				1															Data OUT									RTR Frame			
Implemented?	Command Name	Description	extid	Device Type	Manufacturer API C	lass API Index	x API	Mask		Data IN Length	Data[0]	Data[1]	Data[2]	Data(3)	Data[4]	Data[5]	Data[6]	Data[7]	Data OUT Length	DataOut[0]	DataOut[1]	DataOut[2]	DataOut[3]	DataOut[4]	DataOut[5]	DataOut[6]	DataOut[7]	Length (Data In	Response
Yes	Broadcast Disable	Description Device shall disable immediately when this message is recieved Upon receiving this message the motor controller will stop driving the motor and go to a neutral state. The motor can not be driven again until either a System Reset or System Resume has been received.	0000000	deviceBroadcast	broadcast	0	0 0x00		ALL (ignored)					-	_													,	Not implemented by NI	0 Byte Request	None
		controller will stop driving the motor and																													
		be driven again until either a System Reset or System Resume has been							Individual																						
Partial	Broadcast System Halt	received.	0000040	deviceBroadcast	broadcast	0	1 0x01	64	Device																				Currently the same as Disable	0 Byte Request	None
	Settorint Set	Run the currently set control mode	0000000		054			00000470	Individual Device			Townstee	T	7			[7:3]Reserved [2] ArbFF Units pidSlot[1:0]													Setwint Frame	
TES	Support Set	This command is used to set the output duty cycle of the motor controller in old, cycle of the motor controller in Set of the cycle control mode. The first parameter is a \$2.54 IEEE floating point number is a \$2.54 IEEE floating point number that specifies the output duty cycle and direction. Valid range for this control mode are [-1]. Set the closed loop speed controller, with its 3.254 IEEE floating point number representing the starget speed in RPM Set the closed loop speed controller.	2000040	moiorcomonier	REV	4	I UNU I	33002170	Device	- 0	Tangarquj	nargeq ij	ranges(2)	rarget(3)	ALIXIO	HUQ1)	pasotinj	ravo										_		Serpoint Frame	None
		duty cycle of the motor controller in duty cycle control mode. The first parameter																													
		is a 32-bit IEEE floating point number that specifies the output duty cycle and															[7:3]Reserved														
Yes	Duty Cycle Set	mode are [-1 1].	2050080	motorController	REV	0 :	2 0x02	33882240	Individual Device	8	Target(0)	Target[1]	Target[2]	Target[3]	Aux[0]	Aux[1]	pidSlot(1:0)	ravd												Setpoint Frame	None
		Sets the closed loop speed controller, unit is 32-bit IEEE floating point number							terficiency.								[7:3]Reserved (2) ArbFF Units pidSlot[1:0] (7:3]Reserved (2) ArbFF Units pidSlot[1:0]														
Yes	Speed Set	representing the target speed in RPM Sets the closed inno speed controller	2050480	motorController	REV	1 -	2 0x12	33883264	Device	8	Target(0)	Target[1]	Target[2]	Target[3]	Aux[0]	Aux[1]	pidSlot(1:0)	ravd												Setpoint Frame	None
		representing the target speed in HVM/ Sets the closed loop speed controller, unit is 32-bit IEEE floating point number representing the target speed in RPM. Honors the max acceleration and max velocity from the Smart Motion parameters.																													
		Honors the max acceleration and max velocity from the Smart Motion							Individual								(7:3)Reserved (2) ArbFF Units pidSlot(1:0)														
Yes	Smart Velocity Set	Parameters Sate the shoot loop speed controller	20504C0	motorController	REV	1 :	3 0x13	33883326	Device	8	Target(0)	Target[1]	Target(2)	Target[3]	Aux[0]	Aux[1]	pidSlot(1:0)	ravd													
		Sets the closed loop speed controller, unit is 32-bit IEEE floating point number representing the target position in rotations							Individual								[7:3]Reserved [2] ArbFF Units pidSiot[1:0] [7:3]Reserved [2] ArbFF Units pidSiot[1:0]														
Yes	Position Set	rotations	2050C80	motorController	REV	3 :	2 0x32	33885312	Device	8	Target(0)	Target[1]	Target[2]	Target[3]	Aux[0]	Aux[1]	pidSlot(1:0)	ravd												Setpoint Frame	None
	Voltage Set	rotations Sets the closed loop speed controller, unit is 32-bit IEEE floating point number representing the target voltage in volts.	0054000		on.			33886336	Individual Device		Target(0)	Target(1)	T	Target[3]			(2) ArbFF Units													Setpoint Frame	
TES	vonage ser	Sets the closed loop speed controller,	2001000	moiorcomoner	REV	1	2 0842	33000330			Tangaraj	narget ij	rangen(z)	rarget(3)	ALIXIO	HADE!	[7:3]Reserved	ravo												Serpoint Frame	None
Yes	Current Set	Sets the closed loop speed controller, unit is 32-bit IEEE floating point number representing the target current in Arrps. Sets the closed loop smart motion controller, unit is 32-bit IEEE floating point representing the target position in rotations.	20510C0	motorController	REV	4	3 0x43	33886400	Individual Device	8	Target(0)	Target[1]	Target[2]	Target[3]	Aux[0]	Aux[1]	[7:3]Reserved [2] ArbFF Units pidSlot[1:0]	ravd													
		Sets the closed loop smart motion controller, unit is 32-bit IEEE floating							1								77:31Reserved														
Yes	Smart Motion Set	point representing the target position in rotations.	2051480	motorController	REV	5	2 0x52	33887360	Individual Device		Targed(0)	Target(1)	Taroet(2)	Target(3)	Aux101	Aux[1]	[7:3]Reserved [2] ArbFF Units pidSlot(1:0)	ravd													
											f 0			1	1	1				Applied Output				Sticky Faults	000.00		InvertiBrake		No response to calling this irame direction. Status 0 irame out is periodic	One - to F 10-4	
Partial	Periodic Status 0	Set status frame period - default 10ms	2051800	motorController	REV	6	0 0x60	33888256	Individual Device	2	Frame Period ms(0)	Frame Period ms[1]							8	LSB	Applied Output MSB	Faults LSB	Faults MSB	LSB	Sticky Faults MSB	Ravd	Settings, Is Follower	6	rame out is periodic	Status In Frame (Set frame period)	None
		Set status frame period - default 20ms	1						Individual		L	Frame Period	1							L	l I		L	L	L	Motor Current LSB 4 bits Motor Voltage MSB 4 bits				L	
Partial	Periodic Status 1		2051840	motorController	REV	6	1 0x61	33888320	Individual Device	2	Frame Period ms(0)	Frame Period ms[1]								Motor Velocity LSB	Motor Velocity MID_L	Motor Velocity MID_H	Motor Velocity MSB	Motor Temperature	Motor Voltage LSB	Motor Voltage MSB 4 bits	Motor Current MSB			Status in Frame (Set frame period)	None
		All data is 16-bit half precision numbers Set user frame period - default 0 (disabled) Each user frame can output four 16-bit newembers		1																											
Partial	Periodic Status 2	Each user frame can output four 16-bit parameters	2051880	motorController	REV	6	2 0x62	33888384	Individual Device	2	Frame Period ms(0)	Frame Period ms[1]								Motor Position LSB	Motor Position MID_L	Motor Position MID_H	Motor Position MSB	RSVD	RSVD	RSVD	RSVD				
		Set user frame period - default 0 (disabled) Each user frame can output four 16-bit																			adcVoltage 2q8 t8-01				analonPos	analonPna					
1.4.0 and above	Periodic Status 3	Each user frame can output four 18-bit parameters	20518C0	motorController	REV	6	3 0x63	33888446	Individual Device	,	Frame Period ms(0)	Frame Period ms[1]	1							adcVoltage 2q8 [7:0]	adcVoltage 2q8 [8:9] analogVelocity 15q7[0:7]	analogVelocity 15q7[8:15]	analogVelocity 15q7[16:22]	analogPos IEEE Float LSB	analogPos IEEE Float MID LOW	IEEE Float MID HIGH	analogPos IEEE Float MSB				
		Set user frame period - default 0 (disabled) Each user frame can output four 16-bit parameters			r" – †	1										1			·							olt once *					
1.5.0 and above	Periodic Status 4	Each user frame can output four 16-bit	2051000	enotos/Contro	DEV		4 0-64	22000****	Individual	.	Frame Period ms(0)	Frame Period ms[1]	1		1			1	l .	alt encoder velocity IEEE Float LSB	alt encoder velocity IEEE Float MID LOW	velocity IEEE	alt encoder velocity IEEE Float MSB	alt encoder pos	alt encoder pos IEEE Float MID LOW	IEEE Float MID	alt encoder pos IEEE Float MSB			1	
LUA MED MOOVE	r wnon, sollist 4	parameters The first four bytes contain the status directly from the SPI of the DRV832x (STATO and STAT1). See datasheet for	20013000	Jorcomolér	on. v	1	T UADA	33666512	LAVIOR	2		113	1				1		_ *	rodi LOD	- Sat MID LOW	sat Mill niGH	NAK MOD	ALCE FROM USB	LOW TOWN	The same	LUC FIGHT MISS	-			
		(STATO and STAT1). See datasheet for	1								1	1	1										1								
		more details http://www.ti. com/lit/da/symlink/drv8320.pdf	1								1	1	1										1								
		The second 4 bytes contain the faults																													
Vos.	DBV Strain	The second 4 bytes contain the faults and sticky faults as a way to poll instead of relying on the periodic messages.	2051490	enotos/Contro	DEV		0.000	9399****	Individual		1		1		1			1	l .	STATO LSB	STATO MSB	STAT1 LSB	STAT1 MSB	Faults LSB	Faults MSB	Sticky Faults LSB	Sticky Faults	5	Status from SPI of DRV and	0 Byte Request	DRV Status Frame
TES	Drev Status		2001A80	moiorcomoner	REV	-	4 0x6F	330000090	Individual Device Individual Device	- 0				_	_	_	1			SIAIULSB	DIAIUNOD	DIALICOD	SIALLMOD	Paulo Lob	Paulis Moo	LSB	MSG				DRV Status Frame
Yes	Clear Faults	Clear sticky faults Burns flash updating only parameters	2051880	motorController	REV	6 1-	4 0x6E	33889152				+	-	-	_		-											_		0 Byte Request	None
Yes	Config Burn Flash	Burns flash updating only parameters that changed. Can only be done when device is not enabled (for now?).	2051C80	motorController	REV	7	2 0x72	33889406	Individual Device	2	0xA3	0x3A																		0 Byte Request	None
Ves	Set Follower Mode		2051000	motorController	REV	7	3.0v73	33880473	Individual Device		FollowerID[0]	FollowerID[1]	FollowertDI21	Follower(DCS)	Follower Cfolis	FollowerCfe(1)	FollowerCfg[2]	FollowerOfn(3)		FollowertDfff	Follower(D(1)	FollowerID(2)	FollowerIDIN	Follower(Yolf)	FollowerCfg[1]	FollowerCfel21	FollowerCin(%)	Ŀ	s Follower' bit of status frame should indicate success	8 Byte Request	None
		Reset most parameters to their factory defaults. This API does not overwrite contain parameters cutfined in the parameter state. Send a boolean Truck oaks to will be parameter state. Send a boolean frost oaks to turn the parameters to their state. Reset all parameters to their factory defaults, this induces CAN ID and objects. The state of the state of their state																, a				,				, concerning of					
		certain parameters outlined in the																													
Yes	Config Factory Defaults	to also burn the parameter table.	2051D00	motorController	REV	7 .	4 0x74	33889536	Device	5	Burn Table?		0	0 (0 Bool	4															
		Reset all parameters to their factory defaults, this include CAN ID and							Individual						Documentar Turns																
Yes	Config Factory Reset	others. Send a boolean 'True' to also burn the parameter table.	2051D40	motorController	REV	7	5 0x75	33889600		5	Burn Table?			0 0	0 Bool	e															
1.5.0 and above	Identify	Present a visual blink code on the LEDs to identify a particular device	2051D80	motorController	REV	7	6 0x76	33889664	Individual Device	4	Unique ID (If CAN ID = 0)(0)	Unique ID (If CAN ID = 0)[1]	Unique ID (If CAN ID = 01/2)	Unique ID (If CAN ID = 01(3)																	
No	Nark	General Non-acknowledgement	2052000	motorController	REV		0.090	33890304) Davice Individual Davice Individual Davice Individual Davice Individual Davice Individual Davice Individual Davice Any REV Motor 3 Controller Ary REV Motor October																			,	Not implemented	Not implemented	Not implemented
			2052040	motorController	No. V		1 0+81	3303030	Individual																			- f	ect impatriations	Not Used	Not Used
Yes	Ack	General Acknowledge (used by USB)		motorController	MEV	8	1 0x81	33890368	Individual										- 0											Not Used	Not Used
N/A	Broadcast (not a command)		2052400	motorController	REV	9	0 0:00	33891328	Device Any REV	0			-	-	_	_			0												
Yes - INTERNAL ONLY	Heartheat	Heartbeat command for all REV motor controllers	2052480	motorController	REV		2 0 92	33891456	Motor Controller		Enabled[0]	Enabled[1]	Enghlorif21	Enabled(3)	Fnahled(4)	Enabled[5]	Enabled(6)	Frahled(7)												Heartbeat command	None
									Any REV																						
Yes	Sync	Synchronize all REV motor controllers	20524C0	motorController	REV	9	3 0x93	33891520	Controller	0																				0 Byte Request	None
		Cause all REV motor controllers whos IDs are set to 0 to all respond with a																													
		(96-bit unique number hash to 48 bits)																													
		after a random number of ms. Arbitration/auto retry means all																													
		Syndronouse all NELV motion controllers whose Causes all REV motion controllers whose loss are set to 0 to all respond with a mached version of their senial numbers (18-bit unique number I hash to 48 bits) after a random number of ma. Arbitrationisatio neity means all messageas will get through on the busi. Controller now has a list of all hashed libs on the busi and can address by this writing.	1		1 1			1			1		1		1			1					l	1						1	
		It's on the bus and can address by this 48-bit id - collision is possible but	00000		and a				Arry REV Motor		1	1	1								inus	unem									10 D
1.5.0 and above	pusely .	unikély.	2052500	rnotorController	rscV	9	4 0354	33891584	Any REV	- 0		+	+	_	_	_	+		+	In [0]	10[1]	10[2]	in[3]	 				\rightarrow		0 Byte Request	ID Result
1.5.0 and above	IDAssign	Use 32-bit hashed unique ID to assign the CAN ID of the controller	2052540	motorController	REV	9	5 0x95	33891648	Any REV Motor Controller Any REV Motor 3 Controller	5	10(0)	ID[1]	ID[2]	10[3]	CANID(0)			1					l	1						0 Byte Request	None
		This command is sent to request the current firmware version for the motor																													
		controller. This command uniquely addresses a device and only the	1								1	1	1										1								
		addressed device will respond to this message. The motor controller will send	1								1	1	1										1								
Yes		Use 32-bit hearhed unique ID to assign the CAN ID of the controller. This command is sent to request the current fitmeare version for the motor controller. This command uniquely additionate a device and only the additionated between will respond to this message. The motor controller will send to the sent controller will sent to the sent	1		1 1			1	1		1		1		1			1					l	1				,	This is a duplicate of the coardcast frame in REV	1	
Yes Updated for v1.5.0 Updated for v1.6.0	Firmware Version	formesse version of the order controlled formers version of the order controlled formers of the controlled the controlled formers of the controlled the controlled formers of the controlled the controlled formers of the controlled formers of the controlled the controlled formers of th	2052600	motorController	REV	9	8 0x98	33891840	Individual Device										6	Firmware Version	Firmware Version	Firmware Version	Firmware Version	is debug?	HW Rev (ASCII Char)	Firmware Hash [0]	Firmware Hash [1]	6	opendicast frame in REV address space	0 Byte Request	Firmware Frame
		This command causes the motor controller to send out a response to																													
		indicate that device is present on the CAN network. In order to prevent all	1					1			1		1		1								l								
		devices from responding at once, the motor controllers will wait for (device	1								1	1	1										1								
		number) + 1ms after the enumerate command before responding. Once	1		1 1			1	1		1		1		1			1					l	1						1	
		enumeration has been started, the CAN device that requested the enumeration	1		1 1			1	1		1		1		1			1					l	1						1	
		sequence should wait at least 80ms before generating any other CAN traffic	1								1	1	1										1								
		to avoid affecting the enumeration sequence. After the enumeration	1		1 1			1	1		1		1		1			1					l	1						1	
		sequence is complete, normal CAN activity should resume allowing the	1		1 1			1	1		1		1		1			1					l	1						1	
		motor controllers to keep their CAN links active. The motor controller will	1								1	1	1										1								
		also send out an enumeration message with its ID when it is first started. This	1								1	1	1										1								
		can be used by the CAN controller to detect when new motor controllers	1		1 1			1	1		1		1		1			1					l	1						1	
		become available, and to detect when existing motor controllers are restarted	1									1	1										1								
No	REV Enumerate	because of an intermittent power failure.	2052640	motorController	REV	,	9 0:99	33891904	Individual Device			1	1										1								
	*******	Command from roboRIO which 'locks'				7		23031304							LockTi				Г ,												
		Command from roboRIO which hocks: the device intro noboRIO mode. If this frame is recleved and is valid the device will only accept valid hearthcaft frames from the roboRIO. (Latches the device into tompetition FIV mode or serials), to be set out by the USB bus. Manually set the telement of the ordering of the controller.	1									1	1		LockType (Default = 0 = Lock commands AND heartbeat) 1 = Lock out only heartbeat								1								
		from the roboRIO. (Latches the device	1		1 1			1	1		1		1		commands AND to who	,		1					l	1						1	
1.3.0 and above	entroPIO Lork	Lock type is valid for what is allowed to be set out by the USR has	2052600	motorController	REV		11.0498	33893035	Individual	Ι.	APIRN	APIR1	API(2)	APIN	1 = Lock out	Ί.							l	1						1	
and apply	manaran salek	Manually set the telemetry data of the	2002000	Jorcomoler	m.v	- 1	usato .	33692033	Individual	-	~ 44	~7(1)	~~(4)		usy nearbest	_		<u> </u>						-				\rightarrow			
Yes	Telemetry Update Mechanical Position Enoder Po	Manually set the telemetry data of the or controller Manually set the telemetry data of the controller Manually set the telemetry data of the	2052800	motorController	MEV	10	0 0xA0	33892352	Individual Device		MechPos[0]	MechPos[1]	MechPos(2)	MechPos(3)	+	+	1						-	-				-			-
Yes	Telemetry Update I Accum	controller Manually set the telemetry data of the	2052880	motorController		-	2 0xA2	33892480	Device		(Accum(0)	IAccum[1]	(Accum(2)	Mccum(3)	-	-	1			-			-	-	_		-	-			
1.4.0 and above	Telemetry Update Mechanical Position Analog	Manually set the telemetry data of the controller	20628C0	motorController		10	3 0xA3	33892544	Device		MechPos[0]	MechPos(1)	MechPos(2)	MechPos(3)	_	-															
1.4.0 and above	Telemetry Update Mechanical Position Alt Encode	ar .	2062900	motorController	REV		4 0xA4	33892606	Device																						
	Non-roboRIO Broadcast (not a command)	Not a command, this group is for non- roboRIO useage broadcast commands	2052C00	motorController	REV	11	0 0x80	33893376	Individual Device		Enabled[0]	Enabled[1]	Enghlor(2)	Enabled(3)	Fnahled(4)	Enabled[5]	Enabled(6)	Frahled(7)						1							
INA																															

plemented?	Command Name	Description	extid	Device Type	Manufacturer	API Class API Inde	x API	Mask David	ID Data IN Leng	th Data(0)	Data[1]	Data[2]	Data(3)	Data[4]	Data[5]	Datal61	Data[7]	Data OUT Length	DataOut[0]	DataOut[1]	DataOut(2)	DataOut[3]	DataOut[4]	DataOut[5]	DataOut[6]	DataOut[7]	RTR Frame Length	Clarification Needed?	Data In	Response
30 and above		Command from other processor which looks out USS from sending command or heartheat farmer. This is giprored if INSURINGE of the command of the USS. This is easified selfing a device on the basis that seator. For exemple a Raspberry Pr can lock down the basis and the valve to prevent other devices from commanding SPARK MAX's.		motorController		11	1 0x81	33893440 David	4	8 APIIO	API(1)	API21	APISI	LockType (Default = 0 = Lock commands AND heartheat) 1 = Lock out only heartheat																
1.3.0 and above		Heartbeat command for all REV motor controllers. This is the same as the heartbeat but does not activate the controller if a lock packet has been recieved. This command welds for an additional one second after boot to check for its lock.	2052C80	motorController	REV	11	2 0x82	33893504 Indivi		8 Enabled(0)	Enabled[1]	Enabled(2)	Enabled(3)	Enabled[4]	Enabled[5]	Enabled(6)	Enabled(7)													
1.5.0 and above	USB Only Identify		2052CC0	motorController	REV	11	3 0xB3	33893568 David		0									0											
fes		Set parameter using the CAN ID fields instead of a selection in the packet		motorController		48	0 0x300	33931284 Indivi	al	5 Param(0)	Param(1)	Param(2)	Param[3]	Parameter Type					6 Param(0)	Param(1)	Param(2)	Param(3)	Parameter Type	Parameter Response (0 = response OK)				This API is ord with the parameter ID. Send a 0 data length message and/or send the remote bit to get the value, send data to set it.		