Current State	Event				Next State
MIN_BPM	p_rateModulation == e_off				---
	p_rateModulation == e_on	k_currentActivity < p_activityThreshold	After(k_hysWaitDelay)		---
		k_currentActivity ≥ p_activityThreshold	After(k_hysWaitDelay)		UP_BPM
UP_BPM	p_rateModulation == e_off				MIN_BPM
	p_rateModulation == e_on	k_current activity < p_activityThreshold	After(k_rateChangeDelay)		SAME_BPM
		k_currentActivity ≥ p_activityThreshold	After(k_rateChangeDelay)	k_BPM + p_modulationSensitivity ≤ p_upperRateLimit	---
				k_BPM + p_modulationSensitivty > p_upperRateLimit	MAX_BPM
SAME_BPM	p_rateModulation == e_off				MIN_BPM
	p_rateModulation == e_on	k_currentActivity < p_activityThreshold	After(k_hysWaitDelay)		DOWN_BPM
		k_currentActivity ≥ p_activityThreshold	After(k_hysWaitDelay)		UP_BPM
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	---
		k_currentActivity ≥ p_activityThreshold	After(k_rateChangeDelay)	k_BPM - p_modulationSensitivity < p_lowerRateLimit	MIN_BPM
MAX_BPM	p_rateModulation == e_off				MIN_BPM
	p_rateModulation == e_on	k_currentActivity < p_activityThreshold	After(k_hysWaitDelay)		DOWN_BPM
		k_currentActivity ≥ p_activityThreshold	After(k_hysWaitDelay)		---

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