss >9 dB
- adjacent signal < (C0 + 7) dBm/Hz with C0 = signal level density

LNB Power & Control

- Current: max 450 mA (on selected L-band input)
- voltage: 11.5-14 V (vertical polarisation)
16-19 V (horizontal polarisation)
& additional 22 KHz ± 4 kHz (band selection according to universal LNB for ASTRA satellites) & DiSEqC command transmission

Demodulation

Supported modulation schemes and FEC

- DVB-S/DSNG:
 - Outer/Inner FEC: Reed Solomon /Viterbi
 - MODCODs: QPSK: 1/2, 2/3, 3/4, 5/6, 7/8;
 - 8PSK: 2/3, 5/6; 8/9
 - 16QAM: 3/4, 7/8
- DVB-S2:
 - Outer/Inner FEC: BCH/ 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

Min-Max baudrates

- DVB-S2
 - QPSK/8PSK/16APSK 0,256 – 45 Mbaud
 - 32 APSK 1-33 Mbaud
- DVB-S/DSNG
 - QPSK/8PSK/16QAM 1-45Mbaud

Frame length

- DVB-S2 Short Frames 16200 bits
- DVB-S2 Normal Frames 64800 bits
- Mixing of normal frames & short frames not possible in Multistream
- 32APSK: Normal frame only
- DVB-S/DSNG 188 bytes

Roll-off factor

- DVB-S2 20 % - 25 % - 35 %
- DVB-S-DSNG 25% - 35 %

Performance

DVB-S2 : Measured performances
188 bytes PER 1E-5(BER~5E-8)

Config	Short Frames		Normal Frames	
	< 15 Mbaud	< 45 Mbaud	< 15 Mbaud	< 45 Mbaud
	Es/No	Es/No	Es/No	Es/No
QPSK- 1/3	-0.6	-0.7	-	-
QPSK- 2/5	0.4	0.2	-	-
QPSK- 1/2	1	1.4	-	-
QPSK- 3/5	3.1	2.8	-	-
QPSK- 2/3	3.8	3.6	-	-
QPSK- 3/4	4.5	4.3	-	-
QPSK- 4/5	5.1	5.1	-	-
QPSK- 5/6	5.8	5.5	-	-
QPSK- 8/9	6.7	6.6	-	-
QPSK- 9/10	-	6.7	-	-
8PSK- 3/5	6.5	6.3	-	-
8PSK- 2/3	7.4	7.1	-	-
8PSK- 3/4	8.6	8.4	-	-
8PSK- 5/6	10.2	9.7	-	-
8PSK- 8/9	11.4	11.1	-	-
8PSK- 9/10	-	11.3	-	-
16APSK- 2/3	9.9	9.6	-	-
16APSK- 3/4	10.9	10.5	-	-
16APSK- 4/5	11.6	11.5	-	-
16APSK- 5/6	12.4	12.1	-	-
16APSK- 8/9	13.6	13.3	-	-
16APSK- 9/10	-	13.6	-	-
32APSK- 3/4	-	13.6	-	-
32APSK- 4/5	-	14.5	-	-
32APSK- 5/6	-	14.9	-	-
32APSK- 8/9	-	16.1	-	-
32APSK- 9/10	-	16.5	-	-

DVB-DSNG/S : Specification for
BER=1E-7 after RS (188 bytes)

Config	< 20 Mbaud		> 20 Mbaud	
	Es/No	Es/No	Es/No	Es/No
QPSK- 1/2	3.9	3.9	-	-
QPSK- 2/3	4.4	4.5	-	-
QPSK- 3/4	4.9	5.1	-	-
QPSK- 5/6	5.4	5.8	-	-
QPSK- 7/8	5.8	6.4	-	-
8PSK- 2/3	6.3	6.5	-	-
8PSK- 5/6	8.3	8.8	-	-
8PSK- 8/9	8.8	9.8	-	-
16QAM- 3/4	8.4	8.6	-	-
16QAM- 7/8	10.1	11.1	-	-

Output interface

Data output

- Connector HE10 50 pin

Decryption (optional)

- AES 64 bit
 - Global mode All streams
 - Per stream mode Up to four streams

Physical

- Mechanical Single PCB, 160 x 100 mm
- Power supply
 - Main +5V ± 5% at 2.5 A
 - Secondary +10V (0.18 A) to +15V (0.08 A) (no LNB current)
+10V(1.2 A) to 15 V (0.7 A) (450 mA LNB current)
- Temperature
 - Operational: 0°C to 50°C
 - Storage: -40 to +70°C

Generic

Monitor and control interfaces

- On same connector as Data outputs
- I²C
- Async serial TTL link, even parity, 1 start, 1 stop Baudrate 9.600 (default) to 115.2 kbaud, RMCPv2 protocol

Control

- Interface and symbol rate
- Roll-off factor
- Decoding & Demodulation Mode
- Spectrum Inversion On/Off/Auto
- Acquisition range
- LNB band and polarisation selection (13/18 V and 22 kHz)
- IFL input selection (A or B)
- Global reset
- Output selection (single stream or base-band frames)
- AES

Monitoring

- All control parameters
- Input level, carrier & clock frequency offset
- Uncorrectable base-band frames count (DVB-S2)
- Es/No (DVB-S2)
- Channel quality estimates (DVB-S2)
- Eb/No (DVB-S/DSNG)
- Uncorrectable TS packets count (DVB-S/DSNG)
- Estimated BER after decoding (DVB-S/DSNG)
- Sync status, alarms
- Board + firmware version

Ordering information

NTC7044/BB		Order n°
Default configuration		
NTC7044/BB DVB-S/S2 Demodulator Board Modulation & Baud rate DVB-S/DSNG/S2 Q/8PSK 15 Mbaud		NTC7044/BB BOBB
Configuration options		
Category	Max. 1 option per category	
Modulation & Baud rate	DVB-S/ DSNG/S2 Q/8PSK 15 Mbaud	BOBB
	DVB-S/ DSNG/S2 Q/8PSK 30 Mbaud	BOBC
	DVB-S/ DSNG/S2 Q/8PSK 45 Mbaud	BOBD
	DVB-S/DSNG/S2 Q/8PSK, 16QAM,16APSK 15 Mbaud	BOCB
	DVB-S/DSNG/S2 Q/8PSK, 16QAM,16APSK 30 Mbaud	BOCC
	DVB-S/DSNG/S2 Q/8PSK, 16QAM,16APSK 45 Mbaud	BOCD
	DVB-S/DSNG/S2 Q/8PSK, 16QAM,16/32APSK 15 Mbaud	BODB
	DVB-S/DSNG/S2 Q/8PSK, 16QAM,16/32APSK 30 Mbaud	BODC
DVB-S/DSNG/S2 Q/8PSK, 16QAM,16/32APSK 45 Mbaud	BODD	
Additional options		
Category	Max. 1 option per category	
Security	AES 64 bit decryption*	LA-01

(*) upgrade via license key

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