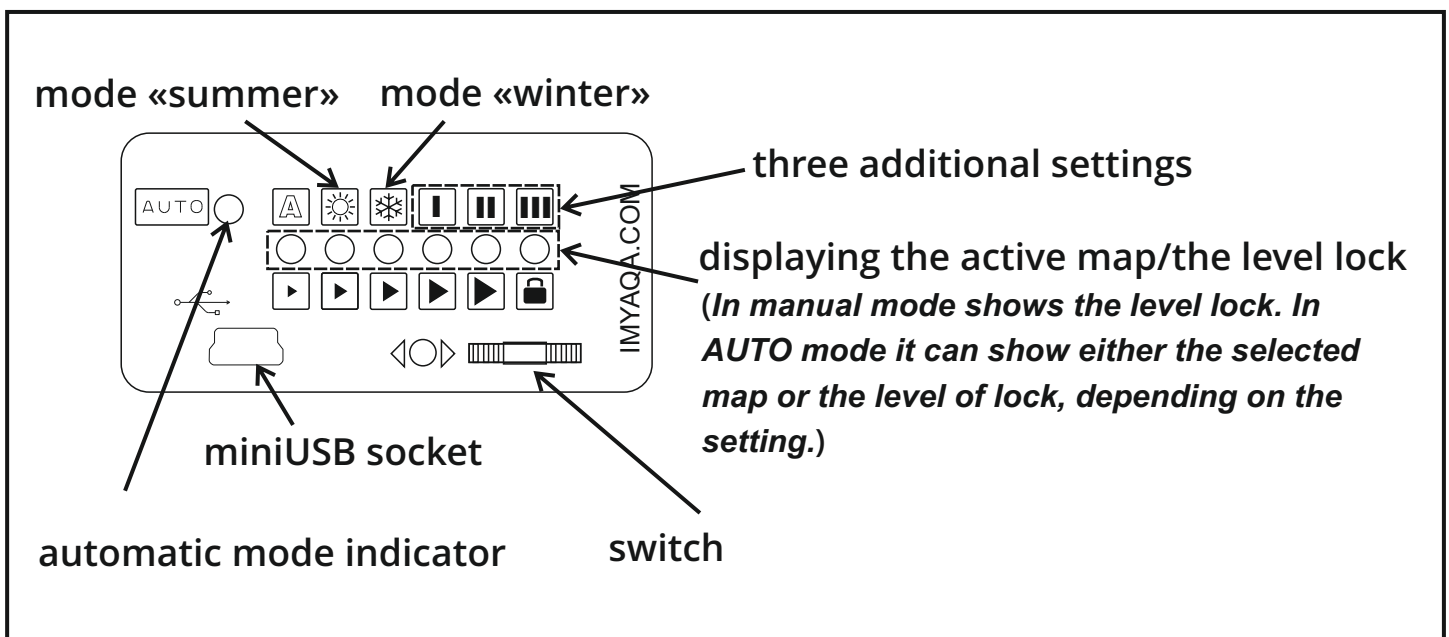# Manual for IMYAQA DCCD Controller

## SPECIFICATION

**IMYAQA DCCD Controller** is a controller for controlling the central differential of the cars having five or six-speed transmission with DCCD or center differential automatic transmission VTD.

The controller has 2 modes – manual and automatic ones. In the manual mode the driver independently adjusts the lock level. There are 5 adjustable maps in the automatic system: two of them are set to the «winter» and «summer» modes, three ones are independently adjusted at the request of the driver with the help of software.

You can control the controller: a AUTO button with a DCCD wheel and a Si-Drive panel or a switch on the controller panel. The level lock can be tracked on the STi DCCD cluster or on the controller.



mode «summer»    mode «winter»

three additional settings

displaying the active map/the level lock
(*In manual mode shows the level lock. In AUTO mode it can show either the selected map or the level of lock, depending on the setting.*)

miniUSB socket

automatic mode indicator          switch

**Control of operating modes:**

To switch between manual and automatic modes, press the auto button. To switch map sets in automatic mode, hold down the auto button until the LED blinks. After this, short pressing select the desired mode. While driving, switch modes on straight sections of the road, since the controller will need 0,5 seconds to load a new map.

### Characteristics:
- Dimensions 94×57×28 mm
- Aluminium case
- Supply voltage: 9 to 15 volts
- Consumed current with unlocked DCCD, not more than: 300mA
- Consumed current with locked DCCD, no more than 10A
- Frequency of signal processing, at least 250 times per second

**Trust the installation of the IMYAQA DCCD Controller to a qualified mechanic. If there are any problems, we will help you. To do this, write to the e-mail help@imyaqa.com. Remember that you are solely responsible for the incorrect installation of the IMYAQA DCCD Controller.**

## DECIDE ON THE BLOCK LOCATION

It is better to place the controller away from the heater radiator. If you want to hide the unit, take care of the long USB wire. You can immediately connect and bring it out, so that in the future there will be no problems with access to the USB connector.

## PREPARE THE POWER SYSTEM

**You need:**
- a 10 Amp fuse,
- an automotive relay,
- wiring.

The cross section of the supply wires and the wire connection of DCCD have at least $1mm^2$ as there is some interference. The larger the wire cross section is - the less noise will be in the air.

The cross section of signal wires is $0.5mm^2$.

Taking the supply circuit must be in close proximity to the battery through the fuse 10-15A, for example, immediately after the main fuse. Make sure that the negative cable (ground) is connected.

The scheme is standard: "+" battery > fuse > relay with switching current from 30A (must be triggered when the ignition is turned on) > DCCD unit. The fuse should be as close as possible to the "+" of the battery.

If you do not have a special tool for crimping connectors, you can use the pliers, followed by soldering the crimping place.

After the installation, check all connections for contact quality, the insulation of contact points. In the car it is allowed to use a twist or a clamp connector when connecting. It is recommended to use sealed connectors outside the cabin, and if there are no any - twisting and subsequent soldering of the connection.
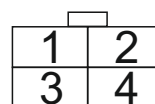
Ring all the circuits, making sure that when the ignition is switched on, the power is supplied to the controller.

*Diagram labels: +12V BATT, FUSE 10A, IGN, K2, DCCD Power, DCCD Ground*
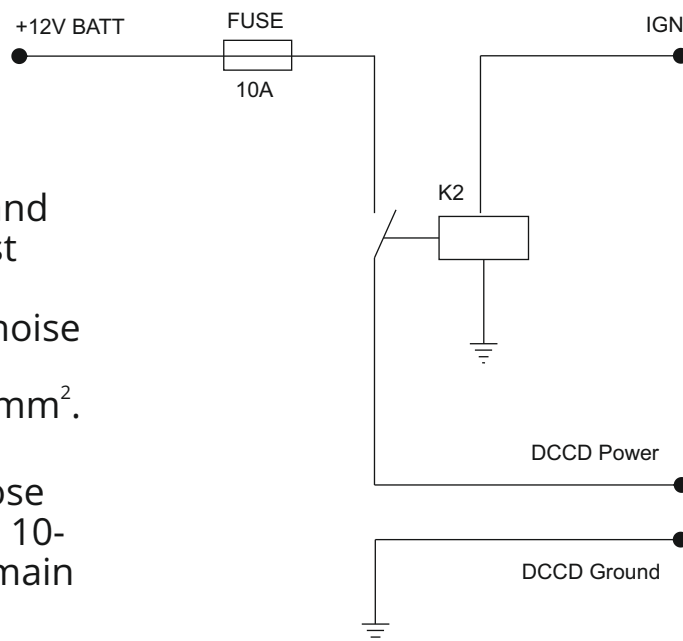
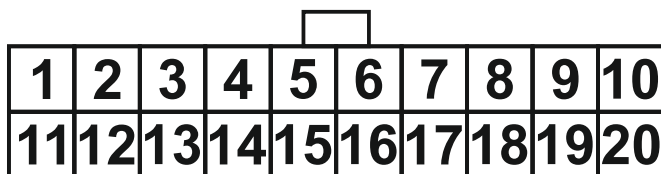## THE CONNECTION OF THE POWER CONNECTOR

**MT:** The coupling DCCD does not have any polarity, i. e. just plug in "DCCD+" and "DCCD-" contacts.

**AT:** When connecting the automatic box shank, connect only the "DCCD +" of this connector. We highly recommend the contact "DCCD -" for connecting to the ground wire at the transmission.

| DCCD | TYPE |
|---|---|
| 1 | GND |
| 2 | +12 V |
| 3 | DCCD + |
| 4 | DCCD - |

*Connector pinout: 1 2 / 3 4*

If you have any questions, please write to **help@imyaqa.com**

## ASSEMBLE THE SIGNALS



| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|----|
| 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |

| Pin | Function | Type | Specifications |
|-----|----------|------|----------------|
| 1 | Signal ground | output | |
| 2 | Button "-" | Input | contact normally open with a short to ground |
| 3 | Button "+" | Input | contact normally open with a short to ground |
| 4 | Indicator AUTO | output | |
| 5 | Indicator UNLOCK | output | |
| 6 | Indicator 1 | output | |
| 7 | Indicator 2 | output | |
| 8 | Indicator 3 | output | |
| 9 | Indicator 4 | output | |
| 10 | Indicator LOCK | output | |
| 11 | Throttle Position (sensor) | Input | analog signal with amplitude 0-5V |
| 12 | Speed sensor | Input | pulses with an amplitude of 0-5V |
| 13 | RPM | Input | pulses with an amplitude of 0-5V |
| 14 | Handbrake signal | Input | 0 to 12V |
| 15 | Brake signal | Input | 0 to 12V |
| 16 | Signal button AUTO | Input | Optional, not included. You can replace it with any button without fixing with normally open contacts, or purchase the original 83245FE041 |
| 17 | Signal ground | output | |
| 18 | Signal ground | output | |
| 19 | Signal wheel DCCD | Input | Optional, not included. You can replace it with any variable resistor with a rating of 5kΩ-20kΩ, or purchase the original 83243FA050 |
| 20 | "+" wheel DCCD | output | output +5V |

It is not allowed to connect the signal ground to the common ground of the vehicle, this may disrupt the correct operation of the controller. If it is not possible to use signal ground, for example, when connecting the "+" and "-" buttons on the steering wheel, use the ground of the car.

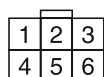If you have any questions, please write to **help@imyaqa.com**

## CONNECT CONTROLS

Turn on the ignition and make sure that the unit has been initialized and switched to the working mode. If everything is fine - start to connect the controls manual mode: SI-Drive button or AUTO button + DCCD Wheel. If necessary, connect the DCCD track on the STI cluster.
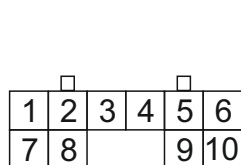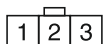
**SI-DRIVE**

| SI-DRIVE | DCCD |
|----------|------|
| 5 | 1 |
| 7 | 16 |
| 8 | 2 |
| 9 | 3 |

**A: i12 (GREEN)**

**COMBINATION METER**

| CM | DCCD |
|----|------|
| 6 | 5 |
| 5 | 6 |
| 12 | 7 |
| 13 | 8 |
| 14 | 9 |
| 15 | 10 |
| 16 | 4 |

**B339 (BLUE)**

**AUTO BUTTON**

| BUTTON | DCCD |
|--------|------|
| 4 | 1 |
| 5 | 16 |

**B258**

**DRIVERS CONTROL CENTER DIFF SWITCH**

| DIFF SW | DCCD |
|---------|------|
| 1 | 18 |
| 2 | 19 |
| 3 | 20 |
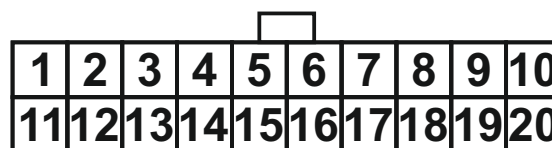
## INSTALL G-SENSOR

1. Maximum in the center of the car;
2. In a horizontal position;
3. With a wire in the direction of the car.

Connect the connector to the DCCD.

## CHECK THE CONNECTIONS

Check the installation: turn the ignition on, turn the controller to the manual mode by briefly pressing the AUTO button, turn the wheel, make sure that the display shows the current level of the lock.

To check the correct connection of the DCCD, place the car on a flat surface, completely lock the differential and try to move with the wheels turned out. If you feel resistance when driving - everything is fine, the DCCD works and is correctly connected.

If you have any questions, please write to **help@imyaqa.com**

# SETTING, *page 1*

## BASIC SETTING

Download the driver port DCCD and the software on a laptop or a tablet running Windows. Check the wire connections carefully. Turn on the ignition to make sure the controller is connected.

Start the car. Connect the USB cable from the controller to the computer. Run the program.

**Click the "General settings" tab:**
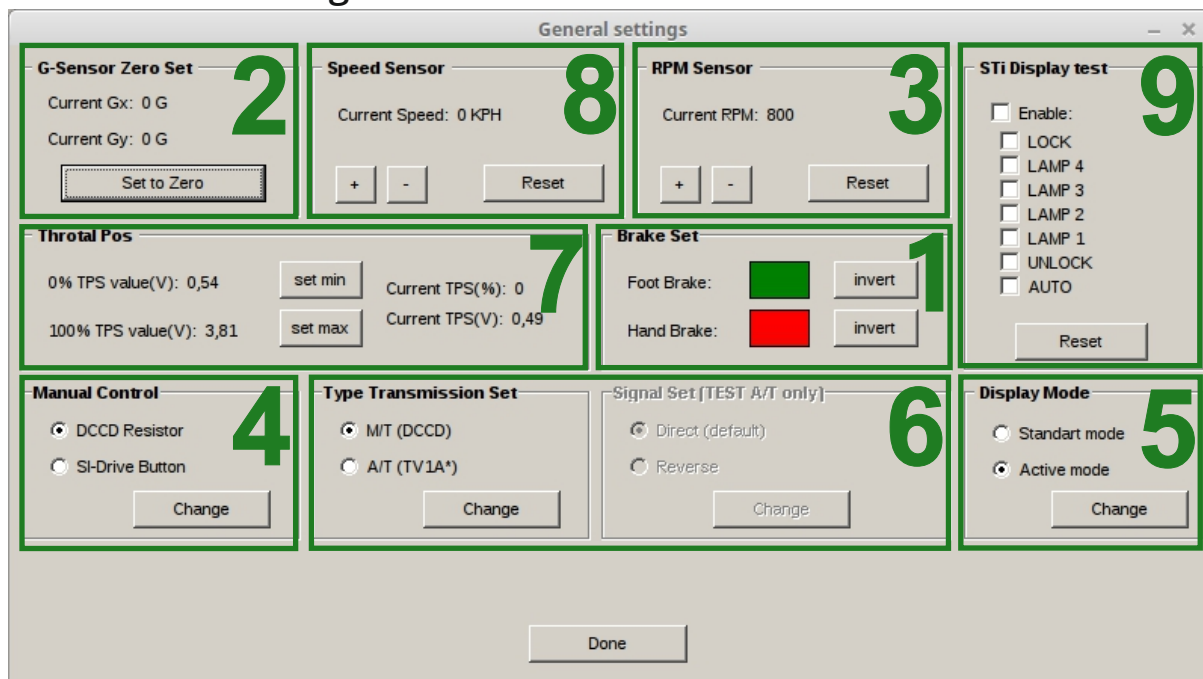


1. Check and adjust the hand and foot brakes: when the hand or the foot brake is activated, the red light in "Brake Set" is on and the green light is on when the brake is not activated. If it is not so - change the color by clicking "invent".

2. Place the car on a horizontal surface and reset the G-Sensor by pressing the "Set to Zero" button.

3. Compare the current engine speed with the speed displayed by the controller. If there are discrepancies, adjust the "+" and "- "buttons.

4. Select the type of control in the manual mode: for the Si-Drive panel – "Si-Drive Button", for the AUTO button and the wheel – "DCCD Resistor".

5. Select the display mode: the standard mode shows which mode or map is active, and the active mode displays the current level of the lock.

6. Select the transmission type: manual or automatic. If it is necessary, invert the solenoid control signal.

7. Set the minimum and maximum throttle position: when the throttle pedal is not pressed, press "set min" and when the throttle pedal is fully depressed, press "set max". Check the setting result, in "current TPS (%)".

8. Dial the speed and compare the current speed, with the speed displayed by the controller. When diverging, adjust the "+" and "- "buttons.

9. If you connect an STI dashboard with a DCCD track, you can control the operation with "STI Display test".

To check the setting result, press "Show log" and start moving.

If you have any questions, please write to **help@imyaqa.com**

## MAP SETTING

The controller has 5 maps. Map 1 is set to the «summer» mode, and map 2 is set to the «winter» mode. All maps can be customized. Each setting consists of 5 options and 5 maps.

Options ⟶

Maps ⟶
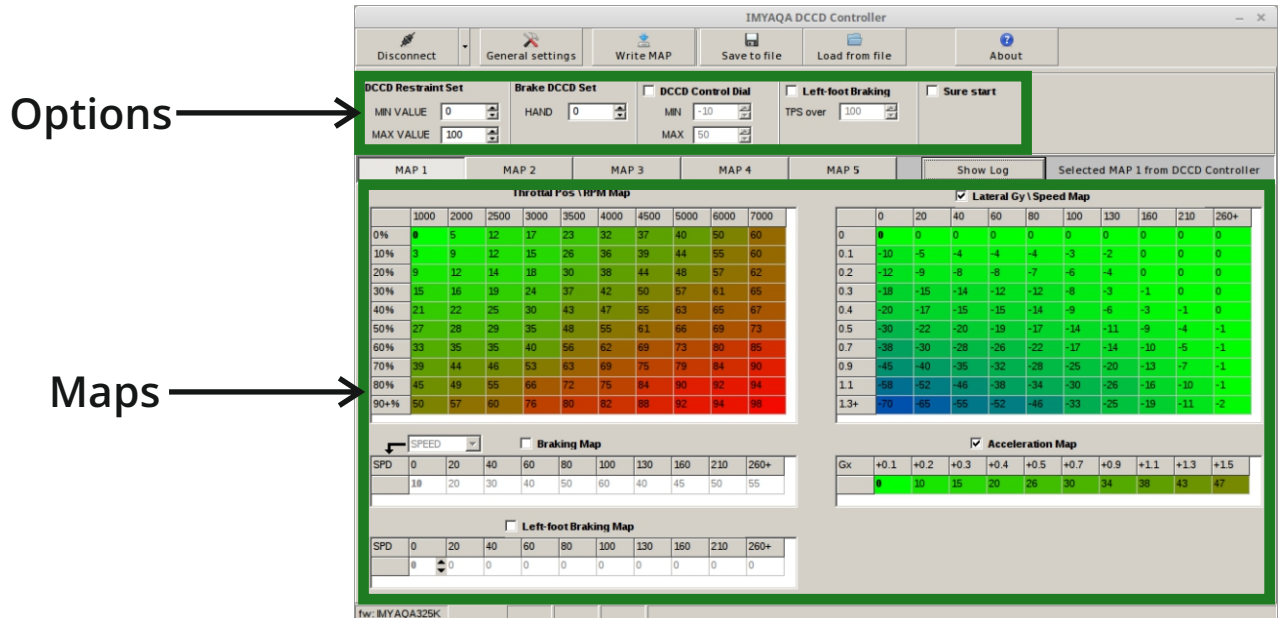


## Options:

- **DCCD Restraint Set** has two values MAX (%) and MIN (%), sets the limit DCCD lock. For example, if MIN = 10 and MAX = 60 are specified, DCCD will not unlocked by less than 10% and locked by more than 60% for any resulting data.

- **Brake DCCD Set** has a parameter (%), for manual brakes. This value allows you to set the level of the lock when the hand brake is applied.

- **DCCD Control Dial** – has two parameters MIN (val) and MAX(val), allows you to increase or decrease the resulting value using the DCCD wheel. For example, you activate and configure the DCCD Control Dial function by setting MIN = -50 and MAX = 50. The value from -50 to 50 will be added to the result of the work on the maps, depending on the position of the DCCD wheel. That is, without changing the map settings in general, you can change the resulting value within certain limits. You need to be careful when you activate this option and always remember which settings it is active.

- **Left-foot Braking** activates the Left-Foot Parking Map. It requires the setting of the throttle opening border TPS over (%), which will exceed the value of processing on the Left-Foot Parking Map.

- **Sure start** activates when the car is completely stopped and blocks DCCD slightly when starting. This gives a good start on slippery road surfaces.

If you have any questions, please write to **help@imyaqa.com**

## MAP SETTING

**Maps:**

- **TPS\RPM.** It determines the resulting value based on throttle position (TPS) and engine speed (RPM).

- **Lateral Gy\SPD.** It defines the resulting value depending on the lateral acceleration force (Lateral Gy) and vehicle speed (SPD).

- **Acceleration Map.** It defines the level of additional lock at a certain straight-line acceleration (Gx).

- **Braking Map.** It defines the braking map.

- **Left-foot Braking Map.** It defines the braking map with the left foot.

Change the values of options and maps according to your needs until you achieve the desired result. You can also save maps or download them from your computer.

## Simplified controller algorithm IMYAQA DCCD:

Brake pedal pressed — YES — TPS → If active **Left-foot Braking Map** and **TPS > «TPS over»** option — YES — SPEED → Left Foot Braking MAP result

NO → Hand brake pressed — YES — HAND BRAKE → "Hand brake DCCD set" option

NO:
- Gx or SPEED → Braking MAP result — if active
- Gx → Acceleration MAP result — if active
- SPEED / Gy → Lateral Gy /SPEED MAP result — if active
- RPM / TPS → TPS/RPM MAP result

BRAKE

**Modify result value**
**If set «DCCD Restraint Set» option**
**If set DCCD Control dial option**
**If active «Sure Start» option**

**DCCD result**

If you have any questions, please write to **help@imyaqa.com**