

MODUL
ARDUINO ETHERNET SHIELD (4)
Web Client, PHP, MySQL

PRAKTIKUM

1. Pada praktikum ini data suhu dari Arduino UNO (A0) akan dikirimkan ke server, disimpan di database dan ditampilkan via web browser.
2. Menyiapkan database. MySQL table
 - Unique ID (int),
 - Event date and time (timestamp),
 - Sensor serial number (varchar),
 - Temperature dalam Celsius (varchar).

Query:

```
CREATE TABLE `test`.`temperature` (  
  
  `id` INT NOT NULL AUTO_INCREMENT PRIMARY KEY COMMENT 'unique ID',  
  `event` TIMESTAMP NOT NULL DEFAULT CURRENT_TIMESTAMP COMMENT 'Event Date and Time',  
  `sensor` VARCHAR( 30 ) NOT NULL COMMENT 'Unique ID of the sensor',  
  `celsius` VARCHAR( 10 ) NOT NULL COMMENT 'Measured Temperature in Celsius',  
  INDEX ( `event` , `sensor` )  
  ) ENGINE = InnoDB;
```

3. Buat **dbconnect.php**

```
<?php  
$MyUsername = "your username"; // enter your username for mysql  
$MyPassword = "your password"; // enter your password for mysql  
$MyHostname = "localhost"; // this is usually "localhost" unless your  
database resides on a different server  
  
$dbh = mysql_pconnect($MyHostname , $MyUsername, $MyPassword);  
$selected = mysql_select_db("test",$dbh);  
?>
```

4. Buat **review_data.php**

```
<?php  
  // Start MySQL Connection  
  include('dbconnect.php');  
?>  
  
<html>  
<head>
```

```

<title>Arduino Temperature Log</title>
<style type="text/css">
    .table_titles, .table_cells_odd, .table_cells_even {
        padding-right: 20px;
        padding-left: 20px;
        color: #000;
    }
    .table_titles {
        color: #FFF;
        background-color: #666;
    }
    .table_cells_odd {
        background-color: #CCC;
    }
    .table_cells_even {
        background-color: #FAFAFA;
    }
    table {
        border: 2px solid #333;
    }
    body { font-family: "Trebuchet MS", Arial; }
</style>
</head>

<body>
    <h1>Arduino Temperature Log</h1>
    <table border="0" cellspacing="0" cellpadding="4">
        <tr>
            <td class="table_titles">ID</td>
            <td class="table_titles">Date and Time</td>
            <td class="table_titles">Sensor Serial</td>
            <td class="table_titles">Temperature in Celsius</td>
        </tr>
<?php
    // Retrieve all records and display them
    $result = mysql_query("SELECT * FROM temperature ORDER BY id ASC");

    // Used for row color toggle
    $oddrow = true;

    // process every record
    while( $row = mysql_fetch_array($result) )
    {
        if ($oddrow)
        {
            $css_class=' class="table_cells_odd"';
        }
        else
        {
            $css_class=' class="table_cells_even"';
        }

        $oddrow = !$oddrow;

        echo '<tr>';

```

```

        echo ' <td'. $css_class.'>' . $row["id"] . '</td>';
        echo ' <td'. $css_class.'>' . $row["event"] . '</td>';
        echo ' <td'. $css_class.'>' . $row["sensor"] . '</td>';
        echo ' <td'. $css_class.'>' . $row["celsius"] . '</td>';
        echo '</tr>';
    }
?>
</table>
</body>
</html>

```

5. Buat `add_data.php`

```

<?php
    // Connect to MySQL
    include("dbconnect.php");

    // Prepare the SQL statement
    $SQL = "INSERT INTO test.temperature (sensor ,celsius) VALUES
    (". $_GET["serial"].", " . $_GET["temperature"].")";

    // Execute SQL statement
    mysql_query($SQL);

    // Go to the review_data.php (optional)
    header("Location: review_data.php");
?>

```

6. Source Code

```

#include<Ethernet.h>
#include<SPI.h>
const int temperaturePin = A0;
// **** ETHERNET SETTING ****
// Arduino Uno pins: 10 = CS, 11 = MOSI, 12 = MISO, 13 = SCK
// Ethernet MAC address - must be unique on your network - MAC Reads T4A001 in hex
// (unique in your network)
byte mac[] = { 0x90, 0xA2, 0xDA, 0x0F, 0x3A, 0xDC };
// For the rest we use DHCP (IP address and such)
IPAddress ip(192,168,2,8);
EthernetClient client;
IPAddress server(192,168,2,9); // IP Adres (or name) of server to dump data to
int interval = 5000; // Wait between dumps

void setup() {

    Serial.begin(9600);
    while (!Serial) {
        ; // wait for serial port to connect. Needed for Leonardo only
    }
    if (Ethernet.begin(mac) == 0) {
        Serial.println("Failed to configure Ethernet using DHCP");
        // no point in carrying on, so do nothing forevermore:

```

```

// try to configure using IP address instead of DHCP:
Ethernet.begin(mac, ip);
}

Serial.println("Tweaking4All.com - Temperature Drone - v2.0");
Serial.println("-----\n");
Serial.print("IP Address      : ");
Serial.println(Ethernet.localIP());
Serial.print("Subnet Mask      : ");
Serial.println(Ethernet.subnetMask());
Serial.print("Default Gateway IP: ");
Serial.println(Ethernet.gatewayIP());
Serial.print("DNS Server IP   : ");
Serial.println(Ethernet.dnsServerIP());
}

void loop() {
// if you get a connection, report back via serial:
if (client.connect(server, 80)) {
    float tem = getTemp();
    Serial.println( tem );
    Serial.println("-> Connected");
    if(client.connected){
// Make a HTTP request:
client.print( "GET /add_data.php?" );
client.print("serial=");
client.print( "TempSensor" );
client.print("&&");
client.print("temperature=");
client.print( tem );
client.println( " HTTP/1.1" );
client.println( "Host: 192.168.2.9" );
//client.println(server);
client.println( "Connection: close" );
client.println();
client.println();
client.stop();
}
}
else {
// you didn't get a connection to the server:
Serial.println("-> connection failed/n");
}

delay(interval);
}

float getTemp() {
float voltage, V,t ;
voltage = analogRead(temperaturePin) ;
V = voltage * 0.004882814 ;
t = (V - 0.5) * 100.0;
}

```

```
    return t;  
}
```

7. Preview

Arduino Temperature Log

ID	Date and Time	Sensor Serial	Temperature in Celsius
7	2014-03-26 11:02:38	288884820500006X	12.3
8	2014-03-26 11:02:44	288884820500006X	12.3
9	2014-03-26 11:02:49	288884820500006X	12.3
10	2014-03-26 11:02:55	288884820500006X	12.3