GENERAL INFORMATION

Joral's J1939 encoder uses the industry standard J1939 CAN Bus interface to function equally as an angular position sensor, RPM sensor and counting encoder. All data is updated and trans mitted through status messages every 50 milliseconds. Various settings can also be sent to the encoder, such as home position, expected RPM rate, and counter reset. Additional attributes include:

- Reliable CAN Bus Interface
- 0 to 360 degrees absolute position
- 1000 counts per rotation
- .32 bit incremental counter
- Adjustable home position
- RPM output

INCREMENTAL & ABSOLUTE POSITION OUTPUT FEATURES

Both incremental and absolute position information is calculated and transmitted in the status message. The status message provides fields for managing the behavior of the encoder.

STATUS DATA (PGN 65450)

Absolute position - a 10 bit value (0.36 degrees per bit) provides the angular position from 1 to 1000 counts that corresponds to an angle between 0 and 359.64 degrees.

CW Rotation - a 2 bit flag indicates the direction of rotation is clockwise.

CCW Rotation - a 2 bit flag indicates the direction of rotation is counter-clockwise

Counter - a 32 bit Counter (1 count per bit) is maintained with 1000 counts being equal to one rotation and where the maximum count is 2,147,483,647 (the counter can be reset through the setting message)

POS Count - a 2 bit flag indicates the Counter's value is negative

NEG Count - a 2 bit flag indicates the Counter's value is negative

RPM - a 10 bit value (3 RPM per bit) provides the results of the most recent RPPM calculation

SETTING DATA (PGN 65451)

Reset Counter - a 2 bit flag to reset the Counter value

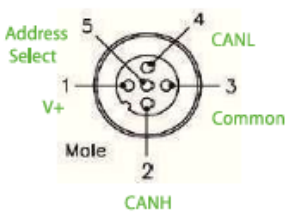
Home/Zero - a 2 bit flag to home (or zero) the Absolute Position value to the current position.

RPM Rate - a 2 bit setting to set the expected RPM rate. This changes the length of time that is used to compute the RPM value.

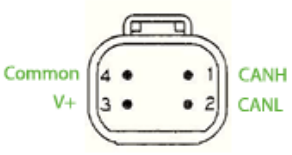
MATING CONNECTOR

Signal	M12 Pin #	Deutsch Pin #
V+	1	3 (red)
CANH	2	1 (yel)
Common	3	4 (blk)
CANL	4	2 (grn)
Address Select (Optional)	5	-

M12



Deutsch DT04-4P



Pin View

J1939 SOURCE ADDRESS

The default source address of the sensor is 210. This can be changed by connecting the proper value resistor from the center pin (pin 5) of the M12 connector to the Common (pin 3). the table to the right shows the resistor values and the corresponding source address. If the resistor value is changed, the device must be power cycled before it uses the new address. Resistor values are compatible with Parker Address Tags 1 to 7 with no termination.

Resistor Value (ohms)	Address
No resistor connected	210
590	211
976	212
1500	213
2260	214
3400	215
5360	216
9530	217

ANALOG VOLTAGE OUTPUT

STATUS MESSAGE	
PGN	65450
Repetition Rate	50 milliseconds
Data Page	0
Priority	4
Source Address	210 (default)
Bit Rate	250K bits / sec
Data Length	8 bytes

		bit 7	bit 6	bit 5	bit 4	bit 3	bit 2	bit 1	bit 0
Data Field	Byte 1	Position							LSB
	Byte 2	CW		CCW		X	X	MSB	
	Byte 3	RPM							LSB
	Byte 4	NEG		POS		X	X	MSB	
	Byte 5	Count							LSB
	Byte 6								
	Byte 7								
	Byte 8	MSB							

Absolute Encoder Position, 10 bits, 0.36 degrees per bit, 0 to 999 (359.65)
CW = 01 means CW rotation | CCW = 01 means CCW rotation
RPM, 10 bits, 3 rpm per bit, 0 to 1000 (3000rpm)
NEG = 01 means count is negative | POS = 01 means count is positive
32 bit Incremental Count, 1000 counts per rotation, 1 count per bit

NOTES:
CW/CCW direction as viewed from face of encoder (from drive magnet
RPM is calculated by running average on 100msec intervals
00 (slow) averages 3 seconds of counts per rpm calculation
01 (medium) averages 1 second of counts per rpm calculation
02 (fast) averages 100 msec of counts per rpm calculation
Count maximum value is 2,147,483,647

SETTING MESSAGE	
PGN	65451
Data Page	0
Priority	X
Source Address	39 (controller)
Bit Rate	250K bits/sec
Data Length	8 bytes

		bit 7	bit 6	bit 5	bit 4	bit 3	bit 2	bit 1	bit 0
Data Field	Byte 1	1	1	RPM		Home		Reset	
	Byte 2	1	1	1	1	1	1	1	1
	Byte 3	1	1	1	1	1	1	1	1
	Byte 4	1	1	1	1	1	1	1	1
	Byte 5	1	1	1	1	1	1	1	1
	Byte 6	1	1	1	1	1	1	1	1
	Byte 7	1	1	1	1	1	1	1	1
	Byte 8	1	1	1	1	1	1	1	1

01 = Reset Counter

01 = Home/Zero Absolute Position

RPM rate, 00=slow, 01=medium, 10=fast

J1939 Encoder Manual Available