APPENDIX

```
76.     #include <Servo.h>
77.     #include <Ethernet.h>
78.     #include <PubSubClient.h>
79.     #include <SPI.h>
80.
81.     byte mac[]    = {  0xDE, 0xED, 0xBA, 0xFE, 0xFE, 0xED };
82.     IPAddress ip(192, 168, 41, 12);
83.     IPAddress gateway(192, 168, 41, 1);
84.     IPAddress server(103, 243, 177, 130);
85.
86.     int servo_speed = 25;
87.     const int buttonputar = 2;
88.     const int buttonAngkat = 3;
89.     const int buttonTurun = 4;
90.     const int GripCengkram = 5;
91.     const int GripLepas = 6;
92.     int buttonState = 0;
93.     Servo servobase;
94.     Servo servoA;
95.     Servo servoB;
96.     Servo grip1;
97.     Servo grip2;
98.     int pos = 0;
99.     int potpin = 0;
100.    int val;
101.    int pirPin = 12;
102.    int counter = 0;
103.    int state;
104.    int laststate = HIGH;
105.
106.    void callback(char* topic, byte* payload, unsigned int
  length) {
107.      Serial.print("Message arrived [");
108.      Serial.print(topic);
109.      Serial.print("] ");
110.    }
111.
112.    EthernetClient ethClient;
113.    PubSubClient client(ethClient);
114.    unsigned long readTime;
115.    unsigned long message;
116.
117.    void reconnect() {
118.      // Loop until we're reconnected
119.      while (!client.connected()) {
120.        Serial.print("Attempting MQTT connection...");
121.        if (client.connect("arduinoClient","hendi","1234")) {
122.          Serial.println("connected");
123.        } else {
```

```
124.          Serial.print("failed, rc=");
125.          Serial.print(client.state());
126.          Serial.println(" try again in 1 seconds");
127.          delay(1000);
128.        }
129.      }
130.    }
131.
132.    void setup()
133.    {
134.      Serial.begin (9600);
135.       Ethernet.begin(mac, ip, gateway, server);
136.     Serial.print("IP = ");
137.     Serial.println(Ethernet.localIP());
138.     client.setServer(server, 1883);
139.     client.setCallback(callback);
140.     Ethernet.begin(mac, ip);
141.     delay(1500);
142.      pinMode(buttonputar, INPUT);
143.      pinMode(buttonAngkat, INPUT);
144.      pinMode(buttonTurun, INPUT);
145.      pinMode(GripCengkram, INPUT);
146.      pinMode(GripLepas, INPUT);
147.      servobase.attach(7);
148.      servoA.attach(8);
149.      servoB.attach(9);
150.      grip1.attach(10);
151.      grip2.attach(11);
152.      pinMode(pirPin, INPUT);
153.    }
154.
155.    void loop() {
156.      if (!client.connected())
157.        {
158.        reconnect();
159.        }
160.        client.loop();
161.      buttonState = digitalRead(buttonputar);
162.      if ( buttonState == HIGH) {
163.        val = analogRead(potpin);
164.       val = map(val, 0, 60, 0, 60);
165.        servobase.write(val);
166.       delay(servo_speed);
167.        servobase.detach();
168.      Serial.println("Tombol Putar Telah ditekan");
169.     }
170.
171.      buttonState = digitalRead(buttonAngkat);
172.      if ( buttonState == HIGH) {
173.        servoA.write(40);
174.        servoB.write(20);
175.        delay(servo_speed);
176.       // Serial.println("Tombol Telah ditekan");
177.        //Serial.println("servo bergerak naik");
```

```
178.       }
179.
180.       buttonState = digitalRead(buttonTurun);
181.       if ( buttonState == HIGH) {
182.         servoA.write(90);
183.         servoB.write(150);
184.         delay(servo_speed);
185.         Serial.println("Tombol Telah ditekan");
186.         Serial.println("servo bergerak turun");
187.       }
188.
189.       buttonState = digitalRead(GripCengkram);
190.       if ( buttonState == HIGH) {
191.         grip1.write(0);
192.         grip2.write(180);
193.         delay(servo_speed);
194.         Serial.println("Tombol Telah ditekan");
195.         Serial.println("servo bergerak mengambil");
196.       }
197.
198.       buttonState = digitalRead(GripLepas);
199.       if ( buttonState == HIGH) {
200.         grip1.write(180);
201.         grip2.write(0);
202.         delay(servo_speed);
203.         Serial.println("Tombol Telah ditekan");
204.         Serial.println("servo bergerak lepas");
205.       }
206.
207.       int state = digitalRead(pirPin);
208.            if ( state != laststate) {
209.            counter=counter+1;
210.            Serial.println("Barang yang dipindahkan =   ");
211.            Serial.println(counter);
212.            }
213.            laststate = state;
214.            delay(0);
215.         {
216.         sensorRead();
217.         delay(1000);
218.         }
219.     }
220.
221.     void sensorRead(){
222.       char buffer[10];
223.       dtostrf(counter,0, 0, buffer);
224.       client.publish("/970149/counter",buffer);
225.
226.     }
227.
```

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