33 Boulder Blvd. Stony Plain, AB, T7Z 1V6, Canada
www.cainstruments.com
Ph: 780-963-8930

J1939—MODBus Procon$_{TB}$ With Diagnostic Trouble Codes January, 2017

MODBUS RTU REGISTER MAP

Can access total of 125 successive registers. (1 register = 2 bytes)
Modbus RTU set to 9600,19200,N,8,1,2
NOTE: Registers are initially set to HEX FFFF.
Some PID's occupy two registers. (ie. 247)

Register Address								
1	127	91	92	94	100	102	105	110
9	190	84	168	172	173	174	175	177
17	247	247	XX	183	52	90	98	99
25	109	111	124	XX	101	XX	158	176
33	XX	22	184	185	186	XX	XX	182
41	182	235	235	236	236	244	244	245
49	245	XX	XX	XX	XX	248	248	249
57	249	250	250	XX	XX	XX	Diag. Lamps	Actv TC 1
65	Actv TC 1	Actv TC 2	Actv TC 2	Actv TC 3	Actv TC 3	Actv TC 4	Actv TC 4	Actv TC 5
73	Actv TC 5	Actv TC 6	Actv TC 6	Actv TC 7	Actv TC 7	Actv TC 8	Actv TC 8	Activ TC 9
81	Actv TC 9	Actv TC 10	Actv TC 10	Inactv TC 1	Inactv TC 1	Inactv TC 2	Inactv TC 2	Inactv TC 3
89	Inactv TC 3	Inactv TC 4	Inactv TC 4	Inactv TC 5	Inactv TC 5	Inactv TC 6	Inactv TC 6	Inactv TC 7
97	Inactv TC 7	Inactv TC 8	Inactv TC 8	Inactv TC 9	Inactv TC 9	Inactv TC 10	Inactv TC 10	XX
105	XX	XX	XX	XX	XX	XX	XX	XX
113	XX	XX	XX	XX	XX	XX	XX	XX
121	XX	XX	XX	XX	XX	XX	XX	XX

Sample Modbus RTU Request:	*Sample Slave Response to the Modbus RTU Request:*
To fetch Register 20 to 22 121,03,00,19,00,03,CRC_LO,CRC_HI 121 = Slave Address 03 = Function Code 00 = Starting Address High 19 = Starting Address Low 00 = No. of Registers High 03 = No. of Registers Low	121,03,06,D1,D2,D2,D4,D5,D6,CRC_LO,CRC_HI 121 = Slave Address 03 = Function Code 06 = Byte Count D1 - D6 = Data

PARAMETER I.D. DESCRIPTION

22. Extended Crank Case Blow-By Pressure
Data Length: 1 byte
Resolution: 0.05 kPa/bit
No offset

52. Engine Intercooler Temperature
Data Length: 1 byte
Resolution: 1°C/bit
-40°C offset

84. Wheel Based Vehicle Speed
Data Length: 2 bytes (msb first)
Resolution: 1/256 km/h per bit
No offset

90. Power Takeoff Oil Temperature
Data Length: 1 byte
Resolution: 1°C/bit
-40°C offset

91. Accelerator Pedal Position
Data Length: 1 byte
Resolution: 0.4%/bit
No offset

92. Percent Load at Current Speed
Data Length: 1 byte
Resolution: 1%/bit
No offset

94. Fuel Delivery Pressure
Data Length: 1 byte
Resolution: 4 kPa/bit
No offset

98. Engine Oil Level
Data Length: 1 byte
Resolution: 0.4%/bit
No offset

99. Engine Oil Filter Differential Pressure
Data Length: 1 byte
Resolution: 0.5 kPa/bit
No offset

100. Engine Oil Pressure
Data Length: 1 byte
Resolution: 4 kPa/bit
No offset

101. Crankcase Pressure
Data Length: 2 bytes (msb first)
Resolution: 1/128 kPa/bit
-250 kPa offset

102. Boost Pressure
Data Length: 1 byte
Resolution: 2 kPa/bit
No offset

105. Intake Manifold Temperature
Data Length: 1 byte
Resolution: 1%/bit
-40°C offset

109. Coolant Pressure
Data Length: 1 byte
Resolution: 2kPa/bit
No offset

110. Engine Coolant Temperature
Data Length: 1 byte
Resolution: 1°C/bit
-40°C offset

111. Coolant Level
Data Length: 1 byte
Resolution: 0.4%/bit
No offset

124. Transmission Oil Level
Data Length: 1 byte
Resolution: 0.4%/bit
No offset

127. Transmission Oil Pressure
Data Length: 1 byte
Resolution: 16kPa/bit
No offset

158. Battery Potential (Voltage) – Switched
Data Length: 2 bytes (msb first)
Resolution: 0.05V/bit
No offset

168. Electrical Potential (Voltage)
Data Length: 2 bytes (msb first)
Resolution: 0.05V/bit
No offset

172. Air Inlet Temperature
Data Length: 1 byte
Resolution: 1°C/bit
-40°C offset

173. Exhaust Gas Temperature
Data Length: 2 bytes (msb first)
Resolution: -0.03125°C/bit
-273°C offset

174. Fuel Temperature
Data Length: 1 byte
Resolution: 1°C/bit
-40°C offset

175. Engine Oil Temperature
Data Length: 2 bytes (msb first)
Resolution: -0.03125°C/bit

-273°C offset

176. Turbo Oil Temperature
Data Length: 2 bytes (msb first)
Resolution: -0.03125°C/bit
-273°C offset

177. Transmission Oil Temperature
Data Length: 2 bytes (msb first)
Resolution: -0.03125°C/bit
-273°C offset

182. Trip Fuel
Data Length: 4 bytes (msb first)
Resolution: 0.05L/bit
No offset

183. Fuel Rate
Data Length: 2 bytes (msb first)
Resolution: 0.05L/h per bit
No offset

184. Instantaneous Fuel Economy
Data Length: 2 bytes (msb first)
Resolution: 1/512 km/L per bit
No offset

185. Average Fuel Economy
Data Length: 2 bytes (msb first)
Resolution: 1/512 km/L per bit
No offset

186. Power Takeoff Speed
Data Length: 2 bytes (msb first)
Resolution: 0.125 rpm/bit
No offset

190. Engine Speed
Data Length: 2 bytes (msb first)
Resolution: 0.125 rpm/bit
No offset

235. Total Idle Hours
Data Length: 4 bytes (msb first)
Resolution: 0.05 h/bit
No offset

236. Total Idle Fuel Used
Data Length: 4 bytes (msb first)
Resolution: 0.5L/bit
No offset

244. Trip Distance
Data Length: 4 bytes (msb first)
Resolution: 0.125 km/bit

No offset

245. Total Vehicle Distance
Data Length: 4 bytes (msb first)
Resolution: 0.125 km/bit
No offset

247. Total Engine Hours
Data Length: 4 bytes (msb first)
Resolution: 0.05 h/bit
No offset

248. Total Power Takeoff Hours
Data Length: 4 bytes (msb first)
Resolution: 0.05 h/bit
No offset

249. Total Engine Revolutions
Data Length: 4 bytes (msb first)
Resolution: 1000 r/bit
No offset

250. Total Fuel Used
Data Length: 4 bytes (msb first)
Resolution: 0.5 L/bit
No offset

Diagnostic Lamps
Data Length: 2 bytes (msb first)
Resolution: Bit mapped

Bit 15-14:	Malfunction Indicator Lamp Status
Bit 13-12:	Red Stop Lamp Status
Bit 11-10:	Amber Warning Lamp Status
Bit 9-8:	Protect Lamp Status
Bit 7-6:	Flash Malfunction Indicator Lamp
Bit 5-4:	Flash Red Stop Lamp
Bit 3-2:	Flash Amber Warning Lamp
Bit 1-0:	Flash Protect Lamp

Lamp status definition (bits 15 to 8):

00	Lamp off
01	Lamp on
10	N/A
11	Unavailable

Flash lamp definition (bits 7 to 0):

00	Slow flash (1Hz)
01	Fast flash (2Hz or faster)
10	N/A
11	Unavailable/Do not flash

Trouble Codes (Actv TC and Inactv TC)
Data Length: 4 bytes (msb first)
Resolution: Special

Registers 64 to 83 are allocated to hold up to 10 different active trouble codes simultaneously. Registers 84 to 103 are allocated to hold up to 10 different inactive trouble codes simultaneously.

Trouble code format:

Bit 31-16:	SPN (least significant 2 bytes)
Bit 15-13:	SPN (most significant 3 bits)
Bit 12-8:	FMI
Bit 7-0:	Occurrence count