ACM38U-Y
Reader Module

User Manual V1.01

Table of Contents

List of Figures

1.0. Introduction

ACM38U-Y provides a solution for secured access control by employing the globally recognized ACR38 core. It comes in module form to enable easy implementation of smart card-based solutions in embedded systems. ACM38U-Y utilizes the latest microchip technology, bringing you high security for your confidential files in a convenient and easy way. ACM38U-Y comes in two variations: CCID and non-CCID.

This document provides the use and configuration of the various connectors of the ACM38U-Y to maximize its convenience and adaptability into diverse embedded environment.

2.0. Configuring the LED operation status

2.1. For ACM38U-Y3 (CCID)

There are two LEDs on ACM38U-Y3 to display its operation status:

- **Red** is for power

- **Green** is for smart card operation

Figure 1: ACM38U-Y3 LED Configuration

2.1.1. Enable LED for smart card operation status

To enable the LED for smart card operation status (see D2), connect a jumper to **J5** (see **Figure 1**).

2.1.2. Enable LED for power status

To enable the LED for power status (see D3), connect a jumper to **J6** (see **Figure 1**).

2.1.3. LED Behaviors

The table below shows the behaviors of the LED during card polling.

LED Color	Behavior	Status
Red	On	Power
Green	Slow flash*	No card present/ Card power off
	On	Card power on
	Fast flash	Card operation

Note: Slow flash means LED turns on for 200 ms every 2 seconds.

2.2. For ACM38U-Y6 (Non-CCID)

There are two LEDs on ACM38U-Y6 to display its operation status:

- **Red** is for power
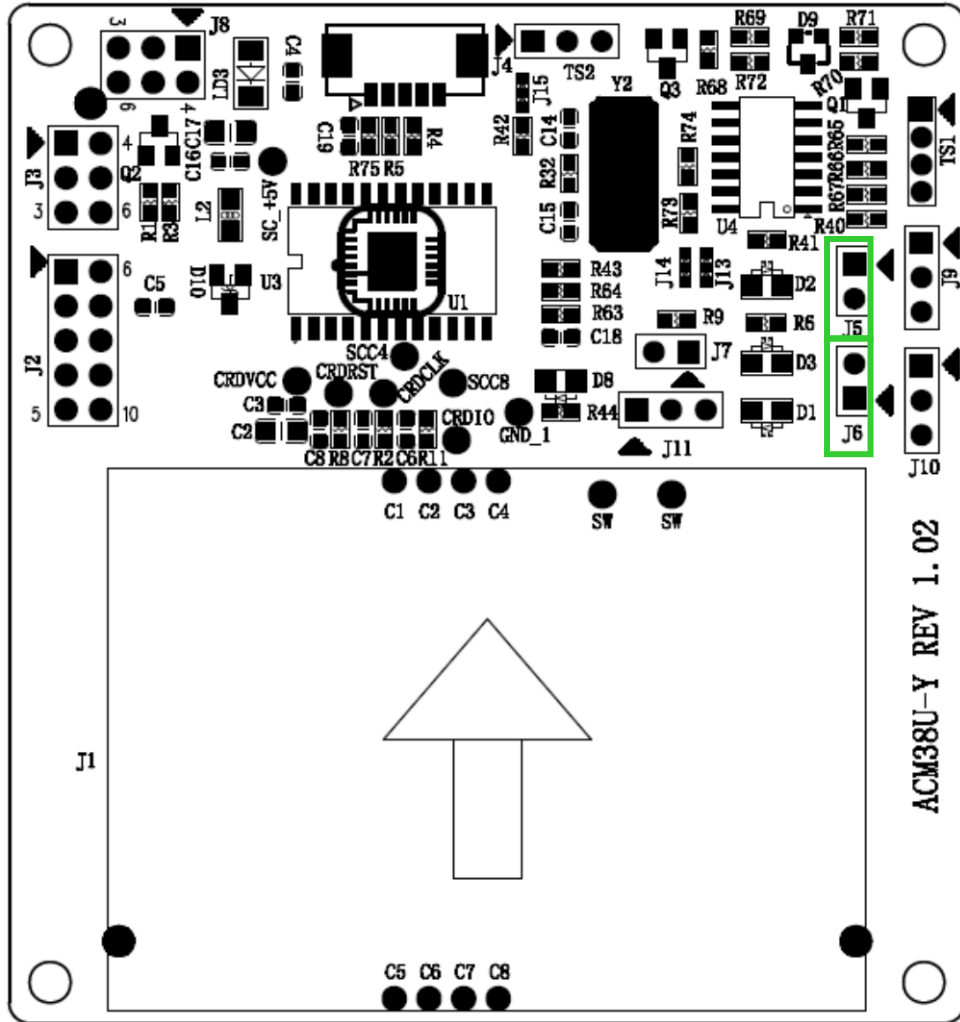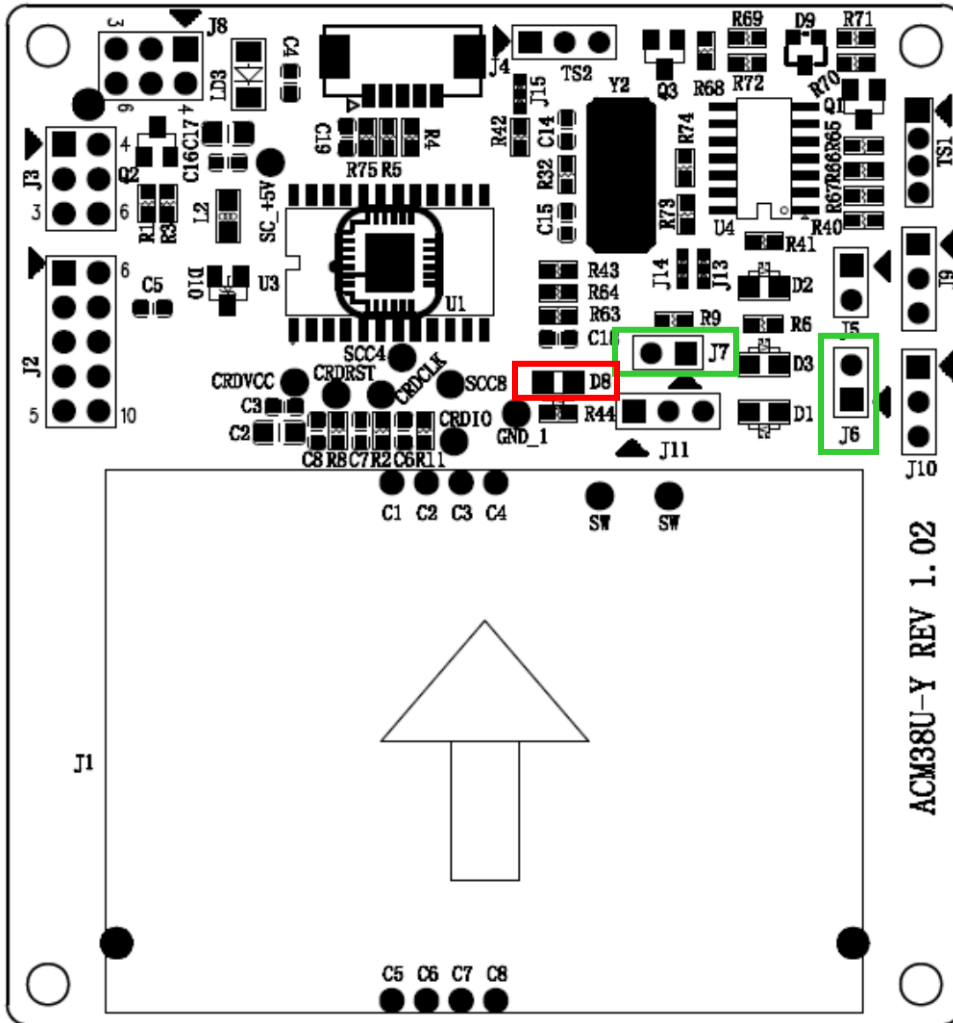
- **Green** is for smart card operation

Figure 2: ACM38U-Y6 LED Configuration

2.2.1. Enable LED for smart card operation

To enable the LED for smart card operation status (D1), connect a jumper to **J7** (see **Figure 2**).

2.2.2. Enable LED for power status

To enable the LED for power status (D3), connect a jumper to **J6** (see **Figure 2**).

2.2.3. LED Behaviors

The table below shows the behavior of the LED during card polling.

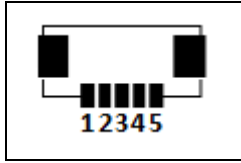| LED Color	Behavior	Status
Red	On	Power
Green	Off	Card power off
	On	Card power on

- SAM card LED (**D8**), will light up when there is a communication between the ACM38U-Y6 and the SAM card.

- The LED status of D1 and D3 are also extendable via J11 and J10 respectively.

3.0. Connect ACM38U-Y to another device via USB

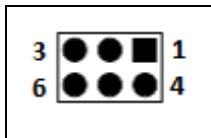A USB port is available to connect the ACM38U-Y module to another device.

To do this:

Option 1: Connect socket (J4) via USB cable to another peripheral device (see **Figure 3**).

1 USB VCC

2 USB D-

3 USB D+

4 USB GND

5 USB shielding

Option 2: Connect jumper (J8) via USB pinout to another peripheral device (see **Figure 3**).

1, **3**, **4** USB GND

2 USB D+

5 USB D-

6 USB VCC

Note: Do not connect both J4 and J8 at the same time as it may cause an abnormal behavior.
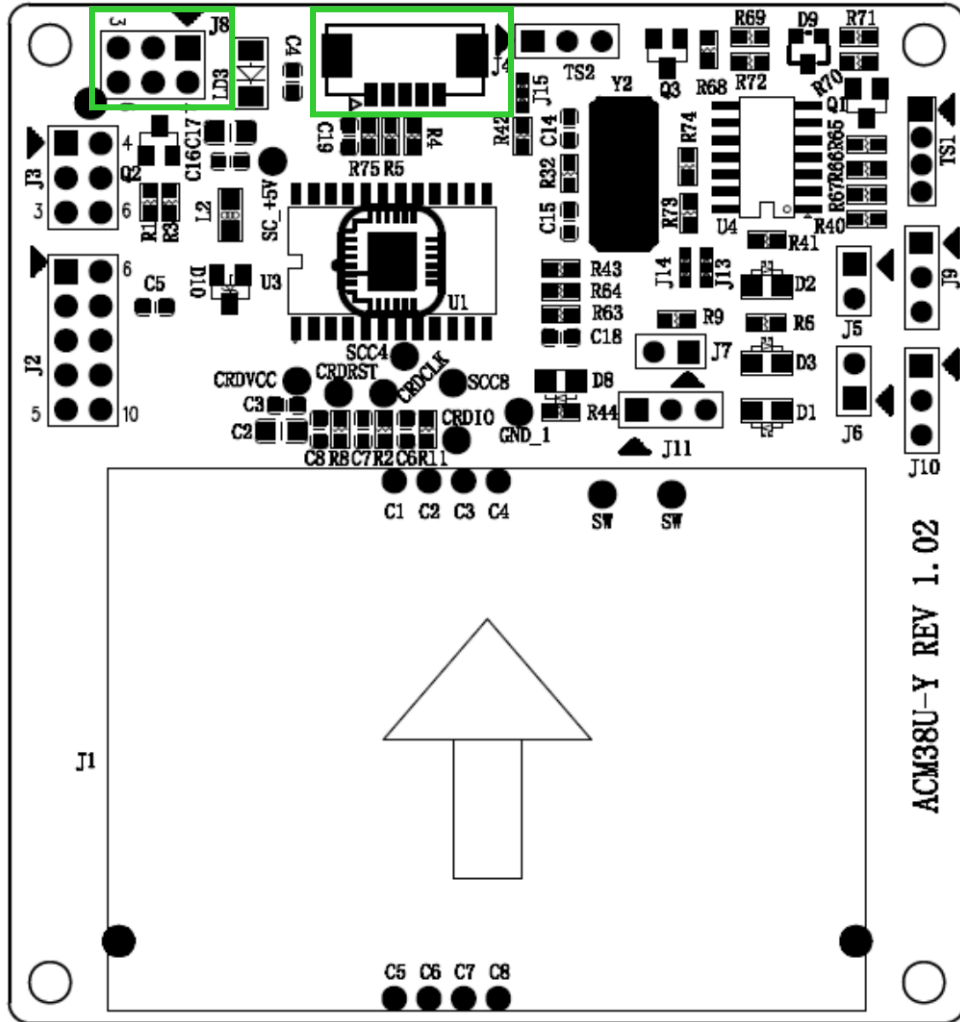
Figure 3: ACM38U-Y USB Configuration

4.0. Configure card detection

There are two types of card detection:

- Normal Open
- Normal Close

Since ACM38U-Y offers extendable smart card connector signal, you can choose the type of card detection to be used in the other end of the device.

To choose a type of card detection:

1. Connect a jumper in (**J3**).

    Note: *This setting is dedicated for extended smart card connector. By default, the ACM38U-Y card connector is Normal Open.*

    The table below shows the two types of card detection and their corresponding jumper connections.

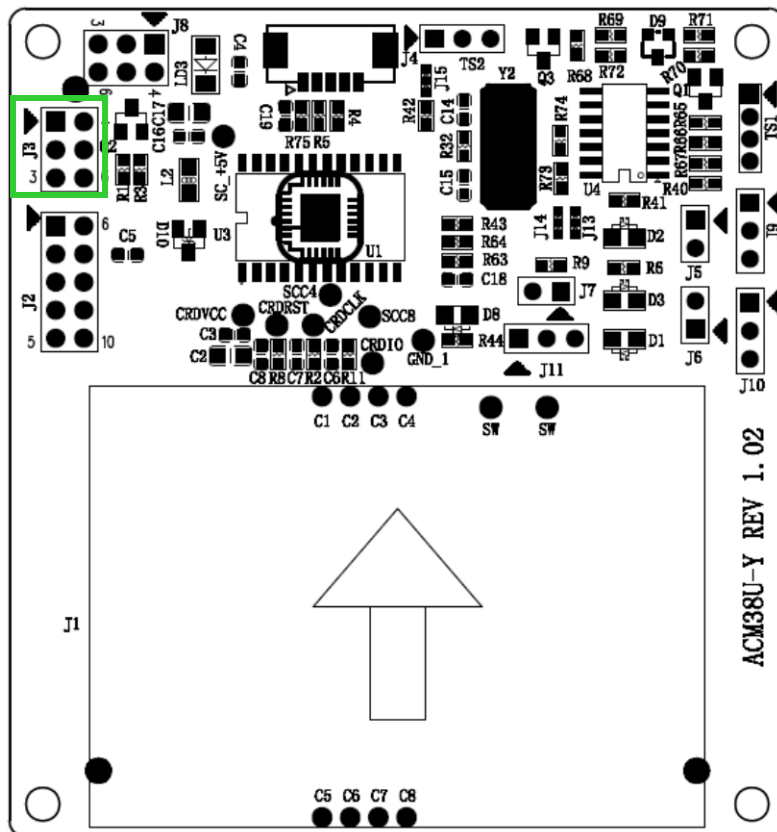| Configuration	Connecting diagram	Descriptions
Normal open card detection circuit		Connect the two pins (as shown in red) for normal open card detection
Normal closed card detection circuit		Connect the two pair of pins (as shown in red) for normal close card detection.

Figure 4: ACM38U-Y Card Detection Configuration
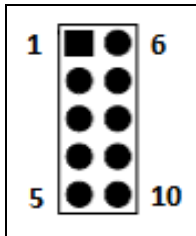
5.0. Configure extended card connector

The ACM38U-Y is designed to offer extendable smart card connector signal that will best fit the embedded system. ACM38U-Y may be connected to another device that is equipped with smart card connector to interface with the smart card.

Notes:

1. *Normal open or normal close should be set if extended smart card connector is being used.*

2. *The extended card connector and on-board card connector cannot be used at the same time.*

To extend the smart card connector signal to other peripheral:

1. Connect a jumper to (**J2**).

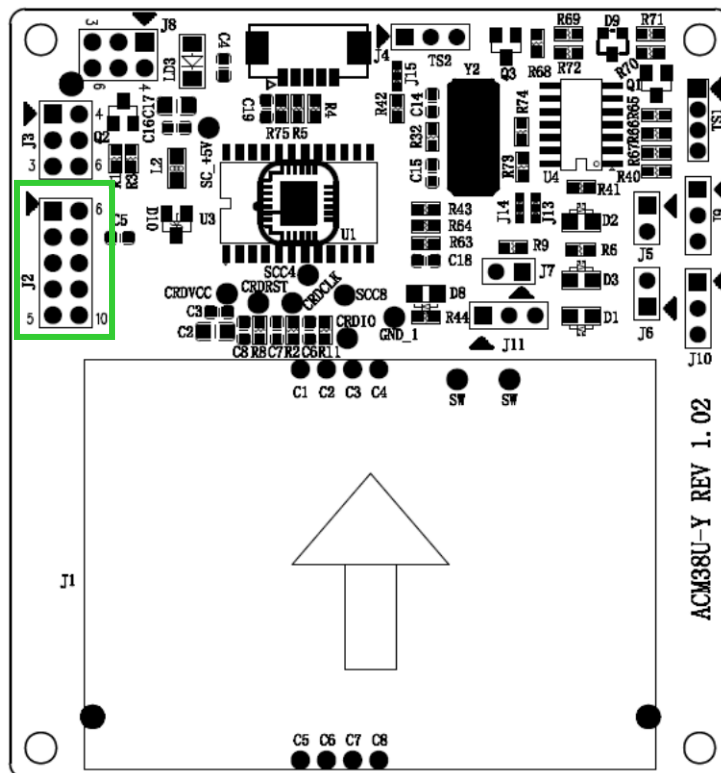|			
1	GND	**6**	Card detection pin
2	GND (C5)	**7**	Card VCC (C1)
3	NC (C6)	**8**	Card reset pin (C2)
4	Card I/O (Data input/output) (C7)	**9**	Card clock signal (C3)
5	Card contact (C8)	**10**	Card contact (C4)

Figure 5: ACM38U-Y Extended Card Connector Configuration

To use the external card connector, selection resistor jumper should be changed. The resistor array should be soldered on (**R14**) instead of R15.
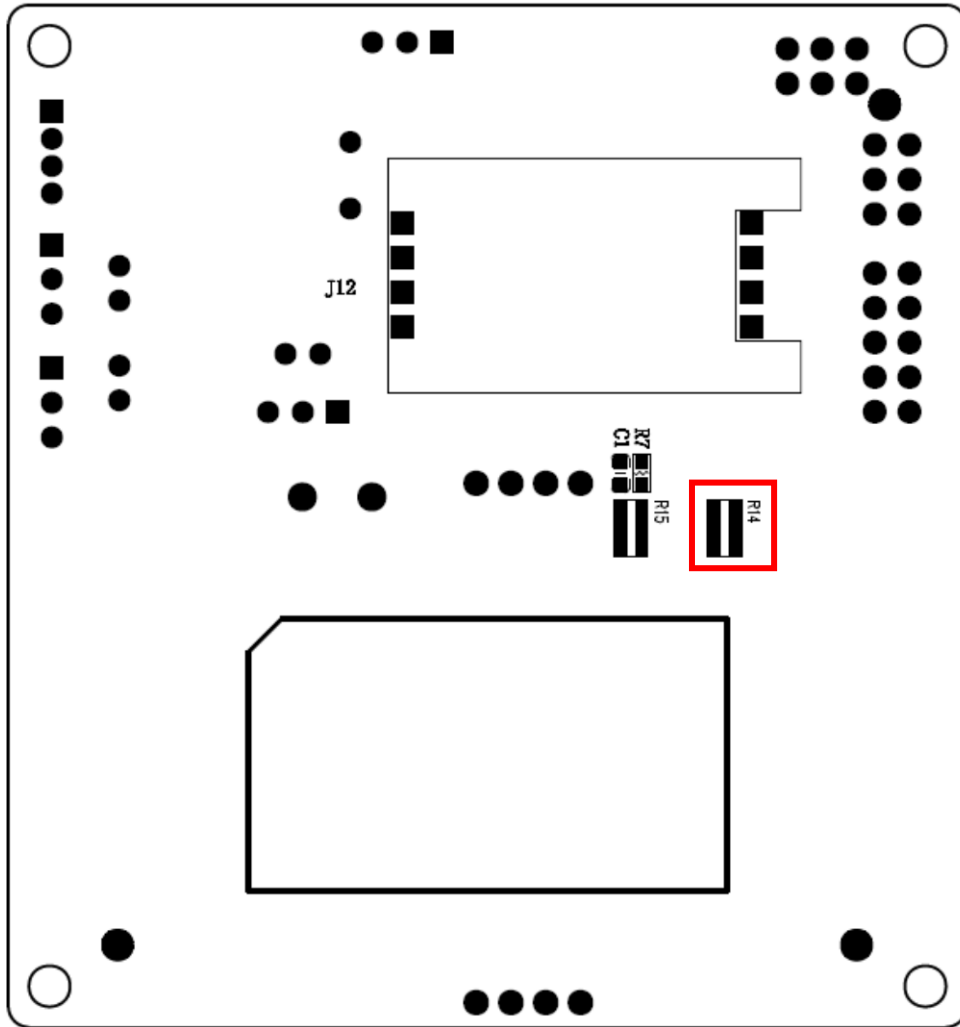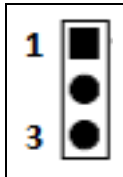

Figure 6: ACM38U-Y External Card Connector Resistor Jumper Placement

6.0. Extend power and card operation status signals

Aside from the smart card connector's signal, the LED status for power and card operation can be extended to other peripherals as well.
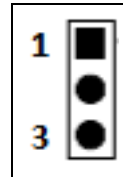
To do this:

1. Connect a jumper to **J9** and **J10** for the LED status of power and card signals.

J9

1	USB VCC
2	Not connected
3	Connected signal from the MCU

J10

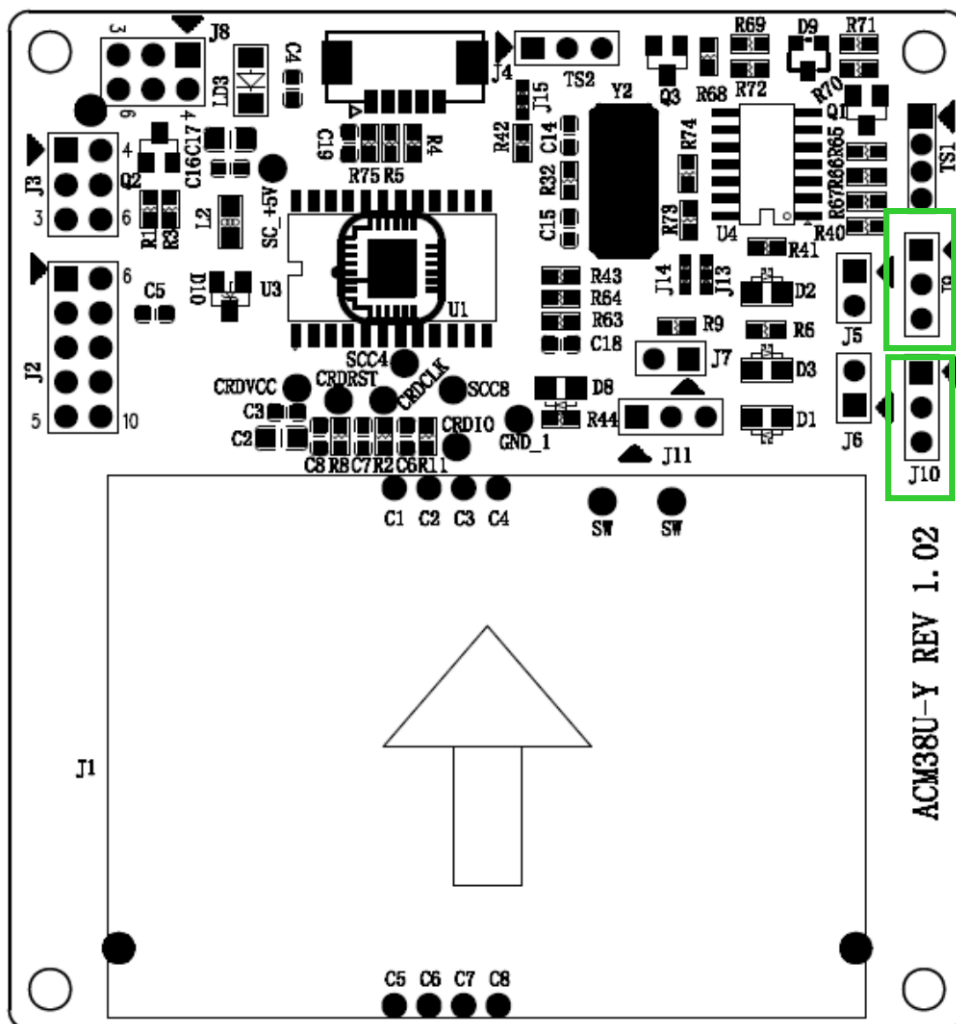| 1	USB VCC
2	Not connected
3	GND

Figure 7: ACM38U-Y Extended Power and Card Operation Status Signals