

PLICSMOBILE T81  
 FCC: O6QPMT8X  
 IC: 3892A-PMT8X

## Company

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## Manufacturing Locations

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## Device

### PLICSMOBILE T81

External radio communication unit for level sensors and point level detection sensors

## HVIN

PMT81R (for plastic housing)  
 PMT81D (for aluminum housing)  
 PMT81W (for stainless steel housing)

## PMN

PLICSMOBILE T81

## Electronics

PMT81-H/PMT81-EXH  
 Containing mainboard: PMT81HFG or PMT81EXHFG  
 Containing antenna feed through board: PMT81-ANT

## FCC ID

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## IC ID

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## 1. General

The PLICSMOBILE T81 will be deployed for collecting measurement values from different sensors and sending them via the mobile communications network to the customer. A plurality of sensors can be connected to the PLICSMOBILE T81 which collects the measured sensor values via HART<sup>1</sup>. The measurement values can be sent by e-mail, SMS<sup>2</sup> or directly to the VEGA Inventory System. In order to adjust and parameterize the PLICSMOBILE T81, the customer has the opportunity to use the integrated Bluetooth interface. The device has also the possibility to determine its position by means of an integrated GNSS<sup>3</sup> receiver. The Tx/Rx paths of all three wireless systems (GSM/UMTS, Bluetooth and GNSS) are combined into one single multiband antenna.

<sup>1</sup> HART - Highway Addressable Remote Transducer Protocol

<sup>2</sup> SMS – Short Message Service

<sup>3</sup> GNSS – Global Navigation Satellite System

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## 2. Instrument Variation

The PLICSMOBILE T81 is available in two versions. An explosion-proof version is designed for hazardous environments. Another version is for non-hazardous environments. The difference between those two is the number of sensors which are allowed to be connected to the PLICSMOBILE T81. The radio part is identical.

The electronics unit consists of two parts:

- Mainboard: PMT81HFG or PMT81EXHFG
- Antenna feed through board: PMT81-ANT

The housing of the PLICSMOBILE T81 is available in plastic, stainless steel and aluminum.

Housing material	HVIN
Plastic	PMT81R
Aluminum	PMT81D
Stainless Steel	PMT81W

## 3. Power Supply

Power is supplied via a standard low voltage source (external power supply unit/battery/accumulator/solar panel) provided by the user.

The PLICSMOBILE T81 normally supplies power to the connected sensors.

Power supply PLICSMOBILE T81 – technical data	
Operating voltage	9.6...32 V DC
Power consumption	
- Power saving mode (9 V/12 V)	0.18 mW/0.3 mW
- Power saving mode (24 V/32 V)	1.8 mW/3.7 mW
- Permanent operation	1.1 W
- Peak power (measured value transmission)	11 W
Power requirement	
- Measurement cycle incl. transmission	15 mWh
Sensor power supply	
- Off-load voltage	34 V (31 V with Ex version)
- Max. current	80 mA (26 mA with Ex version)

## 4. System Description of the Transmit- and Receive Part

The RF frontend of the PLICSMOBILE T81 comprises two Tx/Rx-modules (Bluetooth-module, Wireless-module) and one Rx-module (GNSS-receiver). The RF ports of all modules are combined to a single multiband antenna. The block diagram of this structure is shown in figure 1.

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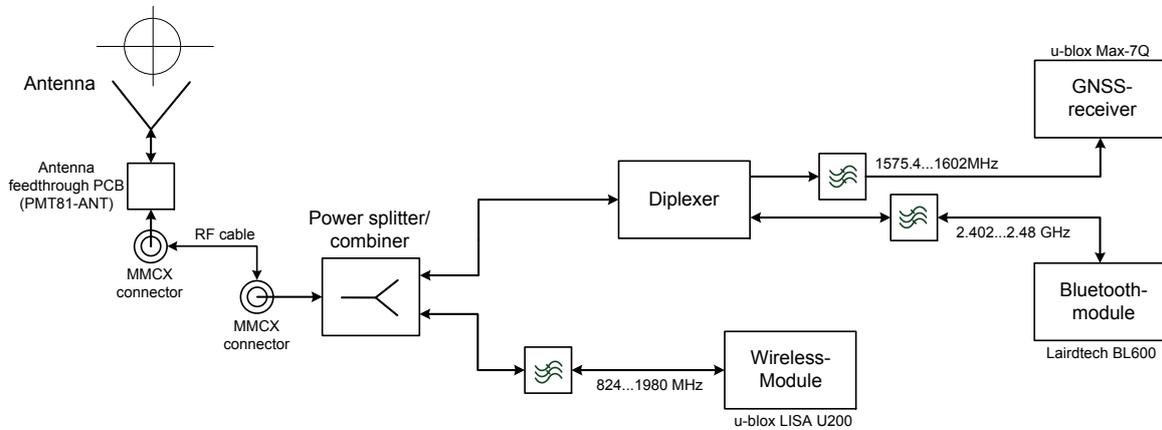


Figure 1: Block diagram of transmit- and receive-part

## 5. RF Data of the Transmit Signals

### 5.1 Wireless-Module – u- blox LISA u200

FCC ID: XPYLISAU200

IC: 8595A-LISAU200N

Mobile standard		Min. frequency [MHz]	Max. frequency [MHz]	Remarks
GSM 850	Uplink	824	849	Module transmit
	Downlink	869	894	Module receive
E-GSM 900	Uplink	880	915	Module transmit
	Downlink	925	960	Module receive
DCS 1800	Uplink	1710	1785	Module transmit
	Downlink	1805	1880	Module receive
PCS 1900	Uplink	1850	1910	Module transmit
	Downlink	1930	1990	Module receive
UMTS 800 (band VI)	Uplink	830	840	Module transmit
	Downlink	875	885	Module receive
UMTS 850 (band V)	Uplink	824	849	Module transmit
	Downlink	869	894	Module receive
UMTS 900 (band VIII)	Uplink	880	915	Module transmit
	Downlink	925	960	Module receive
UMTS 1700 (band IV)	Uplink	1710	1755	Module transmit
	Downlink	2110	2155	Module receive
UMTS 1900 (band II)	Uplink	1850	1910	Module transmit
	Downlink	1930	1990	Module receive
UMTS 2100 (band I)	Uplink	1920	1980	Module transmit
	Downlink	2110	2170	Module receive

Table 1: Operating RF frequency bands (extracted from datasheet)

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Mobile standard	Typ. output power [dBm]	Remarks
GSM 850/E-GSM 900	32.5	Uplink burst RF power for GSM or GPRS1-slot TCH at PCL 5 or Gamma 3
	32.5	Uplink burst RF power for GPRS 2-slot TCH at Gamma 3
	31.7	Uplink burst RF power for GPRS 3-slot TCH at Gamma 3
	30.5	Uplink burst RF power for GPRS 4-slot TCH at Gamma 3
	27.0	Uplink burst RF power for EDGE 8PSK1-slot TCH at PCL 8 or Gamma 6
	27.0	Uplink burst RF power for EDGE 8PSK2-slot TCH at Gamma 6
	26.2	Uplink burst RF power for EDGE 8PSK3-slot TCH at Gamma 6
	25.0	Uplink burst RF power for EDGE 8PSK4-slot TCH at Gamma 6
DCS 1800/ PCS 1900	29.5	Uplink burst RF power for GSM or GPRS1-slot TCH at PCL 0 or Gamma 3
	29.5	Uplink burst RF power for GPRS 2-slot TCH at Gamma 3
	28.7	Uplink burst RF power for GPRS 3-slot TCH at Gamma 3
	27.5	Uplink burst RF power for GPRS 4-slot TCH at Gamma 3
	26.0	Uplink burst RF power for EDGE 8PSK1-slot TCH at PCL 2 or Gamma 5
	26.0	Uplink burst RF power for EDGE 8PSK2-slot TCH at Gamma 5
	25.2	Uplink burst RF power for EDGE 8PSK3-slot TCH at Gamma 5
	24.0	Uplink burst RF power for EDGE 8PSK4-slot TCH at Gamma 5
UMTS 800 (band VI)	23.0	Uplink continuous RF power for RMC at maximum power
UMTS 850 (band V)	23.0	
UMTS 900 (band VIII)	23.0	
UMTS 1700 (band IV)	23.0	
UMTS 1900 (band II)	23.0	
UMTS 2100 (band I)	23.0	

**Table 2: Transmitter maximum output power (extracted from datasheet)**

**5.2 Bluetooth-Module – Laird BL600 ST**

FCC ID: PI4BL600T  
 IC: 1931B-BL600T

Feature		Remarks
Bluetooth	V4.0 – Single Mode	
Frequency	2.402 – 2.480 GHz	
Max. Transmit Power Setting	4 dBm	conducted
Antenna	Connection via trace pads	

**Table 3: Bluetooth-module features (extracted from datasheet)**

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## 6. Integrated Clocking Oscillators

The described oscillators in the following table are used in the PLICSMOBILE T81 electronics unit for clocking purposes.

Module	Oscillators	Frequencies
Cortex M3 CPU	RC	28 MHz
	RC	32768 Hz
Bluetooth-module	Crystal	16 MHz
	Crystal	32768 Hz
HART-modem	Crystal	3.68 MHz
RTC	Crystal	32768 Hz
Wireless-module	Crystal	26 MHz
	Crystal	32768 Hz
GNSS-Receiver	Crystal	26 MHz
	Crystal	32 kHz

## 7. Assembly

The antenna and the housing, including the electronics unit is one entity. The electronics unit itself can be removed or replaced by the customer. The RF-port which is located on the mainboard (PMT81HFG or PMT81EXHFG) of the sensor electronics is accessible through an MMCX RF-connector. This port is connected to the antenna by means of a short RF cable (ca. 10 cm RG 316 with MMCX connectors).

There is only one antenna available which is attached to the housing of the PLICSMOBILE T81.

The technical antenna data can be found in the provided datasheet and the radiation patterns document.