

APT eMotion

PC Host Software Installation and User Manual



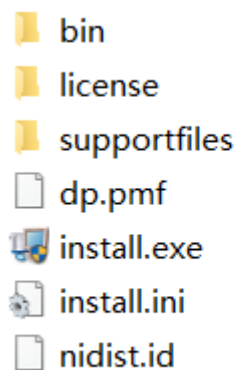
Important Notice

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- Information in this document is subject to change without notice. Corporate and individual names and data used in examples herein are fictitious unless otherwise noted.

- Installation

1. Unzip the compressed file <APT eMotion_customer.rar>



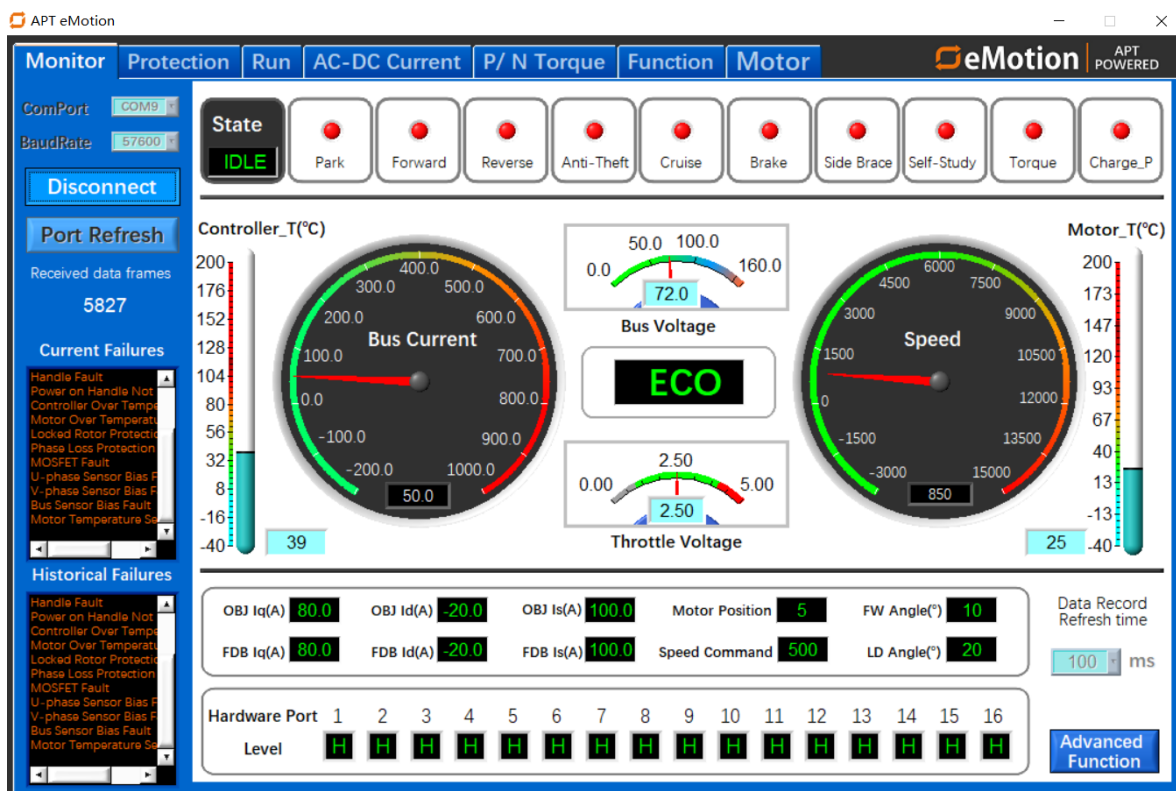
2. Double-click <install.exe>

3. Select the desired storage location, then click <next>

4. Wait for the installation to complete.

• Instructions

- After establishing the hardware communication link between the computer and the controller, open the host computer software.
- Select the correct port number, with the default baud rate set to 57600.
- Click the <Connect> button to establish a connection with the controller; click <Disconnect> to disconnect.
- Display the current status on the home page.
- Example:



Parameters Description

Monitor

1.State: IDLE- Idle status

STARTUP- Parking mode status

PARASET- Parameter setting status

RUN- Running status

STOP- Stopped status

WAIT- Waiting status

FAULT- Fault status

2.The status bar light indicates the current status of the controller.

3. 【Object Iq】 : Q-axis current target value

【Feedback Iq】 :Q-axis current feedback value

【Object Id】 : D-axis current target value

【Feedback Id】 : D-axis current feedback value

【Object Is】 : Phase current target value

【Feedback Is】 : Phase current feedback value

【Motor Position】 : Real-time rotor position of the motor

【Speed Command】 : Target speed for speed control

【Field weak angle】 : The angle between the current vector and the Q-axis

【Lead angle】 : The angle between the current vector and the Q-axis

4.Fault description:

【Hall Fault】 : The motor Hall signal is abnormal, the Hall element fails or the circuit is faulty. It is recommended to repair or replace the components.

【Hardware Over Current】 : The current detected by the hardware circuit is abnormal, and the power circuit may be damaged. It is recommended to power on again or overhaul the controller.

【Phase Over Current】 : The current detected by the software is abnormal, and the power device may be damaged. It is recommended to power on again or overhaul the controller.

【Over Voltage】 : The voltage at the battery input terminal exceeds the set maximum protection value, the control parameters are improperly set or the battery voltage is too high; Solution: Protection - view and modify the overvoltage parameters

【Under Voltage】 : The voltage at the battery input terminal is lower than the set minimum protection value, the control parameters are improperly set or the battery power is low; Solution: Protection - view and modify the undervoltage parameters

【Handle Fault】 : The input signal of the handle is abnormal. It is recommended to check or replace the handle.

【Power On Handle Not Reset】 : For safety protection, the handle must be returned to its original position when power is turned on.

【Controller Over Temperature】 : The temperature of the power device inside the controller is too high and the power usage is too large. It is recommended to cool down before use.

【Motor Over Temperature】 : The internal temperature of the motor is too high and the power used is too large. It is recommended to cool down before use.

【Locked Rotor Protection】 : The load is too large and the motor continues to stall. It is recommended to reduce the load.

【Phase Loss Protection】 : The motor has a single-phase or multi-phase signal missing. It is recommended to check the motor or phase connection.

【MOSFET Fault】 : The MOSFET has failed. It is recommended to replace the controller.

【U-phase Sensor Bias Fault】 : The U-phase signal of the internal current sensor is abnormal. It is recommended to power on again or overhaul the controller.

【V-phase Sensor Bias Fault】 : The V-phase signal of the internal current sensor is abnormal. It is recommended to power on again or overhaul the controller.

【Bus Sensor Bias Fault】 : The DC terminal signal of the internal current sensor is abnormal. It is recommended to power on again or overhaul the controller.

【Motor Temperature Sensor Fault】 : The built-in temperature signal of the motor is abnormal and is not within the reasonable range. It is recommended to repair the motor.

5.Advanced Function

【Start Self-Study】 : Get the motor angle, self-study current, and back electromotive force coefficient

【Data Record】 : Record parameter settings and save to local file

• Parameters Description

• Protection

- 【Rated Voltage(V)】 : Match the rated voltage value set by the battery
- 【Over Voltage Protection(V)】 : The protection voltage value when the battery voltage is detected to be too high and the controller stops working
- 【Over Voltage Recovery(V)】 : Overvoltage protection hysteresis voltage value
- 【Under Voltage Protection(V)】 : The protection voltage value when the battery voltage is detected to be too low and the controller stops working
- 【Under Voltage Recovery(V)】 : Undervoltage protection hysteresis voltage value
- 【Low Voltage Drop Power Point(V)】 : When the battery voltage is insufficient, the voltage point at which power output begins to decrease
- 【Highest Voltage of Reverse Charge(V)】 : Energy recovery voltage, the highest voltage value allowed for charging during reverse charging
- 【Controller Protect Load Shedding(°C)】 : The temperature point at which the temperature of the controller continues to rise, and the power output is reduced
- 【Controller Protect Recovery(°C)】 : The temperature point at which the controller returns to normal and can work
- 【Controller Over-Temperature(°C)】 : The temperature point at which the controller stops working if the controller temperature is too high
- 【Motor Protect Load Shedding(°C)】 : The temperature point at which the motor temperature continues to rise, and the controller reduces the power output
- 【Motor Protect Recovery(°C)】 : The temperature point at which the motor returns to normal and can work
- 【Motor Over-Temperature(°C)】 : The temperature point at which the controller stops working if the motor temperature is too high

• Run

- 【Rated Speed(RPM)】 : Motor speed at rated voltage
- 【Low Speed(RPM)】 : Motor speed when riding in low power mode
- 【Mid Speed(RPM)】 : Motor speed when riding in mid power mode
- 【High Speed(RPM)】 : Motor speed when riding in high power mode
- 【Min Recover Speed(RPM)】 : Minimum speed when reverse charging takes effect
- 【Max Recover Speed(RPM)】 : Maximum speed when reverse charging takes effect
- 【Max Bus Current(A)】 : Controller DC limit value
- 【Max Phase Current(A)】 : Controller phase current limit value
- 【Max Field Weak Current(A)】 : Controller field weakening controls maximum current
- 【Brake Recover Bus Current(A)】 : Reverse charging bus current limit during braking
- 【Glide Recover Bus Current(A)】 : Reverse charging bus current limit when gliding after releasing the throttle
- 【Recover Phase Current(A)】 : Reverse charging phase current limit value
- 【Bus Current Low Power Mode(%)】 : Low-range controller DC limit value percentage
- 【Bus Current Mid Power Mode(%)】 : Mid-range controller DC limit value percentage
- 【Bus Current High Power Mode(%)】 : High-range controller DC limit value percentage
- 【Phase Current Low Power Mode(%)】 : Low-range motor maximum phase current limit percentage
- 【Phase Current Mid Power Mode(%)】 : Mid-range motor maximum phase current limit percentage
- 【Phase Current High Power Mode(%)】 : High-range motor maximum phase current limit percentage

Parameters Description

AC-DC Current

Current loop parameters, default values

Positive/Negative Torque

Reverse and forward phase current. Change the riding experience by adjusting the current percentage at different speeds.

Function

【Phase Meter(%)】 【Pulse Meter(%)】 【One-wire Meter(%)】 【CANBUS Meter(%)】 : Adjust speed ratio

【Throttle low threshold(V)】 : Throttle output voltage starting value when the controller starts working

【Throttle Median(V)】 : Used to adjust acceleration linearity and riding comfort

【Throttle high threshold(V)】 : The maximum value of the throttle output voltage when the controller starts working

【Throttle middle ratio(%)】 : Used to adjust acceleration linearity and riding comfort

【Default】 : Low speed/medium speed/high speed selection

【Mode】 : Inc、Dec/Jog/Toggle selection

【Forward Acc】 : Set the riding experience during forward acceleration

【Forward Dec】 : Set the riding experience during forward deceleration

【Reverse Acc】 : Set the riding experience when accelerating in reverse

【Reverse Dec】 : Set the riding experience when decelerating in reverse

【Recover Acc】 : Set the riding experience when accelerating in recover

【Recover Dec】 : Set the riding experience when decelerating in recover

【Speed Kp】 : Speed loop Kp

【Speed Ki】 : Speed loop Ki

【Anti-slip Speed】 : Slope speed

【Anti-slip Kp】 : Speed loop Kp

【Anti-slip Ki】 : Speed loop Ki

Motor

【Number of Pole Pairs】 : Number of magnetic poles / 2

【Forward Angle Offset】 : Obtained through self-study

【Reverse Angle Offset】 : Obtained through self-study

【Hall Connection】 : Change the phase sequence and switch the motor running direction

【Phase Connection】 : Change the phase sequence and switch the motor running direction

【Self-Study Current】 : Motor angle learning setting current, obtained through self-study

【Back EMF Coefficient】 : Obtained through self-study