WINGS EV PVT LTD

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Format of CAN Messages to Instrument Cluster v1.7

Source-	**Control MCU**
All Frames Extended type 29-bit ID, 500 KBPS	

Message Type or Contents	Message ID	Byte 1 LS Byte	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7	Byte 8 MS Byte
BASE ID	**0x00FFFF0**								
Charging EM	BASE ID + OFFSET 1	Voltage Low Byte	Voltage High Byte	Current Low Byte	Current High Byte	EnergyWH Low Byte	EnergyWH High Byte	Charge AH Low Byte	Charge AH high Byte
		1 bit = 0.01V		1 bit = 0.01A		1 bit = 0.1WH		1 bit = 0.01 AH	
Discharging EM	BASE ID + OFFSET 2	Voltage Low Byte	Voltage High Byte	Current Low Byte	Current High Byte	EnergyWH Low Byte	EnergyWH High Byte	Charge AH Low Byte	Charge AH high Byte
		1 bit = 0.01V		1 bit = 0.01A		1 bit = 0.1WH		1 bit = 0.01 AH	
Battery Power BMS	BASE ID + OFFSET 3	Voltage Low Byte	Voltage High Byte	Current Low Byte	Current High Byte	EnergyWH Low Byte	EnergyWH High Byte	Charge AH Low Byte	Charge AH high Byte
		1 bit = 0.01V		1 bit = 0.01A; Offset= 10000		1 bit = 0.1WH		1 bit = 0.01 AH	
Battery Cell data BMS	BASE ID + OFFSET 4	Highest Cell Voltage Low Byte	Highest Voltage High Byte	Lowest Cell Voltage Low Byte	Lowest Voltage High Byte	Highest V Cell Number	Loest V Cell Number	Maximum range in Kms	Steering, Brake, throttle, Charger Status Flags
		1 bit = 1 millivolt		1 bit = 1 millivolt		0 to 23	0 to 23	1 bit = 1 km	**See Here -->>**
Battery Status BMS	BASE ID + OFFSET 5	State Of Charge SoC	State Of Health SoH	Time To empty	Estimated Range in Kms	Battery Temp	**Battery Status Flags**	Time To Full Charge (max 255 min)	**Battery Error Flags**
		1 bit = 1 %	1 bit = 1 %	1 bit = 1 min	1 bit = 1 km	1 bit = 1 deg C	**See Here -->>**	1 bit = 1 min	**See Here -->>**
Vehicle State	BASE ID + OFFSET 6	Speed in KMPH Low Byte	Speed in KMPH High Byte	Steering Angle Low Byte	Steering Angle High Byte	Brake Pedal Low Byte	Brake Pedal High Byte	Throttle Pedal Low Byte	Throttle Pedal High Byte
		1 bit = 0.01 kmph		1 bit = 0.1 deg		1 bit = 1 millivolt		1 bit = 1 millivolt	
Motor Controller - Left	BASE ID + OFFSET 7	Left Motor RPM Low Byte	Left Motor RPM HighByte	Left Controller Temp	Left Motor Temp	Left MC Status Flags	Left MC Throttle Signal	Left MC Error code MSB	Left MC Error code LSB
		1 bit = 1 rpm		1 bit = 1 deg C	1 bit = 1 deg C	**See Here -->>**	8-bit number	8-bit number	8-bit number
Motor Controller - Right	BASE ID + OFFSET 8	Right Motor RPM Low Byte	Right Motor RPM HighByte	Right Controller Temp	Right Motor Temp	Right MC Status Flags	Right MC Throttle Signal	Right MC Error code MSB	Right MC Error code LSB
		1 bit = 1 rpm		1 bit = 1 deg C	1 bit = 1 deg C	**See Here -->>**	8-bit number	8-bit number	8-bit number
Source-	**R Pi**								
Time Stamp	BASE ID + OFFSET 9	Time in Hours	Time in Minutes	Time in seconds	Date of Month	Month	4-digit Year LOW BYTE	4-digit Year HIGH BYTE	SPARE
		1 bit = 1 hour	1 bit = 1 minute	1 bit = 1 seconds	1 bit = 1 day	1 bit = 1 month	1 bit = 1 year		0xFF
GPS Data	BASE ID + OFFSET 0xA	Altitude in meters Low Byte	Altitude in meters High Byte	Course in (0 to 359 degrees) LOW BYTE	Course in (0 to 359 degrees) HIGH BYTE	Number of satellites 0 to 24	Speed in KMPH 0 to 255	SPARE	SPARE
		1 bit = 0.1 meter		1 bit = 0.1 degree		1 bit = 1 satellite	1 bit = 1 kmph	0xFE	0xFF
GPS Location	BASE ID + OFFSET 0x0B	Latitude LS Byte	Latitude LS+1 Byte	Latitude LS+2 Byte	Latitude LS+3 or MS Byte	Longitude LS Byte	Longitude LS+1 Byte	Longitude LS+2 Byte	Longitude LS+3 or MS Byte
		4- byte Float				4- byte Float			
Source-	**Control MCU**								
NEW Vehicle Dynamics	BASE ID + OFFSET 0x0C	centrifugal Acceleration LS Byte	centrifugal Acceleration LS+1 Byte	centrifugal Acceleration LS+2 Byte	centrifugal Acceleration LS+3 Byte	Averaged Speed in KMPH Low Byte	Averaged Speed in KMPH High Byte	SPARE	SPARE
						1 bit = 0.01 kmph		0xFE	0xFF
	BASE ID + OFFSET 0x0D								
	BASE ID + OFFSET 0x0E								
	BASE ID + OFFSET 0x0F								
Source-	**Mega with Accelorometer**								
	BASE ID + OFFSET 0x10	Accleleration x-axis LS Byte	Accleleration x-axis LS+1 Byte	Accleleration x-axis LS+2 Byte	Accleleration x-axis LS+3 Byte	Accleleration y-axis LS Byte	Accleleration y-axis LS+1 Byte	Accleleration y-axis LS+2 Byte	Accleleration y-axis LS+3 Byte or MS Byte
	BASE ID + OFFSET 0x11	Accleleration z-axis LS Byte	Accleleration z-axis LS+1 Byte	Accleleration z-axis LS+2 Byte	Accleleration z-axis LS+3 Byte or MS Byte	Yaw LS Byte	Yaw LS+1 Byte	Yaw LS+2 Byte	Yaw LS+3 Byte or MS Byte

VIN 4 bytes

Steering , Brake, throttle, Charger Status Flags

7	6	5	4	3	2	1	0
Brake_Switch	throttle_Switch	charger_plugged	SAS_OK	SAS_CALiBRATED	SAS_TRIM	St_Direction	ECU Warning

Battery Status Flags

7	6	5	4	3	2	1	0
BFL bit 1	BFL bit 0	Charging_cable_connected	Charging_status	BP_Power_loss	BP_ready_status	Charging_Contactor_status	Discharging_Contactor_status

Battery Error Flags

7	6	5	4	3	2	1	0

This value is read from BMS message ID 0x18FF28F4, byte 8 and passed on as it is.

LEFT Motor Controller SwitchStatus

7	6	5	4	3	2	1	0
FOOT_SW	FWD_SW	REV_SW	BRAKE_SW	FB1	FB0	CMD1	CMD0

RIGHT Motor Controller SwitchStatus

7	6	5	4	3	2	1	0
FOOT_SW	FWD_SW	REV_SW	BRAKE_SW	FB1	FB0	CMD1	CMD0

BASE ID + OFFSET 0x12	gyroscope x-axis LS Byte	gyroscope x-axis LS+1 Byte	gyroscope x-axis LS+2 Byte	gyroscope x-axis LS+3 Byte or MS Byte	gyroscope y-axis LS Byte	gyroscope y-axis LS+1 Byte	gyroscope y-axis LS+2 Byte	gyroscope y-axis LS+3 Byte or MS Byte	
BASE ID + OFFSET 0x13	gyroscope z-axis LS Byte	gyroscope z-axis LS+1 Byte	gyroscope z-axis LS+2 Byte	gyroscope z-axis LS+3 Byte or MS Byte	Pitch LS Byte	Pitch LS+1 Byte	Pitch LS+2 Byte	Pitch LS+3 Byte or MS Byte	
BASE ID + OFFSET 0x14	magnetometer x-axis LS Byte	magnetometer x-axis LS+1 Byte	magnetometer x-axis LS+2 Byte	magnetometer x-axis LS+3 Byte or MS Byte	magnetometer y-axis LS Byte	magnetometer y-axis LS+1 Byte	magnetometer y-axis LS+2 Byte	magnetometer y-axis LS+3 Byte or MS Byte	
BASE ID + OFFSET 0x15	magnetometer z-axis LS Byte	magnetometer z-axis LS+1 Byte	magnetometer z-axis LS+2 Byte	magnetometer z-axis LS+3 Byte or MS Byte	Roll LS Byte	Roll LS+1 Byte	Roll LS+2 Byte	Roll LS+3 Byte or MS Byte	
BASE ID + OFFSET 0x16	quaternion x-axis LS Byte	quaternion x-axis LS+1 Byte	quaternion x-axis LS+2 Byte	quaternion x-axis LS+3 Byte or MS Byte	quaternion y-axis LS Byte	quaternion y-axis LS+1 Byte	quaternion y-axis LS+2 Byte	quaternion y-axis LS+2 Byte	
BASE ID + OFFSET 0x17	quaternion z-axis LS Byte	quaternion z-axis LS+1 Byte	quaternion z-axis LS+2 Byte	quaternion z-axis LS+3 Byte or MS Byte	quaternion 0 LS Byte	quaternion 0 LS+1 Byte	quaternion 0 LS+2 Byte	quaternion 0 LS+2 Byte	
BASE ID + OFFSET 0x18	Rate LS Byte	Rate LS+1 Byte	Rate LS+2 Byte	Rate LS+3 Byte or MS Byte	0	0	0	0	

NEW

Message Type or Contents	Message ID	Byte 1 LS Byte	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7	Byte 8 MS Byte
Source-	**Mega with Current sensors**								
BASE ID	**0x02000000**								

BASE ID + OFFSET 0x0000	LMC Current Low Byte	LMC Current High Byte	RMC Current Low Byte	RMC Current High Byte	ACC Current Low Byte	ACC Current High Byte	Charger Current Low Byte	Charger Current High Byte	LMC - Left Motor Controller RMC - Right Motor Controller ACC - AC Compressor Motor Controller
	1 bit = 0.01A; Offset= 10000		1 bit = 0.01A; Offset= 10000		1 bit = 0.01A; Offset= 10000		1 bit = 0.01A; Offset= 10000		
BASE ID + OFFSET 0x0001	12V DC Conv#1 Current Low Byte	12V DC Conv#1 Current High Byte	12V DC Conv#2 Current Low Byte	12V DC Conv#2 Current High Byte	12V DC Conv#3 Current Low Byte	12V DC Conv#3 Current High Byte	xxx Current Low Byte	xxx Current High Byte	LMC - Left Motor Controller RMC - Right Motor Controller ACC - AC Compressor Motor Controller
	1 bit = 0.01A; Offset= 10000		1 bit = 0.01A; Offset= 10000		1 bit = 0.01A; Offset= 10000		1 bit = 0.01A; Offset= 10000		