



• DESCRIPTION

As the successor of the NTC/2063 DVB Demodulator, the NTC/2163 demodulator is equally compatible with DVB-S (EN 300421) and DVB-DSNG (EN 301210) as well as with TELCO and IP applications. It is therefore standard equipped with QPSK, 8PSK and 16QAM demodulation schemes.

The dual L-band input ranges from 950 to 2150 MHz and is compatible with commercial LNB's which are suitable for data communication. Optionally, one L-band input can be fitted with a 50-180 MHz block up converter.

It further handles data rates from 1 Mb/s up to 45 Mbaud, covering all SCPC and MCPC applications.

As with all Newtec modulators and demodulators, the data rate can be limited (and upgraded later on via password) to lower rates, thus resulting in a lower initial investment.

Two output slots can be fitted with a range of interface cards. Several DVB (ASI, SPI, LVDS) and TELCO (HSSI, G703, IP) interface cards are available.

All Control and Monitoring parameters are available locally on the front panel (LCD display & keyboard) and remotely through a web interface (HTTP) or through the RS-485/232 port or through the 10/100 Base-T Ethernet port. The last two use the RMCPv2 protocol. An SNMP + MIB agent is optionally available.

Inherent to its modular design, the demodulator can be SW-upgraded to a higher capability (data rate, functionalities, etc.) after ordering the corresponding password, which is simply keyed-in by the customer.

• APPLICATIONS

Medium to high data rate DVB Broadcast receptions for distribution (QPSK) and Contribution (QPSK+8PSK+16QAM) and for DVB-IP satellite backbones.

Also used as demodulator-deconcentrator unit for reception of multiple program re-transmission in DVB-T SFN networks.

- DVB-S compliant (EN 300421) and DVB-DSNG compliant (EN 301210)
- Data interface : See options : serial-LVDS, ASI (coax or optical), SPI, HSSI, G703, De-concentrated ASI, IP
- Specially adapted for unidirectional digital TV transmissions
- 8PSK & 16QAM mode and 25% - 35% roll-off for low sat. cost
- Baud rate : range 1 to 45 Mbaud
- Interface rate : in range 0.92 to 145.20 Mbit/s depending on selected baud rate and modulation
- IFL : 950-2150 MHz
- Optional IF input: 50-180 MHz
- Excellent performance in combination with the Newtec satellite modulators (NTC/2177, 2180, 2277 and 2280 (when working in DVB-DSNG/S mode)
- Local & remote M&C access to all menus through a
 - * web interface (Http protocol)
 - * RS-485/RS-232 (RMCPv2 protocol)
 - * 10/100Base-T Ethernet port (RMCPv2 + SNMP/MIB)
- Support for one SNMP alarm trap
- User programmable menu structure
- Action Keys (group of commands under 1 button)
- Real-time clock for alarm occurrences logging
- Dynamic build-up of alarm menu
- Very compact - 1 RU (height : 4.4cm)
- Highly reliable and modular design
- Low cost
- CE label
- BER - Eb/No pre-alarm

Configuration Help :

The Azimuth series provides a nearly non-exhaustive number of configuration possibilities.

By simply downloading and installing the Newtec web-based "Azimuth Configuration Engine" you can determine your specific equipment according to your selection criteria.

Alternatively, Newtec's sales and support team are at your full disposal for any additional information you might need. (See last page for our coordinates)

• VERSIONS & OPTIONS

The modular Azimuth architecture opens various possibilities and application fields: one of the slots on the back panel will accept a wide range of data interface boards, while firmware-packages will determine the usage and capabilities of the unit. Also, other modules, such as frequency converters and specific ASI process modules can be installed within the unit.

1. Base band Data Interface Output Modules :

The interchangeable Base Band data interface modules provide a wide range of input interfaces via coaxial and/or sub-D connectors. Optical inputs and outputs are also available.

- NTC/3453.BA.Bx: DVB ASI/SPI/Serial-LVDS output interface card
Hardware option: optical ASI in/out plug-in NTC/3453.x.x.A
- NTC/3458.Ax.x: TELCO HSSI+2x single rate G703 interface card
 - * NTC/3458.AB.A: HSSI-G.703 output 2 to 52 Mbps
 - * NTC/3458.AB.B: HSSI-G.703 output 2 to 110 Mbps
 - * NTC/3343/AA: G.703 at 8.448 Mb/s submodule used on NTC/3458
 - * NTC/3343/AB: G.703 at 6.312 Mb/s submodule used on NTC/3458
 - * NTC/3344/AA: G.703 at 16.896 Mb/s submodule used on NTC/3458
 - * NTC/3344/AB: G.703 at 34.368 Mb/s submodule used on NTC/3458
 - * NTC/3348/AA: G.703 at 44.736 Mb/s submodule used on NTC/3458
 - * NTC/3349/AA: G.703 at 2.048 Mb/s submodule used on NTC/3458
- NTC/3454.AD.A: ASI Deconcentrator board with 4 coax outputs
- NTC/7015/xx: IP GbE & ASI in/out interface (under development)

2. NTC/7042 Demodulator Board (Max. Data rate) :

- NTC/7042/ADCA: < 5 Mbaud
- NTC/7042/ADCB: < 15 Mbaud
- NTC/7042/ADCC: < 30 Mbaud
- NTC/7042/ADCD: < 45 Mbaud

3. 10 MHz Reference Board :

One of the following 10 MHz ref. boards is always required whenever an external 10 MHz reference input and/or output is required.

- NTC/3462/AB.A : 10 MHz OCXO reference Oscillator (normal use)
Temperature stability: 0,05 ppm
- NTC/3462/AA.A : 10 MHz OCXO High Stability Ref. Oscillator
(recommended only with carriers < 1MHz)
Temperature stability: 0,002 ppm)

4. SNMP agent and MIB library

Needed whenever the unit needs to be controlled over Ethernet via proprietary NMS.

NTC/2163.xx.xB

5. NTC/3495 IF input board

Optional L-band to IF converter: NTC/3495.AA.A

• DATA SUMMARY

IFL INPUT : dual input, selectable

- frequency range : 950-2150 MHz
- return loss : > 7 dB (75 Ohm-F(F))

- signal level : -25 to -65 dBm
- adjacent signal : < ($C_0 + 7$) dBm/Hz with C_0 = signal level density

IF INPUT (optional):

- frequency range : 50-180 MHz (replacing one L-band input)
- return loss : > 15 dB (75 Ohm) BNC(F)
- signal level : -15 to -55 dBm
- adjacent signal : < ($C_0 + 7$) dBm/Hz with C_0 = signal level density

DATA OUTPUTS :

- ASI (Asynchronous Serial Interface) :
 - BNC (F) - 75 Ohm (coax) or ST (optical)
 - rate limited by demod
 - 188 byte mode
- SPI interface
 - 25 pin sub-D connector
 - rate limited by demod
 - 188 byte mode
 - see data sheet NTC/3453
- HSSI (High Speed Serial Interface) :
 - 25 pin sub-D (F)
- G703 : BNC (F)
- ASI Deconcentrator: 4x BNC (F)
- IP GbE & ASI in/out interface (ASI under development): 2 x RJ-45

MONITOR & CONTROL INTERFACES :

- a) protocol : HTTP (via web browser)
- connector : RJ-45
- electrical : Ethernet 10 base-T
- b) protocol : RMCP **version 2 only**
- connector : 9 pin sub-D female
- electrical : RS-485 / RS-232
- c) protocol : RMCP **version 2 only** over TCP-IP or UDP, SNMP
- connector : RJ-45
- electrical : Ethernet 10 base-T

ALARM INTERFACE :

- connector: 9 pin sub-D (F)
- electrical: switch-over contact

MECHANICAL :

- 19" sub rack, 1 RU height (4.4 cm), 6 kg

POWER SUPPLY :

- 90-130/180-260V, 60 VA

LNB POWER AND CONTROL :

- max. current: 350 mA (on selected IFL input)
- voltage: 11.5-14 V (vertical polarization) 16-19 V (horizontal polarization) & additional 22 KHz $\pm$ 4 kHz (band selection according to universal LNB for ASTRA satellites & DiSEqC command transmission)

TEMPERATURE :

- operational: 0°/+40°C
- storage : -40°/+70°C

CONTROL:

Interface rate (1 bit/s resol.) and symbol rate (1 baud resol.), FEC-rate and demodulation, IFL and LO frequency (95 Hz resol.), 10.0 MHz source (internal or external), internal PRBS decoder on/off, pre-alarm BER threshold, interface type, interface equalizer, Data framing (MPEG TS internal/external), output selection, spectrum inversion on/off, serial interface hardware and address, user levels, screensaver, etc.

MONITORING:

All control parameters, Internal temp. Input level, carrier & clock frequency offset. Channel BER, decoder BER, Eb/No Sync status, buffer status, alarms, Pre-alarm on preset BER threshold PRBS detector.

• PERFORMANCE
USER RATES:

sat. baud rate : 1 to 45 Mbaud
 interf. rate limit (QPSK FEC1/2) : 0.917 Mb/s (min)
 (16QAM FEC 7/8) : 145.147 Mb/s (max)
 interf. rate/sat. baud rate : 2 x FEC x 188/204 for QPSK
 : 3 x FEC x 188/204 for 8PSK
 : 4 x FEC x 188/204 for 16QAM

BER PERFORMANCE for BER 1E-7 after RS

CONFIG	Eb (188 byte)/No (dB)		
	EN 301 210 specifications before RS	after RS @ BER < 1E-7	
	@ BER = 2E-4	Mbaud <20	Mbaud >20
QPSK-1/2	4.5	3.9	3.9
QPSK-2/3	5.0	4.4	4.5
QPSK-3/4	5.5	4.9	5.1
QPSK-5/6	6.0	5.4	5.8
QPSK-7/8	6.4	5.8	6.4
8PSK-2/3	6.9	6.3	6.5
8PSK-5/6	8.9	8.3	8.8
8PSK-8/9	9.4	8.8	9.8
16QAM-3/4	9.0	8.4	8.6
16QAM-7/8	10.7	10.1	11.1

SYNCHRONISATION:

carrier acquisition range : ± 3 MHz max.
 clock acquisition range : ± 200 ppm max.
 average acquisition time : < 3 sec, 90% probability at carrier freq. offset < ± 2.5 MHz ptp and PER < 1E-7

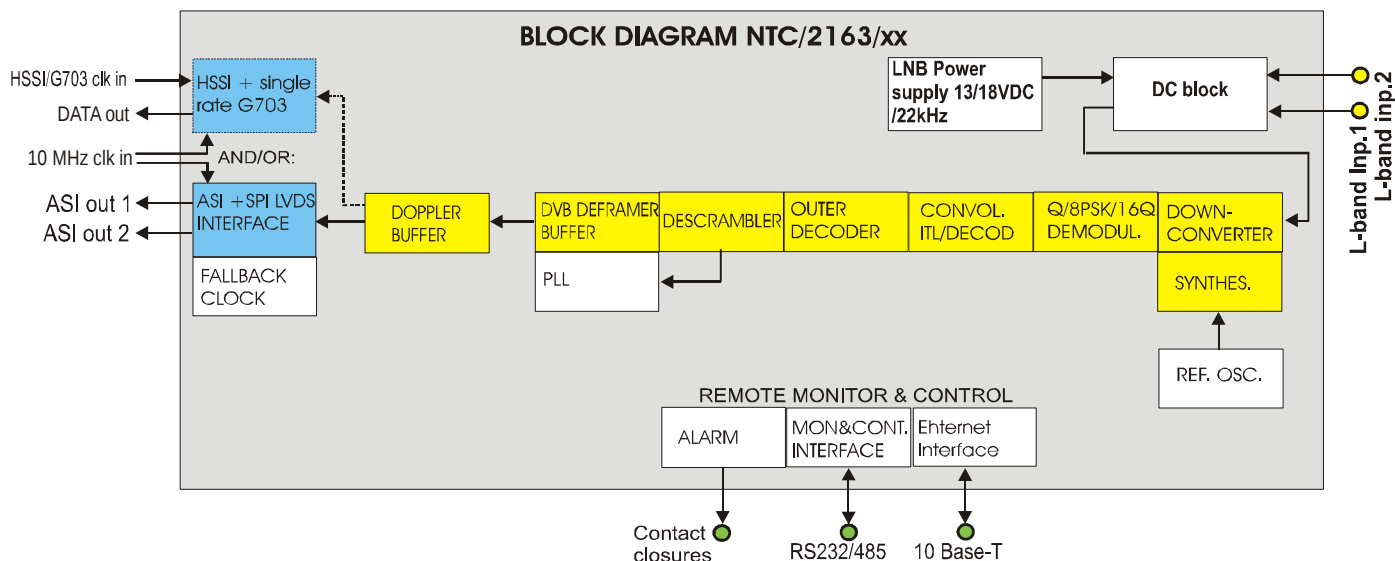
LNB PHASE NOISE REQUIREMENT:

Type A (PL-DRO)
 <-65dBc/Hz at 1kHz
 <-75dBc/Hz at 10kHz
 <-85dBc/Hz at 100kHz
 Low symbol rates (<5Msymbol) require a PLL LNB
 Type B (free running DRO):
 <-50dBc/Hz at 1kHz
 <-75dBc/Hz at 10kHz
 <-85dBc/Hz at 100kHz

TYPICAL RF PARAMETER (LNB) REQUIREMENTS :

equiv. inp. Temp. : 100K (typ.)
 equiv. inp. noise : -178 dBm/Hz
 LNB gain : 55 to 70 dB
 Phase noise SSB
 Type A: all rates
 Type B: for QPSK > 5Mbaud
 for 8APSK > 22Mbaud
 for 16QAM > 6Mbaud
 LNB supply : 13/18 V/ 0.35 A
 cable loss (100m) : < 20 dB

- **BLOCK DIAGRAM**



• **TECHNICAL LITERATURE & REFERENCES (ALSO AVAILABLE ON OUR WEBSITE)**

Other related products

NTC/2137/Ax	Stand-alone ASI 4/8:1 Concentrator & 4/8:1 Deconcentrator
NTC/2088/xx	Active L-band splitter & switching matrix
NTC/3750/Ax	L-band conditioner & active splitter module
NTC/7042/AA	Universal DVB-Contribution TV Demodulator Board (1-45 Mbaud)
NTC/3453	DVB ASI/SPI/Serial-LVDS interface board
NTC/3454/AD	4-output ASI TS Deconcentrator
NTC/3458	TELCO HSSI + Single rate G703 w. external Data Clock input interface board
NTC/7015/xx	GbE + ASI interface board

Application notes

NTC/2063/APN01	BER Measurement method for QPSK/8PSK/16QAM
NTC/2063/APN02	BER performance DVB+8+16 Demodulator
NTC/2063/APN03	Distinguishing between PCR accuracy and PCR jitter
NTC/2063/APN04	Determining the maximum data rates in (de)modulators
NTC/2080/APN03	Choice of QPSK, 8PSK or 16QAM in DVB satellite links
NTC/2080/APN04	Data broadcast concepts possible with DVB modem equipment

Technical publications

Newtec News August 2001	Newtec Universal IRD
Newtec News February 2001	NTC/2063/xx demod. Gets auto buffer reset
Newtec News December 2000	DVB Demod NTC/2063 now has BER pre-alarm feature
March 2001	Fractional OC-3 ATM over a DVB/ASI satellite system
February 1997	New trends in DVB-S Technology
Newtec News April '97	A Digital SNG Demonstrator system
December 1996	Performance considerations of multiphase and multilevel digital modulation techniques

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