

Current State	Event				Next State
MIN_BPM	p_rateModulation == e_off				---
	p_rateModulation == e_on	k_currentActivity < p_activityThreshold			---
		k_currentActivity ≥ p_activityThreshold	After(k_hysWaitDelay)		UP_BPM
			NOT(After(k_hysWaitDelay))		---
UP_BPM	p_rateModulation == e_off				MIN_BPM
	p_rateModulation == e_on	k_current activity < p_activityThreshold	After(k_rateChangeDelay)		SAME_BPM
			NOT(After(k_rateChangeDelay))		---
		k_currentActivity ≥ p_activityThreshold	After(k_rateChangeDelay)	k_BPM + p_modulationSensitivity ≤ p_upperRateLimit	UP_BPM
				k_BPM + p_modulationSensitivty > p_upperRateLimit	MAX_BPM
			NOT(After(k_rateChangeDelay))		---
SAME_BPM	p_rateModulation == e_off				MIN_BPM
	p_rateModulation == e_on	k_currentActivity < p_activityThreshold	After(k_hysWaitDelay)		DOWN_BPM
			NOT(After(k_hysWaitDelay))		---
		k_currentActivity ≥ p_activityThreshold	After(k_hysWaitDelay)		UP_BPM
NOT(After(k_hysWaitDelay))			---		
DOWN_BPM	p_rateModulation == e_off				MIN_BPM
	p_rateModulation == e_on	k_currentActivity < p_activityThreshold	After(k_rateChangeDelay)	k_BPM - p_modulationSensitivity ≥ p_lowerRateLimit	DOWN_BPM
		k_currentActivity ≥ p_activityThreshold	After(k_rateChangeDelay)	k_BPM - p_modulationSensitivity < p_lowerRateLimit	MIN_BPM
			NOT(After(k_rateChangeDelay))		---
MAX_BPM	p_rateModulation == e_off				MIN_BPM
	p_rateModulation == e_on	k_currentActivity < p_activityThreshold	After(k_hysWaitDelay)		DOWN_BPM
			NOT(After(k_hysWaitDelay))		---
		k_currentActivity ≥ p_activityThreshold			---

MIN_BPM

ENTRY:

%Min bpm is lower rate limit

$k_bpm = p_lowerRateLimit;$

UP_BPM

ENTRY:

%New bpm is current bpm plus modulation rate

$k_bpm = k_bpm + p_modulationSensitivity;$

SAME_BPM

ENTRY:

%No change in bpm

DOWN_BPM

ENTRY:

%New bpm is current bpm minus modulation rate

$k_bpm = k_bpm - p_modulationSensitivity;$

MAX_BPM

ENTRY:

%Max bpm is upper rate limit

$k_bpm = p_upperRateLimit;$

$p_rateModulation \{e_off, e_on\}$ – is rate modulation enabled or disabled

$k_currentActivity \{double\}$ – RMS average of the accelerometer readings

$p_activityThreshold \{double\}$ – programmed threshold to initiate rate modulation

$k_hysWaitDelay \{uint16\}$ – delay to account for hysteresis effects

$k_rateChangeDelay \{uint16\}$ – delay specifying how often to change bpm

$p_modulationSensitivity \{uint8\}$ – specifies how much the rate should change per event

$p_lowerRateLimit \{uint8\}$ – lower end bpm rate

$p_upperRateLimit \{uint8\}$ – upper end bpm rate