

The IRTE digital microwave link STL-N0411 is designed to transport digital flows of Base Band (BB) from different sources.

The basic standard configuration has one integrated LIU (Line Interface Unit) which allows a total capacity of four interfaces, video + audio integrated ASI (188 or 204 bytes) plus two Gigabit Ethernet flows with capacity allocation assigned by the user and max 191 Mbit/s net.



Optionally a second external LIU can be added, or a configuration (1+1) with Dual LIU can be chosen which allows a total capacity of eight interfaces, video + audio integrated ASI (188 or 204 bytes) plus four Gigabit Ethernet flows with capacity allocation assigned by the user and for a total overall capacity of 368 Mbit/s. The overall capacity between the two types of services (ASI and Ethernet), is software configurable between the various ports, together with their level of priority.

**The transmission takes place by modulating a RF carrier according to schemes of M-QAM programmable type by the user, 4QAM, 16QAM, 32QAM, 64QAM, 128QAM, 256QAM, 512QAM or 1024QAM**

Each equipment can be configured into (1+0) or in (1+1) or in (2+0) either mono-directional or bi-directional with hitless or seamless protection.

Unique in its category, with the Hitless Protection Switch can be managed links in (1+1) with path diversity, allowing greater assurance in case of paths with multipath or selective fading (as in the case of crossing sea or with touch of trees or forest).

All configurations can be indoor ("Full Indoor") or semi-fixed ("Split Mount" or IDU-ODU)

This Microwave which dispose of Transmitter with the standard Nominal Power, can be equipped also with the Booster (High Power Amplifier) which allows the design of critical path.

This Microwave furthermore dispose of two supply sections completely separated, which can be supplied with either 230 Vac power supply and / or 48 Vdc. In case of failure of the active section, the other intervenes without causing interruptions of service.

The equipment has a control and management system with an architecture of various microprocessors connected to the functional units of the system through dedicated serial bus.

The control and monitoring system check the status of the terminal, allows the programming of the operating frequencies, of the modulation schemes, of the output power, of the priority of the power supply modules, of the exchange of RF transmission (for the protected 1+1 hot-standby systems), and communicates with the outside world through:

- Display and keypad on the front panel
- LED indicators on the front panel
- One RS485 serial port on the rear panel
- Four Ethernet 10/100 base T ports connected to an internal switch, for the transport of NMS data to / from the opposite radio terminal
- Two programmable relays ("Alarm" and "Warning")
- Four inputs for auxiliary indicators, whose state can be monitored only by the NMS.

The Remote Management is via Ethernet / IP of SNMP type with browser interface.



## STL-N0411 INDOOR MICROWAVE RADIOLINK TECHNICAL GENERAL SPECIFICATIONS (“FULL INDOOR”)

### Frequency Bands:

- ▶ Available: 6L, 6U and 10 GHz
- ▶ Under request: from 2 to 23 GHz

### Basic standard Capacity:

- ▶ 4 x ASI + 2 GbE net (max 191 Mbit/s)

### OPTIONS:

- ▶ 8 x ASI + 4 GbE net (max 368 Mbit/s) adding the second external LIU or adopting the configuration (1+1) with Dual LIU

### Modulation schemes:

From 4QAM to 1024QAM.

### Error Correction:

Programmable convolutional code from 1/2 to 9/10 + Reed Solomon 188/204

### Configurations:

- 1+0 single LIU
- 1+0 dual LIU
- 1+1 single LIU
- 1+1 single LIU with RF switch Tx Hot-Standby
- 1+1 dual LIU
- 1+1 dual LIU with RF switch Tx Hot-Standby
- 1+1 dual LIU with ASI RX Seamless switch
- 1+1 dual LIU with RF switch Tx Hot-Standby and ASI RX Seamless switch
- 2+0 dual LIU
- 2+1 dual LIU with ASI RX Seamless switch
- 2 X 1+0 dual LIU with ASI RX Seamless switch



### Environmental standards:

- Environmental standard reference: ETSI EN 300 019-1-3 class 3.2
- Storage: ETSI EN 300 019-1-1 class 1.2
- Transport: ETSI EN 300 019-1-2 class 2.3

### Environment climate conditions:

- Operating temperature: -10 ° C to +45 ° C
- Storage Temperature: -40 ° C to +80 ° C
- Humidity: 95% (non-condensing) @ +45 ° C
- Height: 4500 m above sea level

### Mechanical Dimensions:

- All terminals STL0411 are contained in sub-racks of 19 “inches tall 1 DIN unit, with the following measures:
- Width: 482.6 mm
  - Depth: 453 mm (excluding handles 40 mm)
  - Height H: 44.4 mm (1 unit)

### Weights:

- Transmitter standard: 9 Kg
- Receiver standard: 9 Kg
- Transceiver standard: 11 Kg
- Auxiliary Sub-rack for LIU-Line Interface Unit: 9 Kg
- Sub-rack for MPEG2 Encoder: 9 Kg

### Consumption:

- (with RF power and fans full working)
- Standard Transmitter: 57W
  - Transmitter with HPA: 115W
  - Standard Receiver: 38W
  - Standard Transceiver: 65W
  - Transceiver with HPA: 125W
  - Auxiliary Sub-rack for LIU: 18W
  - Sub-rack for MPEG2 Encoder: 20W



The connection from indoor sub-rack and outdoor antenna is via suitable wave guide.

# STL-N0411

# DIGITAL RADIO LINK

## STL-N0411 INDOOR TRANSCEIVER SPECIFICATIONS

SYSTEM						
Band		6L BAND	6U BAND	10 BAND		
Frequency Range		5925-6425GHz	6425-7125GHz	10000 – 10680GHz		
ITU Standards		CEPT / ERC / REC 14-01	CEPT / ERC / REC 14-02	ITU-R REC F.747 E CEPT / ERC / REC 12-05		
Bandwidth		28 MHz	40 MHz	28 MHz		
INTERFACE						
W/G INTERFACE	FLANGE	UDR70	UDR70	UDR100		
OUTPUT POWER with High Power Amplifier (dBm) -NOMINAL AFTER FILTER-						
	Modulation					
	4QAM		37	37		36
	16QAM		34	34		33
	32QAM		34	34		33
	64QAM		33	33		32
	128QAM		32	32		31
	256QAM		31	31		30
	512QAM		30	30		29
OUTPUT STANDARD POWER (dBm) -NOMINAL AFTER FILTER-						
	Modulation					
	4QAM		28	28		27
	16QAM		25	25		24
	32QAM		25	25		24
	64QAM		24	24		23
	128QAM		23	23		22
	256QAM		22	22		21
	512QAM		21	21		20
Rx GUARANTEED THRESHOLDS (dBm) BER <math>\leq 2 \times 10^{-4}</math> BEFORE FEC E <math>< 10^{-10}</math> AFTER FEC -QUASI ERROR FREE-						
Nominal Capacity (Mbit/s)	Band (MHz)	Modulation	Convolutional Code			
2	1,75	4QAM	3/4	-101.0	-101.0	-100.0
2x2	3,5	4QAM	3/4	-98.0	-98.0	-97.0
8	7	4QAM	3/4	-95.0	-95.0	-94.0
8	11,6	4QAM	1/2	-96.0	-96.0	-95.0
2x8	14	4QAM	4/5	-92.0	-92.0	-91.0
34	28	4QAM	4/5	-89.0	-89.0	-88.0
STM0	28	16QAM	1/2	-84.0	-84.0	-83.0
2X2	1,75	16QAM	2/3	-95.0	-95.0	-94.0
8	3,5	16QAM	1/2	-92.0	-92.0	-91.0
2X8	7	16QAM	2/3	-89.0	-89.0	-88.0
2X8	11,6	4QAM	10/10	-88.0	-88.0	-87.0
34	14	16QAM	2/3	-86.0	-86.0	-85.0
STM0	20	16QAM	2/3	-84.0	-84.0	-83.0
STM0	14	32QAM	4/5	-81.0	-81.0	-80.0
2XSTM0	28	32QAM	4/5	-78.0	-78.0	-77.0
2X34	28	16QAM	2/3	-82.5	-82.5	-81.5
34	7	128QAM	2/3	-79.0	-79.0	-78.0
2X34	14	128QAM	2/3	-76.0	-76.0	-75.0
STM1	28	256QAM	1/2	-69.5	-69.5	-68.5
4XSTM0	29	512QAM	9/10	-63.0	-63.0	-62.0
4XSTM0	30	512QAM	3/4	-65.0	-65.0	-64.0
4XSTM0	56	32QAM	7/8	-73.5	-73.5	-72.5
45	28	4QAM	10/10	-83.5	-83.5	-82.5
45	14	32QAM	1/2	-82.5	-82.5	-81.5
45	7	512QAM	1/2	-70.0	-70.0	-69.0

All specifications are typical values unless otherwise stated, and are subject to change without notice

## STL-N0411 OUTDOOR MICROWAVE RADIOLINK TECHNICAL GENERAL SPECIFICATIONS (“SPLIT-MOUNT”)

### Frequency Bands:

- Available: 6L, 6U and 10 GHz
- Under request: from 2 to 23 GHz

### Basic standard Capacity:

- 4 x ASI + 2 GbE net (max 191 Mbit/s)

### OPTIONS:

- 8 x ASI + 4 GbE net (max 368 Mbit/s) adding the second external LIU or adopting the configuration (1+1) with Dual LIU

### Modulation schemes:

- From 4QAM to 512QAM.

### Error Correction:

- Programmable convolutional code from 1/2 to 9/10 + Reed Solomon 188/204

### Configurations:

- 1+0 single LIU
- 1+0 dual LIU
- 1+1 single LIU
- 1+1 single LIU with RF switch Tx Hot-Standby
- 1+1 dual LIU
- 1+1 dual LIU with RF switch Tx Hot-Standby
- 1+1 dual LIU with ASI RX Seamless switch
- 1+1 dual LIU with RF switch Tx Hot-Standby and ASI RX Seamless switch
- -2+0 dual LIU
- -2+1 dual LIU with ASI RX Seamless switch
- -2 X 1+0 dual LIU with ASI RX Seamless switch



### Environmental standards:

- Environmental standard reference: ETSI EN 300 019-1-4 class 4.1
- Storage: ETSI EN 300 019-1-1 class 1.2
- Transport: ETSI EN 300 019-1-2 class 2.3

### Environment climate conditions:

- Operating temperature: Indoor -10°C to +45°C - Outdoor -33°C to +55°C
- Storage Temperature: -40°C to +80°C
- Humidity: 95% (non-condensing) @ +45 ° C
- Height: 4500 m above sea level

### Mechanical Dimensions:

All Indoor Base Band terminals (IDU) STL0411 are contained in sub-racks of 19 “inches tall 1 DIN unit, with the following measures:

Width: 482.6 mm; Depth: 453 mm (excluding handles 40 mm);  
Height: 44.4 mm (1 unit)

The waterproof RF Head for OUTDOOR (ODU) has the following dimensions: (excluding pole mount fixing or tripod fixing):

Width: 17 mm ; Depth: 38 mm ;  
Height: 18.50 mm



### Weights:

- IDU: 11 kg MAX
- ODU: 12 kg MAX

### Consumption:

(with RF power and fans full working)

- Standard Transmitter: 90W
- Transmitter with HPA: 145W
- Standard Receiver: 62W
- Standard Transceiver: 97W
- Transceiver with HPA: 155W
- Auxiliary Sub-rack for LIU: 15W
- Sub-rack for MPEG2 Encoder: 20W

### Connection ODU-IDU:

The IDU-ODU connection (IF Tx – Rx; Power Supply; Telecontrol) is carried out via a coaxial cable with double braid screen and terminated with N connectors of a length max 300 m long. Cable impedance could be of 50 ohm (standard RG214) or, on demand, of 75 ohm (RG216).

## STL0411 OUTDOOR TRANSCEIVER SPECIFICATIONS

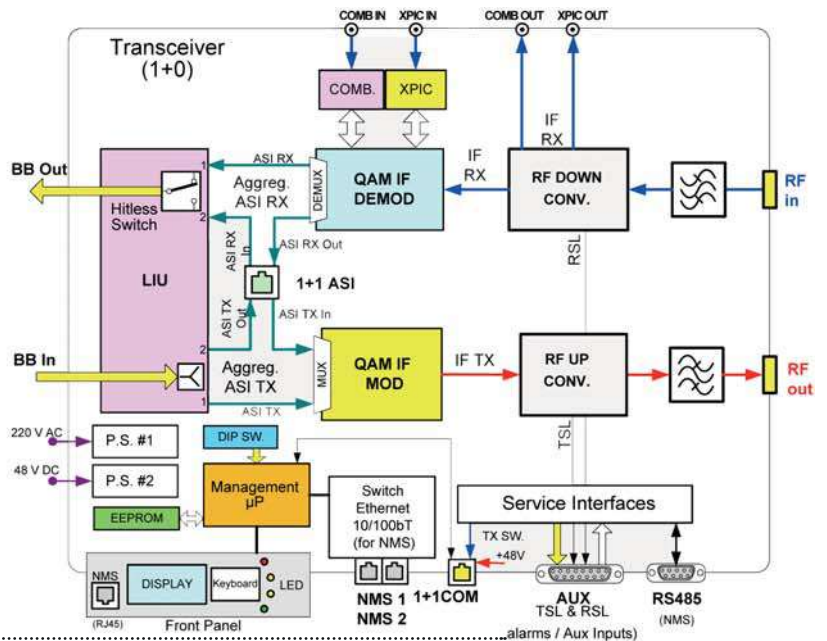
SYSTEM						
Band		6L BAND	6U BAND	10 BAND		
Frequency Range		5925-6425GHz	6425-7125GHz	10000 – 10680GHz		
ITU Standards		CEPT / ERC / REC 14-01	CEPT / ERC / REC 14-02	ITU-R REC F.747 E CEPT / ERC / REC 12-05		
Bandwidth		28 MHz	40 MHz	28 MHz		
INTERFACE						
W/G INTERFACE	FLANGE	UDT70-6 fori	UDT70-6 fori	UBR120		
OUTPUT POWER with High Power Amplifier (dBm) -NOMINAL AFTER FILTER-						
	Modulation					
	4QAM		31	31		31
	16QAM		28	28		27
	32QAM		28	28		27
	64QAM		27	27		26
	128QAM		26	26		25
	256QAM		25	25		24
	512QAM		23	23		22
OUTPUT STANDARD POWER (dBm) -NOMINAL AFTER FILTER-						
	Modulation					
	4QAM		28	28		27
	16QAM		25	25		25
	32QAM		25	25		24
	64QAM		24	24		24
	128QAM		23	23		22
	256QAM		22	22		21
	512QAM		21	21		20
Rx GUARANTEED THRESHOLDS (dBm) BER <math>\leq 2 \times 10^{-4}</math> BEFORE FEC E <math>\leq 10^{-10}</math> AFTER FEC -QUASI ERROR FREE-						
Nominal Capacity (Mbit/s)	Band (MHz)	Modulation	Convolutional Code			
2	1,75	4QAM	3/4	-101.0	-101.0	-100.0
2x2	3,5	4QAM	3/4	-98.0	-98.0	-97.0
8	7	4QAM	3/4	-95.0	-95.0	-94.0
8	11,6	4QAM	1/2	-96.0	-96.0	-95.0
2x8	14	4QAM	4/5	-92.0	-92.0	-91.0
34	28	4QAM	4/5	-89.0	-89.0	-88.0
STM0	28	16QAM	1/2	-84.0	-84.0	-83.0
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8	3,5	16QAM	1/2	-92.0	-92.0	-91.0
2X8	7	16QAM	2/3	-89.0	-89.0	-88.0
2X8	11,6	4QAM	10/10	-88.0	-88.0	-87.0
34	14	16QAM	2/3	-86.0	-86.0	-85.0
STM0	20	16QAM	2/3	-84.0	-84.0	-83.0
STM0	14	32QAM	4/5	-81.0	-81.0	-80.0
2XSTM0	28	32QAM	4/5	-78.0	-78.0	-77.0
2X34	28	16QAM	2/3	-82.5	-82.5	-81.5
34	7	128QAM	2/3	-79.0	-79.0	-78.0
2X34	14	128QAM	2/3	-76.0	-76.0	-75.0
STM1	28	256QAM	1/2	-69.5	-69.5	-68.5
4XSTM0	29	512QAM	9/10	-63.0	-63.0	-62.0
4XSTM0	30	512QAM	3/4	-65.0	-65.0	-64.0
4XSTM0	56	32QAM	7/8	-73.5	-73.5	-72.5
45	28	4QAM	10/10	-83.5	-83.5	-82.5
45	14	32QAM	1/2	-82.5	-82.5	-81.5
45	7	512QAM	1/2	-70.0	-70.0	-69.0

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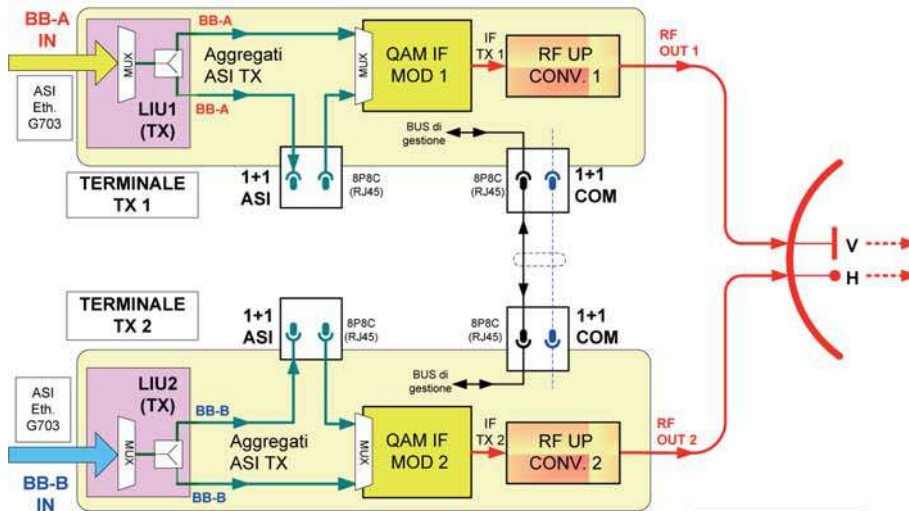
## STL-N0411 BLOCK DIAGRAMS

### BASIC STRUCTURE

#### Transceiver (1+0)

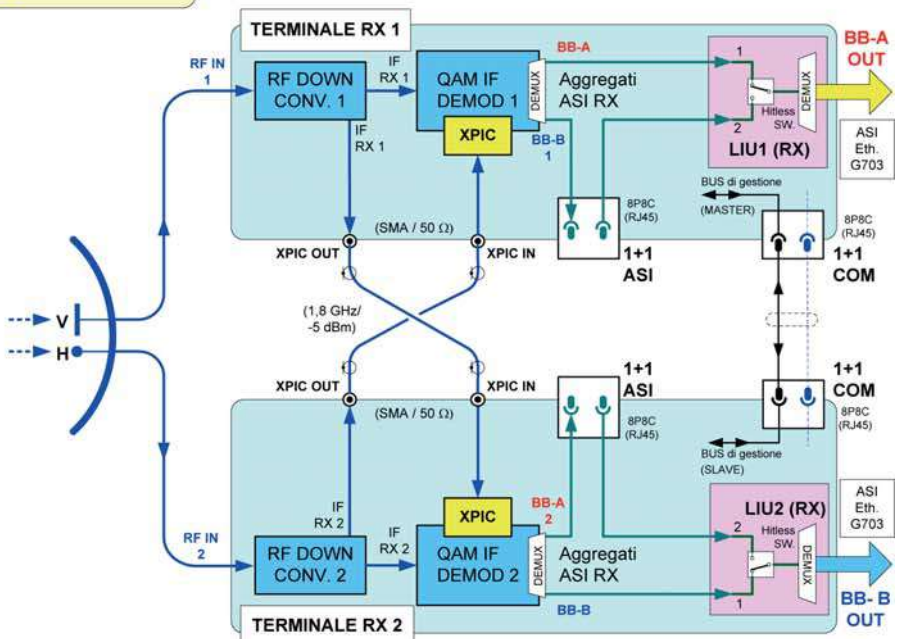


### XPIC Configurations



**Transmitter (2+0)  
Isofrequency with  
cross polarisation**

**IF connections for the XPIC  
function in 2+0 Receivers  
with isofrequency in cross  
polarization of antenna**



data on these datasheet are subject to modifications without previous notice