I. FUNCTIONALITY

ATM001 configure functionality like low power, wake up source, Ready To Use mode (RTU).

Bit 0 set on/off low power mode, it is off by default.

Bit 1 define the wakeup pin, set to 0 it will be the WakeUp pin (17), set to 1 it will be the Uart Rx pin (20). Pin list is available in the documentation.

Bits 2 to 7 are unused for now. It is advised to set them to 0.

A. LOW POWER

Low power mode is used to achieve the lowest power consumption possible. When it is sleeping the device cannot be accessed in any way, it has to be woken up before.

When the mode Low Power is on, it can be configured to be controlled with the Wake Up pin or the Uart Rx pin. Both of these mode have distinct mode of functionment.

A quick summary of these modes is displayed in Table 1. Further details are in followings parts I.A.1 page 2, and I.A.2 page 2.

Table 1: Low Power mode summary

Wake up configured on:	Wake Up pin	Uart Rx pin
Waking up if:	Device is sleeping and there is a rising edge on the Wake Up Pin.	Device is sleeping and there is a falling edge on Uart Rx Pin
Waking up time	Min 13 ms, typical 15 ms	Min 13 ms, typical 15 ms
Stay awake if:	Wake Up pin set to '1' or something to do[1].	Something to do.
Go to sleep if:	If Wake Up pin set to '0' and nothing to do[2] for 10 ms.	If nothing to do for 100 ms.

It is important to know that the device will finish his emission cycle Tx/Rx before going to sleep.

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[1] Something to do: The device has something to do when it is in command mode or it has an emission cycle running or there is undealt data in a buffer.

[2] Nothing to do: The device has nothing to do when it is not in command mode and it has no running emission cycle and every buffers are empty (every data has been dealt with).

1. Waking source: WakeUp pin

When the mode Low Power is on and configured to be controlled with the Wake Up pin, it responds to the following cycle.

- If the WakeUp pin is set to '1' the device will stay awake.
- If the WakeUp pin is set to '0' the device will go to sleep after 10 ms without actions.
- If there is a rising edge and the device is sleeping, it will awake.
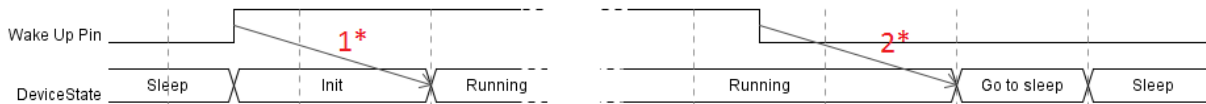- If there is a rising edge and the device is running, it will continue running.

Figure 1: Timing for Low Power On, programmed to wake up on wake up pin

Figure 1 shows a chronogram of the device state when configured to wake up on the Wake Up pin.

The device will go in sleep mode after 10 ms without any actions (eg: 2*).

When sleeping, it will be awaken by rising edge on the Wake Up pin (eg: 1*).

Every data sent to the device by any way[3] during initialisation mode (before Running mode) will be lost. Minimum time and typical time to wait are displayed in Table 1 page 1.

2. Waking source: Uart Rx pin

Wake up on Uart is not native. It is advised to wait around 20 ms after waking it up to be sure that the device is awaken before trying to communicate with it.

When the mode Low Power is on and configured to be controlled with the Uart Rx pin, it responds to the following cycle.

- If the device is running, it will go to sleep after at least 100 ms without any actions.
- If there is a falling edge and the device is sleeping, it will awake.
- If there is a falling edge and the device is running, it will be dealt as an incoming Uart communication.
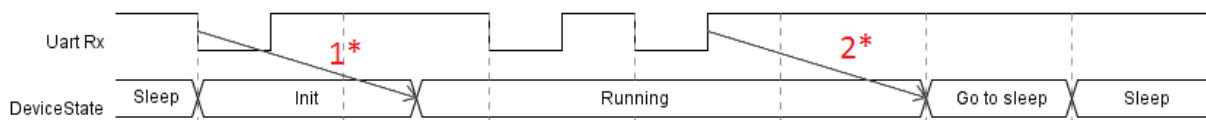

Figure 2: Timing for Low Power On, programmed to wake up on Uart Rx pin

Figure 2 shows a chronogram of the device state when configured to wake up on Uart Rx pin.

The device will go to sleep mode after 100 ms without any actions (eg: 2*).

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[3] For example by radio or by serial

When sleeping, it will be awaken by falling edge on the Uart Rx pin (eg: 1*). It is necessary to send character null (0x00) to awake device.

Every data sent during initialisation mode (before Running mode) will be lost. Minimum time and typical time to wait are displayed in Table 1 page 1.

ATM	Bit	Parameter	Register value
000	0	Module configuration	0: Local (TBD) 1: Network (Wan)
	1	Local modulation	0: FSK only used in local (P2P) (TBD) 1: LoRaonly used in local (P2P) (TBD)
	2:3	LoRaWan class	00: Class A only used in Network 01: Class B only used in Network (TBD) 10: Class C only used in Network (TBD)
	4:7	UNUSED	
001	0	Low power mode	0: Low power mode disable 1: Low power mode enable
	1	Low power waking source	0: Set on WakingUp pin (17) 1: Set on UartRx pin (20)
	2:7	UNUSED	