

CURTIS AC Motor Controller Parameter List

Model: 1234-5371

Parameter	Default Value	Min	Max	Unit	Access Level	
					Read	Write
Multimode Functions						
M1 Forward Max Speed	3000	0	8000	rpm	User	User
M2 Forward Max Speed	3000	0	8000	rpm	User	User
M1 Reverse Max Speed	3000	0	8000	rpm	User	User
M2 Reverse Max Speed	3000	0	8000	rpm	User	User
Hydraulic Functions						
Lift Lockout Enable	On	Off	On		User	User
Lift Lockout BDI	20	0	100	%	User	User
Hydraulic Inhibit	On	Off	On		User	User
Lower Valve PWM	100	0	100	%	User	User
HourMeter Preset						
10s of Hours	0	0	20000		Dealer	Dealer
Remaining HRs in Mins	0	0	600		Dealer	Dealer
Preset Total Hourmeter	Off	Off	On		Dealer	Dealer
Preset Traction Hourmeter	Off	Off	On		Dealer	Dealer
Preset Pump Hourmeter	Off	Off	On		Dealer	Dealer
<u>Control Mode Select</u>	<u>0</u>	<u>0</u>	<u>2</u>		<u>OEM</u>	<u>OEM</u>
0 - Speed Mode Express						
Max Speed	3000	100	8000	rpm	OEM	OEM
Kp	30	0	100	%	OEM	OEM
Ki	30	5	100	%	OEM	OEM
Accel Rate	2.5	0.1	30	Seconds	OEM	OEM
Decel Rate	10	0.1	30	Seconds	OEM	OEM
Brake Rate	1	0.1	30	Seconds	OEM	OEM
Pump Enable	Off	Off	On		OEM	OEM
1 - Speed Mode						
Speed Controller						
Max Speed	3000	100	8000	rpm	OEM	OEM
Kp	30	0	100	%	OEM	OEM
Ki LS	30	5	100	%	OEM	OEM
Ki HS	30	5	100	%	OEM	OEM
Vel Feedforward						
Kvff	0	0	500	Ampere	OEM	OEM
Build Rate	1	0.1	5	Seconds	OEM	OEM
Release Rate	0.4	0.1	5	Seconds	OEM	OEM
Acc Feedforward						
Kaff	0	0	500	Ampere	OEM	OEM
Kbff	0	0	500	Ampere	OEM	OEM
Build Rate	1	0.1	5	Seconds	OEM	OEM
Release Rate	0.4	0.1	5	Seconds	OEM	OEM
Response						

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					Read	Write
Full Accel Rate HS	5	0.1	30	Seconds	OEM	OEM
Full Accel Rate LS	2.5	0.1	30	Seconds	OEM	OEM
Low Accel Rate	10	0.1	30	Seconds	OEM	OEM
Neutral Decel Rate HS	10	0.1	30	Seconds	OEM	OEM
Neutral Decel Rate LS	20	0.1	30	Seconds	OEM	OEM
Full Brake Rate HS	1	0.1	30	Seconds	OEM	OEM
Full Brake Rate LS	2	0.1	30	Seconds	OEM	OEM
Low Brake Rate	4	0.1	30	Seconds	OEM	OEM
Fine Tuning						
Partial Decel Rate	30	0.1	30	Seconds	OEM	OEM
HS (High Speed)	70	0	100	%	OEM	OEM
LS (Low Speed)	30	0	100	%	OEM	OEM
Reversal Soften	20	0	100	%	OEM	OEM
Max Speed Accel	1	0.1	30	Seconds	OEM	OEM
Max Speed Decel	10	0.1	30	Seconds	OEM	OEM
Pump Enable	Off	Off	On		OEM	OEM
2 - Torque Mode						
Speed Limiter						
Max Speed	4000	500	8000	rpm	OEM	OEM
Kp	30	0	100	%	OEM	OEM
Ki	30	5	100	%	OEM	OEM
Kd	10	0	100	%	OEM	OEM
Response						
Accel Rate	1	0.1	30	Seconds	OEM	OEM
Accel Release Rate	0.4	0.1	2	Seconds	OEM	OEM
Brake Rate	1	0.1	5	Seconds	OEM	OEM
Brake Release Rate	0.4	0.1	2	Seconds	OEM	OEM
Neutral Braking	10	0	100	%	OEM	OEM
Neutral Taper Speed	500	200	6000	rpm	OEM	OEM
Fine Tuning						
Creep Torque	0	0	100	%	OEM	OEM
Brake Full Creep Cancel	50	25	100	%	OEM	OEM
Creep Build Rate	0.1	0.1	5	Seconds	OEM	OEM
Creep Release Rate	3	0.1	5	Seconds	OEM	OEM
Gear Soften	20	0	100	%	OEM	OEM
Brake Taper Speed	1000	200	6000	rpm	OEM	OEM
Reversal Soften	20	0	100	%	OEM	OEM
Max Speed Decel	10	0.1	30	Seconds	OEM	OEM
Restraint						
Restraint Forward	50	0	100	%	OEM	OEM
Restraint Back	50	0	100	%	OEM	OEM

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					Read	Write
Soft Stop Speed	0	0	500	rpm	OEM	OEM
Position Hold						
Position Hold Enable	Off	Off	On		OEM	OEM
Kp	10	2	100	%	OEM	OEM
Kd	15	0	100	%	OEM	OEM
Set Speed Settling Time	3013	0	5000	ms	OEM	OEM
Set Speed Threshold	30	5	100	rpm	OEM	OEM
Entry Rate	50	5	100	%	OEM	OEM
Exit Rollback Reduction	50	0	100	%	OEM	OEM
Current Limits						
Drive Current Limit	100	5	100	%	OEM	OEM
Regen Current Limit	100	5	100	%	OEM	OEM
Brake Current Limit	100	5	100	%	OEM	OEM
EMR Current Limit	100	5	100	%	OEM	OEM
Interlock Brake Current Limit	100	5	100	%	OEM	OEM
DC Pump Current Limit	100	5	100	%	OEM	OEM
Power Limiting Map						
PL Nominal Speed	1500	100	4000	rpm	OEM	OEM
Delta Speed	500	50	1000	rpm	OEM	OEM
Drive Limiting Map						
Nominal	100	0	100	%	OEM	OEM
Plus Delta	100	0	100	%	OEM	OEM
Plus 2xDelta	100	0	100	%	OEM	OEM
Plus 4xDelta	100	0	100	%	OEM	OEM
Plus 8xDelta	100	0	100	%	OEM	OEM
Regen Limiting Map						
Nominal	100	0	100	%	OEM	OEM
Plus Delta	100	0	100	%	OEM	OEM
Plus 2xDelta	100	0	100	%	OEM	OEM
Plus 4xDelta	100	0	100	%	OEM	OEM
Plus 8xDelta	100	0	100	%	OEM	OEM
Throttle						
Throttle Type	5	1	5		OEM	OEM
Forward Deadband	0.5	0	5	Volt	OEM	OEM
Forward Map	35	0	100	%	OEM	OEM
Forward Max	4.5	0	5	Volt	OEM	OEM
Forward Offset	0	0	100	%	OEM	OEM
Reverse Deadband	0.5	0	5	Volt	OEM	OEM
Reverse Map	35	0	100	%	OEM	OEM
Reverse Max	4.5	0	5	Volt	OEM	OEM
Reverse Offset	0	0	100	%	OEM	OEM

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					Read	Write
Throttle Filter	10	2	125	Hz	OEM	OEM
HPD SRO Type	1	0	3		OEM	OEM
Sequencing Delay	0.1	0	5	Seconds	OEM	OEM
VCL Throttle Enable	Off	Off	On		OEM	OEM
Brake						
Brake Pedal Enable	Off	Off	On		OEM	OEM
Brake Type	5	1	5		OEM	OEM
Brake Deadband	0.5	0	5	Volt	OEM	OEM
Brake Map	50	0	100	%	OEM	OEM
Brake Max	4.5	0	5	Volt	OEM	OEM
Brake Offset	0	0	100	%	OEM	OEM
Brake Filter	10	2	125	Hz	OEM	OEM
VCL Brake Enable	Off	Off	On		OEM	OEM
EM Brake Control						
Brake Type	0	0	2		OEM	OEM
Pull In Voltage	0	0	100	%	OEM	OEM
Holding Voltage	0	0	100	%	OEM	OEM
Battery Voltage Compensated	On	Off	On		OEM	OEM
Set EM Brake On Fault	On	Off	On		OEM	OEM
Set Speed Threshold	30	5	100	rpm	OEM	OEM
Release Delay	50	40	2000	ms	OEM	OEM
Set Speed Settling Time	3013	0	5000	ms	OEM	OEM
Torque Preload Delay	200	0	800	ms	OEM	OEM
Torque Preload Enable	On	Off	On		OEM	OEM
Torque Preload Cancel Delay	0	0	120	Seconds	OEM	OEM
Drivers						
Main Contactor						
Main Enable	On	Off	On		OEM	OEM
Pull In Voltage	0	0	100	%	OEM	OEM
Holding Voltage	0	0	100	%	OEM	OEM
Battery Voltage Compensated	On	Off	On		OEM	OEM
Interlock Type	0	0	2		OEM	OEM
Open Delay	0.1	0	40	Seconds	OEM	OEM
Checks Enable	On	Off	On		OEM	OEM
Main DNC Threshold	5	0	84	Volt	OEM	OEM
Precharge Enable	On	Off	On		OEM	OEM
Proportional Driver						
PD Enable	Off	Off	On		OEM	OEM
Hyd Lower Enable	Off	Off	On		OEM	OEM
PD Max Current	2	0	2	Ampere	OEM	OEM
PD Min Current	0.05	0	2	Ampere	OEM	OEM

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					Read	Write
PD Dither %	0	0	100	%	OEM	OEM
PD Dither Period	16	16	112	ms	OEM	OEM
PD Kp	10	1	100	%	OEM	OEM
PD Ki	10	1	100	%	OEM	OEM
Hydraulic Contactor						
Contactor Enable	Off	Off	On		OEM	OEM
Pull In Voltage	100	0	100	%	OEM	OEM
Holding Voltage	80	0	100	%	OEM	OEM
Fault Checking						
Driver 1 Checks Enable	On	Off	On		OEM	OEM
Driver 2 Checks Enable	Off	Off	On		OEM	OEM
Driver 3 Checks Enable	Off	Off	On		OEM	OEM
Driver 4 Checks Enable	Off	Off	On		OEM	OEM
PD Checks Enable	Off	Off	On		OEM	OEM
External Supply Max	200	5	200	mAmpere	OEM	OEM
External Supply Min	5	5	200	mAmpere	OEM	OEM
PWM Frequency	200	100	1000	Hz	OEM	OEM
Motor						
Typical Max Speed	4000	500	8000	rpm	OEM	OEM
Swap Encoder Direction	Off	Off	On		OEM	OEM
Swap Two Phases	Off	Off	On		OEM	OEM
Encoder Steps	32	32	256		OEM	OEM
Encoder Fault Setup						
Fault Detection Enable	On	Off	On		OEM	OEM
Fault Stall Time	5	0	10	Seconds	OEM	OEM
LOS Upon Encoder Fault	On	Off	On		OEM	OEM
LOS Max Speed	800	100	2000	rpm	OEM	OEM
LOS Max Current	400	100	650	Ampere	OEM	OEM
LOS Max Mod Depth	50	15	100	%	OEM	OEM
LOS Accel Rate	7	2	15	Seconds	OEM	OEM
LOS Decel Rate	3	2	15	Seconds	OEM	OEM
Temperature Control						
Sensor Enable	On	Off	On		OEM	OEM
Sensor Type	3	1	5		OEM	OEM
Sensor Offset	0	-20	20	deg C	OEM	OEM
Temperature Hot	145	0	250	deg C	OEM	OEM
Temperature Max	160	0	250	deg C	OEM	OEM
MotorTemp LOS Max Speed	800	100	3000	rpm	OEM	OEM
Hydraulics						
Lift Switch Only Enable	Off	Off	On		OEM	OEM
Lower Switch Only Enable	Off	Off	On		OEM	OEM

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					Read	Write
Pump Max PWM	100	10	100	%	OEM	OEM
Pump Accel Rate	0.1	0.1	2	Seconds	OEM	OEM
Pump Decel Rate	0.1	0.1	2	Seconds	OEM	OEM
Lower Accel Rate	0.1	0.1	2	Seconds	OEM	OEM
Lower Decel Rate	0.1	0.1	2	Seconds	OEM	OEM
Load Hold Enable	Off	Off	On		OEM	OEM
Load Hold Delay	48	0	2048	ms	OEM	OEM
Lift BDI Lockout	Off	Off	On		OEM	OEM
Hyd Inhibit Type (HPD)	0	0	3		OEM	OEM
Hyd Throttle						
Hyd Throttle Type	5	1	5		OEM	OEM
Lift Deadband	0.5	0	5	Volt	OEM	OEM
Lift Map	35	0	100	%	OEM	OEM
Lift Max	4.5	0	5	Volt	OEM	OEM
Lift Offset	0	0	100	%	OEM	OEM
Lower Deadband	0.5	0	5	Volt	OEM	OEM
Lower Map	35	0	100	%	OEM	OEM
Lower Max	4.5	0	5	Volt	OEM	OEM
Lower Offset	0	0	100	%	OEM	OEM
VCL Hyd Throttle Enable	Off	Off	On		OEM	OEM
Battery						
Nominal Voltage	24	24	96	Volt	OEM	OEM
Undervoltage Cutback Range	4	2	14	Volt	OEM	OEM
User Overvoltage	125	115	200	%	OEM	OEM
User Undervoltage	70	50	80	%	OEM	OEM
Reset Volts Per Cell	2.09	0.9	3	Volt	Dealer	Dealer
Full Volts Per Cell	2.04	0.9	3	Volt	Dealer	Dealer
Empty Volts Per Cell	1.73	0.9	3	Volt	Dealer	Dealer
Discharge Time	34	0	600	Minutes	Dealer	Dealer
BDI Reset Percent	75	0	100	%	Dealer	Dealer
Dual Drive						
Dual Motor Enable	Off	Off	On		OEM	OEM
i: Dual Motor Slave	Off	Off	On		OEM	OEM
CAN Node ID Other	2	0	127		OEM	OEM
LOS Max Speed	800	100	8000	rpm	OEM	OEM
Master						
Steer Angle Max (deg)	90	45	90		OEM	OEM
Turn Accel Rate	5	0.1	30	Seconds	OEM	OEM
Critical Angle (deg)	70	45	90		OEM	OEM
Max Turn Speed	30	0	100	%	OEM	OEM
Inner Wheel Speed	-100	-100	0	%	OEM	OEM

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					Read	Write
Steer Type	5	1	5		OEM	OEM
Steer Pot Min	0.5	0	5	Volt	OEM	OEM
Steer Pot Zero	2.5	0	5	Volt	OEM	OEM
Steer Pot Max	4.5	0	5	Volt	OEM	OEM
VCL Steer Enable	Off	Off	On		OEM	OEM
Slave						
Turn Accel Rate	5	0.1	30	Seconds	OEM	OEM
Critical Angle (deg)	70	45	90		OEM	OEM
Steer Fault Min	0.25	0	5.5	Volt	OEM	OEM
Steer Fault Max	4.75	0	5.5	Volt	OEM	OEM
Turn Feedforward						
Turn Accel Rate	5	0.1	30	Seconds	OEM	OEM
Turn Kvff	0	0	500	Ampere	OEM	OEM
Turn ff Build Rate	1	0.1	5	Seconds	OEM	OEM
Turn ff Release Rate	0.4	0.1	2	Seconds	OEM	OEM
Vehicle						
Metric Units	Off	Off	On		OEM	OEM
Speed to RPM	253	10	3000		OEM	OEM
Capture Speed 1	4500	0	8000	rpm	OEM	OEM
Capture Speed 2	4500	0	8000	rpm	OEM	OEM
Capture Distance 1	22	1	1320		OEM	OEM
Capture Distance 2	100	1	1320		OEM	OEM
Capture Distance 3	150	1	1320		OEM	OEM
Emergency Reverse						
EMR Enable	Off	Off	On		OEM	OEM
EMR Type	0	0	1		OEM	OEM
EMR Dir Interlock	Off	Off	On		OEM	OEM
EMR Time Limit	3	0	30	Seconds	OEM	OEM
EMR Speed	1000	50	6000	rpm	OEM	OEM
EMR Accel Rate	0.1	0.1	3	Seconds	OEM	OEM
EMR Decel Rate	0.1	0.1	3	Seconds	OEM	OEM
Interlock Braking						
Enable	On	Off	On		OEM	OEM
Decel Rate HS	1.5	0.1	30	Seconds	OEM	OEM
Decel Rate LS	2	0.1	30	Seconds	OEM	OEM
Interlock Brake Timeout	5	0	8	Seconds	OEM	OEM
CAN Interface						
CANopen Interlock	Off	Off	On		OEM	OEM
CAN Node ID	38	0	127		OEM	OEM
Baud Rate	0	-3	2		OEM	OEM
Heartbeat Rate	100	16	200	ms	OEM	OEM

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					Read	Write
PDO Timeout Period	100	0	200	ms	OEM	OEM
Emergency Message Rate	16	16	200	ms	OEM	OEM
Suppress CANopen Init	0	0	1		OEM	OEM
Motor Control Tuning						
Motor Characterization Tests						
Test Enable	0	0	1		OEM	OEM
Test Throttle	0	-1	1		OEM	OEM
Motor Poles	4	2	8		OEM	OEM
Max Test Speed	1000	500	3000	rpm	OEM	OEM
Max Test Current	80	20	100	%	OEM	OEM
SlipGain	3.2	0	200		OEM	OEM
Field Weakening Control						
FW Base Speed	2000	200	6000	rpm	OEM	OEM
Field Weakening	100	0	100	%	OEM	OEM
Weakening Rate	40	0	100	%	OEM	OEM
Min Field Current	0	0	800	Ampere	OEM	OEM
Motor Type	0	0	199		OEM	OEM
Reset Controller	0	0	1		OEM	OEM