

# TB8100 Power Saving Modes

## Introduction

The TB8100's state-of-the-art RF performance has not been compromised. It can key up from 0% to 90% full power (100 W) in just 1 millisecond. The power supply must be ready to suddenly deliver hundreds of watts to the PA, without adversely affecting receiver performance. Moreover, the high performance receiver has fully digitised demodulation and audio stages, guaranteeing permanent and accurate performance.

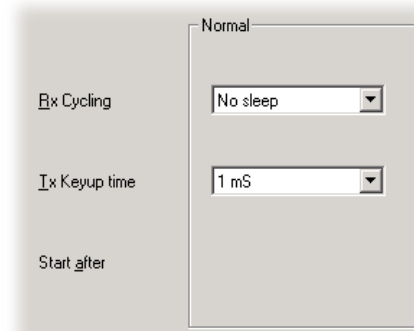
Naturally, this high performance has a downside: increased power consumption. To overcome this, Tait has developed an advanced software control system to systematically power down circuitry whenever time permits. This highly configurable system is designed for battery and solar powered sites, and lets you obtain the best trade-off between power consumption and quality of service.

While the basic TB8100 does have limited power saving capabilities, a Power Saving Modes licence and a Power Management Unit with a standby module are needed for optimal power saving.

## Basic Power Saving

The basic TB8100 lets you choose a level of power saving that is applied equally in all situations. This is done indirectly by selecting a transmit keyup time and a receiver cycling time. The longer the transmit keyup time you select, the more circuitry will be turned off.

The first step disables the exciter output circuitry and puts the PA into a (relatively) idle mode. The next step runs the PMU in Hysteresis mode (the PMU is mainly switched off, but turns back on periodically to maintain voltage levels as needed). The final step is achieved with a keyup time of 20 milliseconds, which permits the exciter synthesiser to be powered down as well.



If it is not necessary for the receiver to run continuously, additional savings can be gained by turning the receiver off and then on again for a brief period (to check if there is a signal).

This is referred to as *receiver cycling*. You can select a receiver cycling time of 0, 5, 10, or 20 ms; this is generally not noticeable to users.

## Features

### Full Power Saving

A Power Saving Modes licence gives you all the TB8100's power saving capabilities. You can configure a power saving level for three different modes (Normal, Sleep, and Deep Sleep) and determine how the base station makes the transitions into these sleep modes.

### Sleep Mode

In this mode, the receiver cycling time can be as slow as 200 ms. The PA is set to idle, both the exciter and receiver synthesisers will be rested, and the PMU will remain in Hysteresis mode.

## Deep Sleep Mode

In this mode the receiver cycling time can be as slow as one second. This gives the TB8100 time to switch off the main PMU submodule (the DC-DC converter) and run using just the standby supply submodule. Because this standby supply provides 10 W and only powers the reciter, power savings are dramatic.

If there is line or signal activity, the power supply is completely re-booted to wake the system. The standby supply has been carefully optimised to power just a single reciter, which means that the main PMU submodule is not switched off if the subrack has more than one reciter.

## Transitions between Modes

In addition to configuring three power saving modes, you can also specify how long the base station runs in a mode before making the transition to the next mode. This enables you to switch more circuitry off during quiet times and to have a quicker response when there is more traffic.

The base station always powers up into **Normal mode**, and after being idle for the prescribed time, it automatically goes into **Sleep mode**. Power consumption drops accordingly.

After being idle for another prescribed time, the base station goes into **Deep Sleep Mode**, where power consumption is at its lowest.

At any time, should activity occur, the base station immediately returns to **Normal Mode**. This means that a delay occurs only at the very first key-up of a repeater; subsequent key-ups experience normal service.

## Further scope for power reductions

System designers developing low power sites should consider the following options for further reducing power consumption:

## No System Interface Board

The TB8100 can function as a complete repeater without a system interface board, provided that it doesn't need any audio or digital lines. This will certainly save power.

## Simplified Control Panel

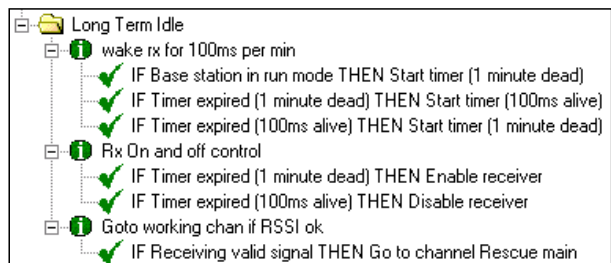
There will be three versions of the control panel. The simplest one, which doesn't support microphone operation, consumes the least power.

## Task Manager Capabilities

For installations where the base station may not be needed for a considerable time, Task Manager could provide further power reductions by putting the system to sleep for extended periods. It could be woken by an external stimulus or after a pre-defined time has elapsed. In particular the *Disable receiver* and *Disable transmitter* actions actually cut power to these systems. The Power Saving Modes license is required for this.

## Channel Profiles with Different Power Saving Settings

Power saving is enabled and configured in channel profiles. You can define different power saving strategies in different channel profiles, and then configure two channels that are identical except for their power saving settings. For example, a search and rescue system could be left on a very economical channel, and then switched to a responsive channel when a rescue gets under way.



	Normal	<input checked="" type="checkbox"/> Sleep	<input checked="" type="checkbox"/> Deep Sleep
Bx Cycling	No sleep	50 mS	1 second
Ix Keypup time	1 mS	40 mS	40 mS
Start after		1 minute idle	1 minute idle 10 minute idle 30 minute idle 1 hour idle 2 hours idle 6 hours idle

## Software Licencing

The TB8100 has a range of powerful capabilities, but some of them are only available with a licence. Tait's software licencing scheme means that you can select and pay for those features that the network will use. You can either order a base station with the features you need already licenced or obtain licence keys later on.

A licence key is an encrypted code that only works for a single reciter. (Different features require different keys.) You can receive—via e-mail—a key as a small file with a .key extension. You save this file in the Service Kit's licence folder and use it to enable the particular feature you want

