

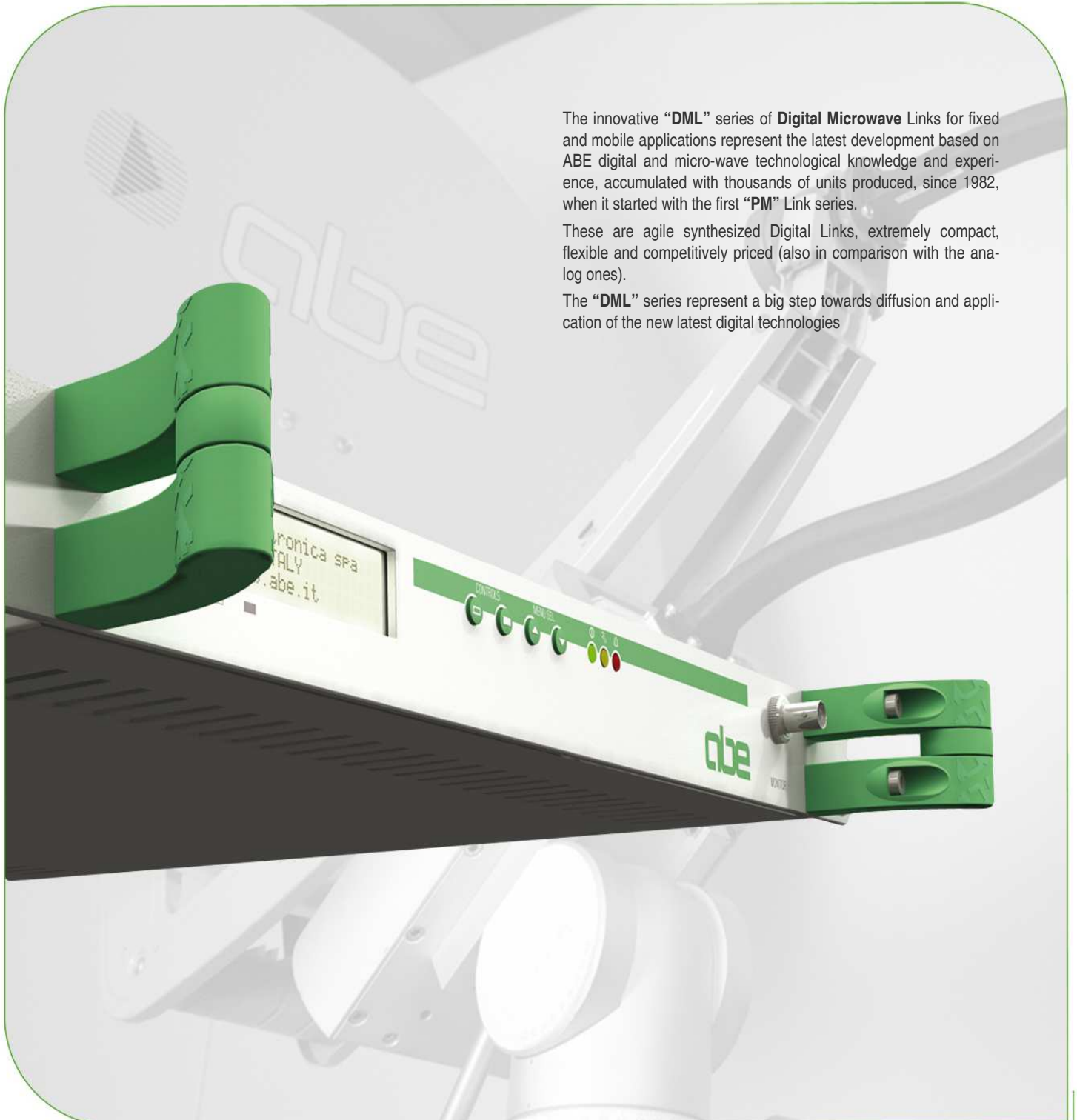
DIGITAL TV MICROWAVE LINKS – STL (FIXED) & MOBILE QPSK – PSK – OFDM MODULATIONS

The high quality, professional and cost-effective solution

The innovative “DML” series of **Digital Microwave** Links for fixed and mobile applications represent the latest development based on ABE digital and micro-wave technological knowledge and experience, accumulated with thousands of units produced, since 1982, when it started with the first “PM” Link series.

These are agile synthesized Digital Links, extremely compact, flexible and competitively priced (also in comparison with the analog ones).

The “DML” series represent a big step towards diffusion and application of the new latest digital technologies





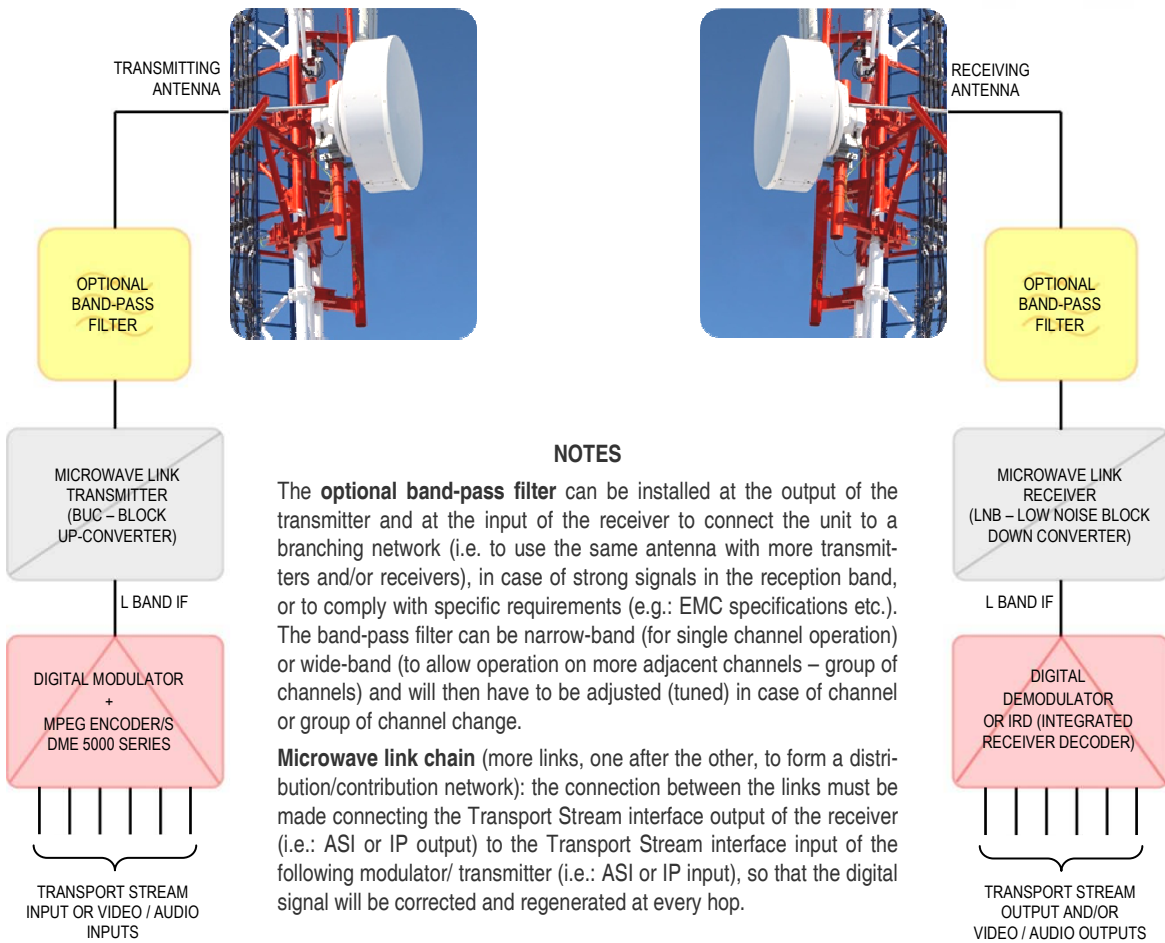
MAIN FEATURES:

- ASI or Ethernet (Video Over IP) input/output interfaces with bit rate up to 100Mbit/s
- Modulation schemes supported: DVB-S/S2 or OFDM (DVB standard)
- Capable to support, under some circumstances, NLOS (Non Line Of Sight) condition (OFDM modulation scheme)
- Capable to carry up to #6 different MPEG Transport Streams (DVB-S2 multistream mode)
- Optional digital or analog video/audio inputs and outputs
- Versions with up to four video/dual audio high performance HD/SD MPEG encoders and decoders
- Fully agile in the entire frequency band
- Standard or offset parabolic antennas
- Tripod mounted versions

APPLICATIONS:

- Fixed links (STL – Studio Transmitter Link)
- Mobile links (e.g.: for O.B. Van)
- Distribution/Contribution terrestrial Microwave Link Networks

Tripod mounted ODU (OutDoor Unit) for mobile operation



NOTES

The **optional band-pass filter** can be installed at the output of the transmitter and at the input of the receiver to connect the unit to a branching network (i.e. to use the same antenna with more transmitters and/or receivers), in case of strong signals in the reception band, or to comply with specific requirements (e.g.: EMC specifications etc.). The band-pass filter can be narrow-band (for single channel operation) or wide-band (to allow operation on more adjacent channels – group of channels) and will then have to be adjusted (tuned) in case of channel or group of channel change.

Microwave link chain (more links, one after the other, to form a distribution/contribution network): the connection between the links must be made connecting the Transport Stream interface output of the receiver (i.e.: ASI or IP output) to the Transport Stream interface input of the following modulator/ transmitter (i.e.: ASI or IP input), so that the digital signal will be corrected and regenerated at every hop.

GENERAL SPECIFICATIONS

Frequency range:	DML 2: 2.15 to 2.7GHz DML 7: 5.7 to 6.54GHz; 6.54 to 7.5GHz; 7.5 to 8.6GHz (N°3 Sub-bands) DML10: 10.1 to 10.9GHz DML13: 12.7 to 13.75GHz DML14: 14.0 to 14.5GHz
Other models for different frequency range:	Please contact ABE's sales office
IF frequency:	"L" Band (950 to 2150MHz)
Modulation type and information capacity:	QPSK (DVB-S EN 300 421) up to 33.4Mbit/s in 28MHz bandwidth up to 23.8Mbit/s in 20MHz bandwidth 8PSK (DVB-S2 EN 302 307) up to 61Mbit/s in 28MHz bandwidth up to 43.5Mbit/s in 20MHz bandwidth 16APSK (DVB-S2 EN 302 307) up to 81Mbit/s in 28MHz bandwidth 32APSK (DVB-S2 EN 302 307) up to 101Mbit/s in 28MHz bandwidth OFDM (DVB standard) up to 31.1Mbit/s in 8MHz bandwidth
Operating temperature range:	-5° to +45°C (for indoor units) -30° to +50°C (for outdoor units)
Operating relative humidity range:	up to 95% - Non condensing
Power supply:	230Vac ±10% 50-60Hz (Option: other AC or DC voltages and tolerances on request)
Housing:	Standard Rack drawer 19" 1U for indoor units (IDU); Outdoor sealed box for external units (ODU)
IF ("L" Band) DIGITAL MODULATOR – MPEG ENCODERS – INDOOR UNITS	
See specific documentation (brochure) DME 5000 Series	"L" Band digital modulator with Transport Stream input or 1 to 4 MPEG-2 and/or MPEG-4 (H.264 HD/SD) encoders
TRANSMISSION CONVERTER (BUC Block Up-Converter) – OUTDOOR UNIT	
IF ("L" Band) input impedance / connector:	50Ω / "N" female
Output power (@ gain compression):	1W (+30dBm – tol. ±1.5dB) or 2W (+33dBm – tol. ±1.5dB) according to the model Option: higher power amplifiers
Typical output power backoff according to modulation scheme:	QPSK: -3dB 8PSK: -4dB 16APSK: -6dB 32APSK: -8dB OFDM: -10dB
Frequency stability:	≥ 2.5 x 10 ⁻⁶ (2.5ppm)
Output impedance and connector:	50Ω / "N" female or waveguide, according to frequency range
Power supply:	18 to 24V DC through IF cable
Available versions:	Simplified: only up-converter with power amplifier Standard: complete with 10MHz reference, AGC, telemetry, predisposition for output filter
RECEPTION CONVERTER (LNB - Low Noise Block Down-Converter) – OUTDOOR UNIT	
Input impedance and connector:	50Ω / "N" female or waveguide, according to frequency range
IF ("L" Band) output impedance / connector:	50Ω / N female
Gain:	30 to 35dB (max. typical gain)
Noise figure:	1.2dB (typical)
Power supply:	12 to 18V DC through IF cable
Available versions:	Simplified: only low noise down-converter Standard: hi performance, adjustable gain, predisposition for input filter

IF ("L" BAND or UHF) DEMODULATORS (Receivers and IRDs - Integrated Receiver Decoder) – INDOOR UNITS

See specific documentation (brochures)

IRD 1001/AW:	DVB-S "L" Band digital IRD with MPEG-2 decoder
IRD 5001/AW:	DVB-S/S2 "L" Band digital IRD with MPEG-2 and MPEG-4 H.264 HD/SD decoder
RXS 1000 (DVB-S/S2 version):	DVB-S/S2 "L" Band digital multistream receiver (Transport Stream output)
RXS 1000 (OFDM version):	OFDM (DVB standard) 2K/8K receiver (Transport Stream output)
Other receiver solutions:	DVB-S/S2 "L" Band digital receiver integrated inside TV Transmitters

LINK PERFORMANCES

Occupied bandwidth (channel):	According to symbol rate and roll-off factor settings (up to 40MHz)
Transport stream bit-rate (Link capacity):	According to modulation scheme, code rate, symbol rate, etc. (up to 100Mbit/s)
Receiver minimum input signal:	According to modulation scheme, code rate and symbol rate (up to less than -90dBm)
Example 1:	With 14.8MS/s, 35% roll-off, 7/8 code rate, DVB-S QPSK modulation scheme, the net input bit-rate (Transport Stream bit-rate / Link information capacity) is 23.9Mbit/s, enough to accommodate four Video/Dual-Audio programs with excellent broadcast quality, in the same occupied bandwidth (around 20MHz) of an analog TV microwave link and with a receiver threshold of around -90dBm.
Example 2:	With 16MS/s, 25% roll-off, 3/4 code rate, DVB-S2 8PSK modulation scheme, the net input bit-rate (Transport Stream bit-rate / Link information capacity) is up to 34.8Mbit/s in the same occupied bandwidth (around 20MHz) of an analog TV microwave link and with a receiver threshold of around -90dBm.
Example 3:	With 23.3MS/s, 20% roll-off, 9/10 code rate, DVB-S2 32APSK modulation scheme, the net input bit-rate (Transport Stream bit-rate / Link information capacity) is up to 101.5Mbit/s in an occupied bandwidth of a standard Link (28MHz) with a receiver threshold of around -80dBm.

7GHz LNB
(Low Noise Block Down Converter)



10GHz BUC (Block Up Converter)

AVAILABLE MAIN OPTIONS:

- Input and output filters for LNBs and BUCs
- Branching networks
- Standard or simplified versions for LNBs and BUCs
- Parabolic antennas for fixed and mobile applications

