REVA L-ion - CONTROLLER PARAMETERS (Rev -01) DATE: 15.06.2009								
Program					Value	Min	Max	Unit	Actual
	Forward Type				0	0	1		
	High Regen Setting								
		High Power Time			0.2	0.1	5	Seconds	
		High Power			130	0	1000	Ampere	
		Regen Power Time			0.2	0.1	5	Seconds	
		Regen Power			10	0	1000	Ampere	
		Normal Power Time			0.2	0.1	5	Seconds	
	Boost Params								
		Base Speed			50	0	100	%	
		Delta Speed			55	0	100	%	
		DrvNominal			100	0	100	%	
		DrvBPDelta			100	0	100	%	
		Drv2BPDelta			100	0	100	%	
		Drv4BPDelta			100	0	100	%	
		Drv8BPDelta			100	0	100	%	
		Max Speed			100	0	100	%	
	LOS Encoder								
		Encoder Max Speed			2000	100	2000	rpm	
		Encoder Min Speed			100	100	2000	rpm	
		Encoder Max Current			350	100	650	Ampere	
		Encoder Max Mod Depth			50	15	100	%	
		Encoder Stall Time			5	1	10	Seconds	
	LOS MotorTemp								
		Max Speed			6000	100	6000	rpm	
	Motor Cooling Fan								
		On Temp			200	0	200	deg C	
		Off Hysterisis			10	1	100	deg C	
	Control Mode Select				2	1	2		
	1 - Speed Control Mode								
		Speed Controller							
			Max Speed		6000	50	6000	rpm	
			Kp		30	0	100	%	
			Ki		20	5	100	%	
			Vel Feedforward						
				Kvff	0	0	200	Ampere	
				Build Rate	0.7	0.1	5	Seconds	
				Release Rate	0.2	0.1	2	Seconds	
			Acc Feedforward						
				Kaff	0	0	500	Ampere	
				Kbff	0	0	500	Ampere	
				Build Rate	0.4	0.1	5	Seconds	
				Release Rate	0.2	0.1	2	Seconds	
		Response							
			Full Accel Rate HS		6	0.5	30	Seconds	
			Full Accel Rate LS		2	0.5	10	Seconds	
			Low Accel Rate		20	0.5	30	Seconds	
			Neutral Decel Rate HS		30	1	30	Seconds	
			Neutral Decel Rate LS		30	1	30	Seconds	
			Full Brake Rate HS		1	0.5	10	Seconds	
			Full Brake Rate LS		2.5	1	10	Seconds	
			Low Brake Rate		8	2	30	Seconds	

Parameters should be checked in "Neutral mode" only !

			Fine Tuning						
				Partial Decel Rate	30	5	30	Seconds	
				HS (High Speed)	70	0	100	%	
				LS (Low Speed)	30	0	100	%	
				Reversal Soften	20	0	100	%	
				Max Speed Accel	0.1	0.1	30	Seconds	
				Max Speed Decel	10	0.1	30	Seconds	
				Accel Release Rate	50	0	100	%	
		Pump Enable			0	0	1		
	2 - Torque Control Mode								
		Speed Limiter							
			Max Speed		6000	500	6000	rpm	
			Kp		30	0	100	%	
			Ki		30	0	100	%	
			Kd		0	0	100	%	
		Response							
			Accel Rate		0.4	0.1	5	Seconds	
			Accel Release Rate		0.8	0.1	2	Seconds	
			Brake Rate		0.6	0.1	5	Seconds	
			Brake Release Rate		0.3	0.1	2	Seconds	
			Neutral Braking		17	0	100	%	
			Neutral Taper Speed		2000	200	6000	rpm	
			Fine Tuning						
				Creep Torque	0	0	100	%	
				Gear Soften	40	0	100	%	
				Brake Taper Speed	2000	200	6000	rpm	
				Reversal Soften	40	0	100	%	
				Max Speed Decel	10	0.1	30	Seconds	
	Restraint								
		Restraint Forward			25	0	100	%	
		Restraint Back			90	0	100	%	
		Position Hold Enable			0	0	1		
		Position Hold							
			Kp		25	2	100	%	
			Kp Deadband (motor degrees)		20	0	720		
			Kd		15	0	100	%	
			Entry Rate		100	2	100	%	
	Current Limits								
		Drive Current Limit			100	0	100	%	
		Regen Current Limit			100	0	100	%	
		Brake Current Limit			100	0	100	%	
		Power Limiting Map							
			Base Speed		2000	100	4000	rpm	
			Delta Speed		550	50	1000	rpm	
			Drive Limiting Map						
				Nominal	100	0	100	%	
				Base Plus Delta	100	0	100	%	
				Base Plus 2xDelta	100	0	100	%	
				Base Plus 4xDelta	100	0	100	%	
				Base Plus 8xDelta	100	0	100	%	

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			Regen Limiting Map						
				Nominal	80	0	100	%	
				Base Plus Delta	80	0	100	%	
				Base Plus 2xDelta	80	0	100	%	
				Base Plus 4xDelta	80	0	100	%	
				Base Plus 8xDelta	80	0	100	%	
	Throttle								
		Throttle Type			2	1	5		
		Forward Deadband			0.6	0	5	Volt	
		Forward Map			50	0	100	%	
		Forward Max			3.25	0	5	Volt	
		Forward Offset			0	0	100	%	
		Reverse Deadband			0.6	0	5	Volt	
		Reverse Map			50	0	100	%	
		Reverse Max			3.25	0	5	Volt	
		Reverse Offset			0	0	100	%	
		HPD/SRO Enable			1	0	1		
		Sequencing Delay			0.1	0	5	Seconds	
	Brake								
		Brake Pedal Enable			1	0	1		
		Brake Type			2	1	5		
		Brake Deadband			0.82	0	5	Volt	
		Brake Map			50	0	100	%	
		Brake Max			1.26	0	5	Volt	
		Brake Offset			0	0	100	%	
	EM Brake Control								
		Enable			0	0	1		
		Brake PWM			70	0	100	%	
		Set Delay			1	0.1	5	Seconds	
		Release Delay			0.2	0.1	2	Seconds	
		Forward Speed Threshold			20	1	100	rpm	
		Torque Preload Enable			1	0	1		
		Torque Preload Delay			0.09	0.03	0.3	Seconds	
		Torque Preload Cancel Delay			10	0	120	Seconds	
	Drivers								
		Main Contactor							
			Main Enable		1	0	1		
			Pull In PWM		100	0	100	%	
			Holding PWM		80	0	100	%	
			Interlock Type		1	0	2		
			Open Delay		0	0	40	Seconds	
			Checks Enable		1	0	1		
			Precharge Enable		1	0	1		
		Proportional Driver							
			PD Enable		0	0	1		
			Hyd Lower Enable		0	0	1		
			PD Max Current		2	0	2	Ampere	
			PD Min Current		0.05	0	2	Ampere	
			PD Dither %		0	0	100	%	
			PD Dither Period		16	16	112	ms	
			PD Kp		10	0	100	%	
			PD Ki		10	0	100	%	

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		Fault Checking						
			Driver 1 Checks Enable	0	0	1		
			Driver 2 Checks Enable	0	0	1		
			Driver 3 Checks Enable	0	0	1		
			Driver 4 Checks Enable	0	0	1		
			PD Checks Enable	0	0	1		
			EM Brake Disable Upon Fault	0	0	1		
			External Supply Max	200	5	200	mAmpere	
			External Supply Min	5	5	200	mAmpere	
	Motor							
		Typical Max Speed		6000	500	6000	rpm	
		Swap Encoder Direction		0	0	1		
		Swap Two Phases		0	0	1		
		Encoder Steps		64	4	256		
		Encoder SW Fault Enable		1	0	1		
		Temperature Control						
			Sensor Enable	1	0	1		
			Temperature Hot	132	0	250	deg C	
			Temperature Max	145	0	250	deg C	
			Current Source	1	0	1		
			MotorTemp LOS Max Speed	6000	100	3000	rpm	
			Sensor Type	3	0	5		
			Sensor Temp Offset	0	-20	20	deg C	
			User Defined Sensor (Type 0)					
				Sensor 0	0.82	0	10	Volt
				Temp 0	-40	-50	250	deg C
				Sensor 1	1.38	0	10	Volt
				Temp 1	30	-50	250	deg C
				Sensor 2	2	0	10	Volt
				Temp 2	90	-50	250	deg C
				Sensor 3	2.7	0	10	Volt
				Temp 3	150	-50	250	deg C
				Sensor 4	3.34	0	10	Volt
				Temp 4	200	-50	250	deg C
	Battery							
		Nominal Voltage		50	24	84	Volt	
		User Overvoltage		115	115	200	%	
		User Undervoltage		80	50	80	%	
		Reset Volts Per Cell		2.09	0.9	3	Volt	
		Full Volts Per Cell		2.04	0.9	3	Volt	
		Empty Volts Per Cell		1.73	0.9	3	Volt	
		Discharge Time		34	0	600	Minutes	
		BDI Reset Percent		75	0	100	%	
	Vehicle							
		Metric Units		1	0	1		
		Speed to RPM		96.8	10	3000		
		Capture Speed		3870	0	8000	rpm	
		Capture Distance 1		22	1	1320		
		Capture Distance 2		100	1	1320		
		Capture Distance 3		150	1	1320		

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	Emergency Reverse						
		EMR Enable	0	0	1		
		EMR Type	1	0	1		
		EMR Current	100	0	100	%	
		EMR Speed	750	50	6000	rpm	
		EMR Accel Rate	0.1	0.1	3	Seconds	
		EMR Speed Decel Rate	0.1	0.1	3	Seconds	
		EMR Torque Decel Rate	0.5	0	0.5	Seconds	
	CAN Interface						
		CAN open Interlock	0	0	1		
		Master ID	1	0	3		
		Slave ID	7	0	31		
		Baud Rate	0	0	2		
		Heartbeat Rate	100	16	200	ms	
		PDO Timeout Period	100	0	200	ms	
		Emergency Message Rate	16	16	200	ms	
		Suppress CANopen Init	1	0	1		
	Motor Control Tuning						
Rev -01		Motor Type	40	0	100		
Page 5of 5		Base Speed	2000	200	6000	rpm	

Important Note: Parameters like Accelerators and Brake should be checked/ adjusted only in Neutral mode.
Parameters allowed to change only if required (Due to mechanical mismatches in the pedals) are listed below,
1) Accelerator and 2) Brake
No other parameters are allowed to change unless untill a new parameter list is released by R & D with date.

1. Accelerator			Note:
	Forward Deadband	eg. 0.6	a. Forward Deadband and Reverse Deadband values should be same
	Forward Max	eg. 3.5	b. Forward Max and Reverse Max values should be same
	Reverse Deadband	eg. 0.6	
	Reverse Max	eg. 3.5	
2. Brake			
	Brake Deadband		
	Brake Max		

Parameters should be checked in "Neutral mode" only !

These settings are intended to be used with motors having BMH - 6206 sensor bearing