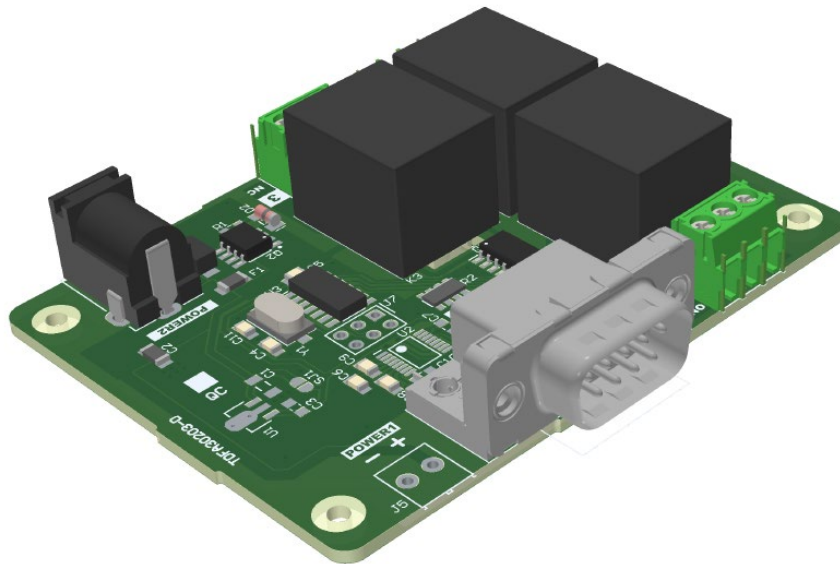# TDFA30203

**RS232C Serial Relay Controller, 3 Form C , 6A 250VAC 28VDC max.**

Revision 1.0



The TDFA30203 is an RS232C serial communication relay control board with three contacts.

**IMPORTANT NOTICE**

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# 1. Specifications

| Item | Value | Description |
|---|---|---|
| Contact Type | SPDT / 1c | |
| Number of Contacts | 3 | |
| Contact Capacity | 6A @ 250VAC / 28VDC | |
| Contact Terminal | AWG 26-16 / 0.2-1.5 $mm^2$  M2 Screw | Phoenix Contact 1984620 |
| Comm. Standard | RS232C | |
| RS232C Parameters | 9600bps, 1 Stop bit, 8 data bits, no flow control, no parity | |
| RS232C Connector | DE-9 (D-Sub 9 Pin) Male  Mounting Screw: Female - Imperial | Use a straight-through cable to connect to the PC |
| Power Supply | TDFA30203-12V    12V (Max Input Rating: 14V)  TDFA30203-24V    24V (Max Input Rating: 26V) | |
| Power Supply (Terminal) | AWG 26-16 / 0.2-1.5 $mm^2$  M2 Screw | Phoenix Contact 1984617 |
| Power Supply (DC Jack) | Inner diam. 2.1mm Outer diam. 5.5mm  Center Positive | |
| Current Consumption | TDFA30230-12V    110 mA max.  TDFA30203-24V    TBD mA max. | All 3 Contacts ON |
| Operating Temperature Range | -10〜50℃ | |
| Weight | TBD g | |
| Dimensions | W:68 D:80 H:20 mm max. | |
| Mounting Holes | Φ2.5mm　(M2, M2.3 ×4) | |

## 2. PCB Layout

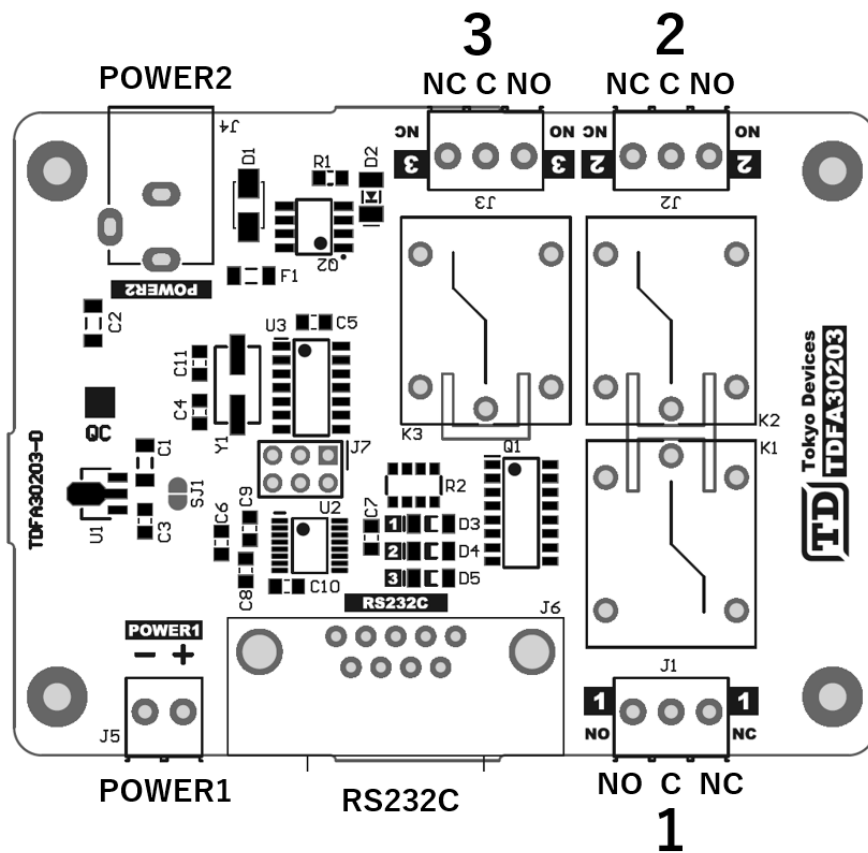The PCB layout and interface specifications are shown in Figure 1 and Table 1.



**Figure 1 PCB Layout**

**Table 1 Interface Specifications**

| Label | Description |
|---|---|
| 1 | Relay 1 contact terminal. When the relay is off, the C terminal connects with the NC terminal; when on, the C terminal connects with the NO terminal. |
| 2 | Relay 2 contact terminal. When the relay is off, the C terminal connects with the NC terminal; when on, the C terminal connects with the NO terminal. |
| 3 | Relay 3 contact terminal. When the relay is off, the C terminal connects with the NC terminal; when on, the C terminal connects with the NO terminal. |
| RS232C | Communication D-Sub 9-pin connector. Connects to communication hosts like PCs and PLCs. |
| POWER1 | Power input terminal. Connects to a DC power supply. |
| POWER2 | Power input DC jack. Connects to an AC adapter. If both POWER1 and POWER2 receive power simultaneously, only POWER2 will be active while POWER1 will be disconnected. |

## 3.　Quick Start Guide

- Connect the power supply to either POWER1 or POWER2 (12V for TDFA30203-12V or 24V for TDFA30203-24V).
- Connect the RS232C port to a computer.

**For Windows (GUI):**

- Search for "TDFA30203" on the Tokyo Devices website, download and install the TD-AppKit software.
- Launch TD-AppKit, go to Device Menu → Open Menu → Select TDFA30203 from the Product Model box → Choose the connected COM port from Detected devices/ports → Click the Open button.
- The application will start. Clicking on the lightbulb icons for Contacts 1-3 toggles the corresponding contacts on and off.
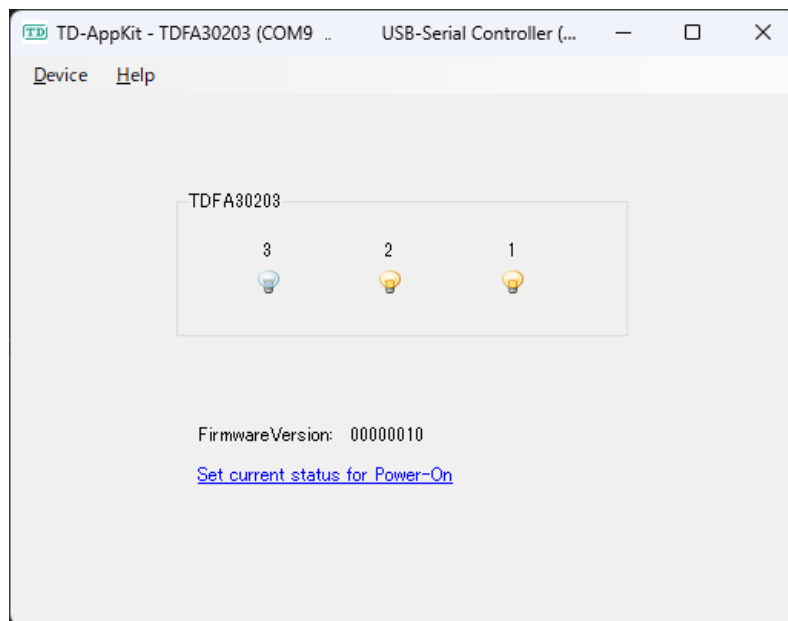


**Figure 2 TD-AppKit Screen Example**

**For Linux or a terminal:**

- Set the communication parameters to 9600 bps, 1 stop bit, 8 data bits, no parity, and no flow control.
- Send `SF000000001` followed by a newline character (¥n) to the COM port. Verify that Contact 1 is switched on.

## 4.　Control Method

This product is controlled via serial communication using text mode. The communication consists of "commands" and "replies." Commands are instructions sent from the host PC to the product, and replies are responses sent from the product to the host. Both commands and replies are strings separated by newline characters (¥n).

### 4.1.　Device Register Specifications

Device registers are values that determine the operation, status, and settings of the product. Each register has a 1-byte address and a 32-bit value. The product is controlled by reading and writing to the registers via serial communication. The device registers of the product are listed in Table 2:

**表 2 TDFA30203 Device Registers**

| Address (HEX) | Name | Description |
|---|---|---|
| 02h | POWERON_PORT_STATUS | Sets the status of each contact at power-on. The values follow the same specification as PORT_STATUS. Changes to this register must be saved in the device's flash memory using the P command. |
| F0h | PORT_STATUS | The lower 3 bits represent the current on/off status of contacts 1-3. Setting a bit turns the corresponding contact on. |
| F2h | FIRMWARE_VERSION | Numeric value representing the firmware version. Read-only. |

## 4.2. Retrieving Device Register Values (G Command and V Reply)

```
G02
V0200000001
```

The command starting with the letter "G" and followed by two characters is a command to read a value from a device register. The two characters after "G" represent the device register's address as a two-digit hexadecimal string (uppercase). Addresses can range from 00 to FF. In the above example, a command is sent to read a value from register 02h.

The reply starts with the letter "V" and is followed by 10 characters. The first two characters represent the address of the register read, while the remaining eight characters represent the value of the register as an 8-digit uppercase hexadecimal string. Since the register is 32-bit, it can take any value from 00000000h to FFFFFFFFh. In the above example, the value 00000001h is obtained from register 02h.

## 4.3. Setting Values in Device Registers (S Command)

The command starting with the letter "S" and followed by 10 characters is a command to write a value to a device register. The two characters after "S" represent the device register's address as a two-digit uppercase hexadecimal string. The following eight characters represent the value to write, as an 8-digit uppercase hexadecimal string. Both the address and value cannot omit leading zeros and must be fully specified as 2 and 8 characters, respectively.

The following example writes the value 3h to the register with address F0h:

```
SF000000003
.
```

The reply is a dot character ".".

## 4.4. Saving Device Register Values (P Command)

Some device registers can be stored in the device's flash memory, allowing their values to be retained even when the power is off. To save these values to flash memory, send the command "P".

```
P
.
```

The reply is a dot character ".". If not saved to flash memory, the changes will only be effective while the power is on, and will be lost upon the next power cycle.

## 4.5. Error Specifications

If an unrecognized command, incorrect case, or invalid value is sent, a question mark "?" will be returned as the reply.

## 5. Product Customization Services

Tokyo Devices offers customization of circuit board exteriors, functionalities, and performance based on customer needs. For more details, please check the "Customization" on the Tokyo Devices website.