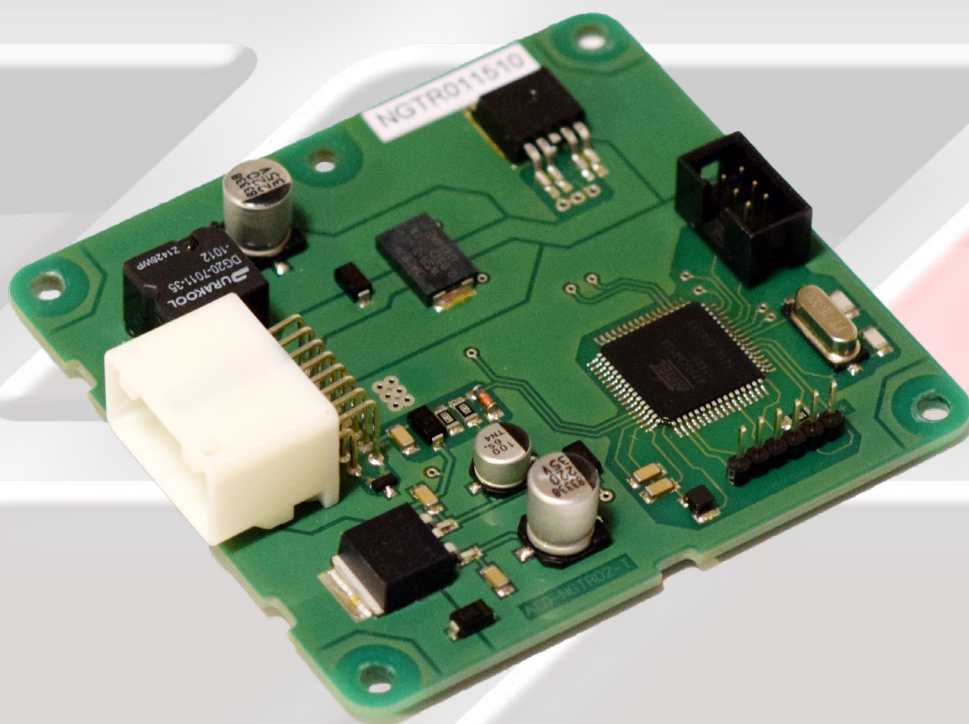




INSTRUCTION MANUAL 4.1





DESCRIPTION OF FUNCTIONS OF THE ALL WHEEL DRIVE TRACTION CONTROL SYSTEM FOR NISSAN GTR

The All Wheel Drive Traction Control System (AWD TCS) is very important for controlling vehicles at a high speed and in difficult driving conditions. The AWD TCS is both a road and race system that will enable the Nissan GTR to drive more aggressively without the loss of traction on the wheels.

The AWD TCS is a revolutionary system that utilises all of the available data and sensors in the GTR to adjust the torque split between front and rear wheels to deliver maximum traction!

In high horsepower GTRs, being able to deliver all the power to the wheels while maintaining full traction is the biggest challenge to tuners. Additionally, handling suffers.

The AWD TCS puts the car GTR back on rails! It is fast reacting to minimise slippage and the mapping allows the braking, cornering and acceleration of the GTR all to be improved significantly.

The AWD TCS finally allows you to utilise the GTR's maximum potential with fully customisable maps for all conditions, which no other controller on the market can deliver!

MAIN ADVANTAGES

- 1. Storing capacity of up to 4 created maps right in the AWD TCS unit. Switching over by the toggle button on the vehicle dashboard. Active maps are between 1-4.***
- 2. A possibility to create your own map files.***
- 3. Maximum torque split available between front and rear wheels of 50/50.***
- 4. Burnout mode with differential deactivation.***
- 5. Plug and play***
- 6. No wires or any plastic boxes showing in the interior***

GTR AWD TCS Contents

- 1. Installation and setup***
- 2. Selection of maps***
- 3. Burnout mode***
- 4. Map Tab explained***
- 5. Creating a new map***
- 6. Password protection of maps***
- 7. Headers variable***
- 8. Wheel vs Angle values***
- 9. Diagnostics***
- 10. Setup tab explained***
- 11. Brake Sensitivity***
- 12. Memory ACD Maps***
- 13. Launch control***
- 14. Upload of upgraded firmware***
- 15. Datalogger***

1. INSTALLATION and SETUP

The GTR AWD TCS does not require specialist setup. There is no setup procedure necessary for compatability of the AWD TCS unit. It is only necessary upon installation to ensure the ignition and engine is switched off.

Maps can be selected by activating the Torque split screen on the dash.

To install the unit, locate the original ECU under the front passengers seat. It is hidden in the floor under the carpet.

Replace the OEM unit with the Kotouc Gearboxes GTR AWD TCS unit.

2. SELECTION OF MAPS

CHANGING OF ACTIVE MAP

It is necessary to have the TORQUE SPLIT graph active on the dash.

To change the map, select the left toggle switch DOWN, UP, DOWN, UP. This combination must be done within 2 seconds. This will activate the change map mode.



After the torque split graph will start flashing. The maps are set up as follows:

Map 1 = Torque split 25%

Map 2 = Torque split 50%

Map 3 = Torque split 75%

Map 4 = Torque split 100%

Each press of the left toggle switch down will result in the next map being selected.

Once the desired map has been selected, the map will be saved after a few seconds and the torque split will stop flashing.

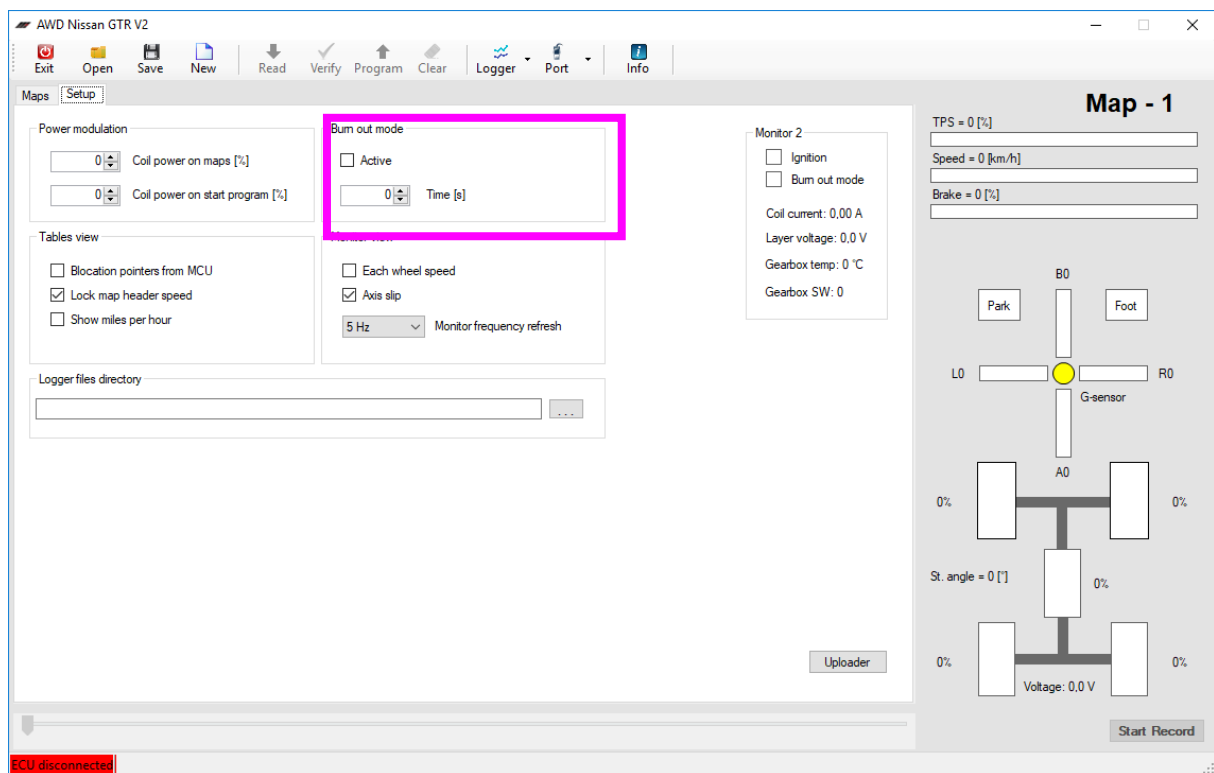
Note: Maps do not have a constant 25, 50, 75 or 100% torque split between the front and rear wheels. Torque split graph only indicates which map is selected.

3. BURNOUT MODE

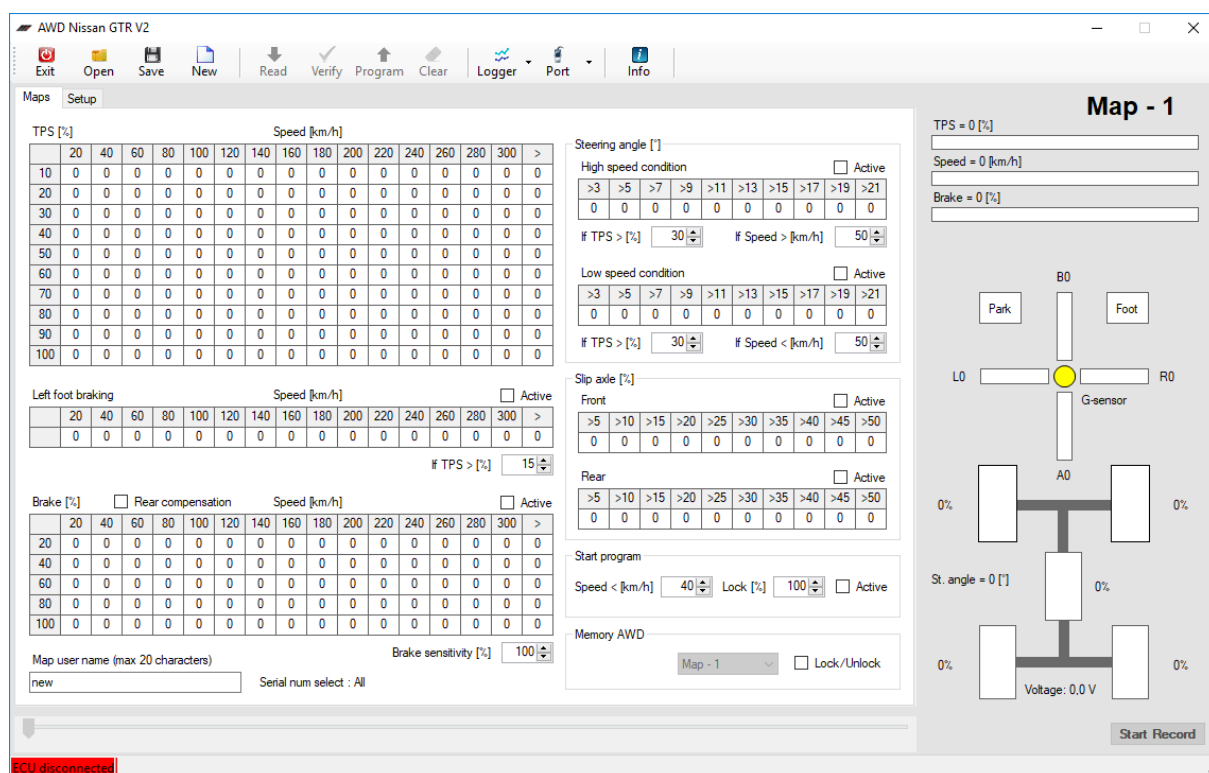
It is possible to completely disable the center differential and drive only the rear wheels. To do this, a map can be created and saved where all values are 0 (zero). Then select this map on the dash for 100% rear wheel drive.

**Alternatively, burnout mode is active when the change map mode is active. Before any map has been changed, the differential is switched off so the GTR will be in full rear wheel drive only to make a short burnout. Once the change map mode time elapses, the differential will again default to the previous map that was selected.
[check firmware version for this functionality]**

**Tick active burnout mode
Set ACTIVE time (seconds)**



4. MAP TAB EXPLAINED



Top Left: Main mapping table Speed kmph x TPS%

This table is used to input the primary values for lock of the center differential

Middle Left: Left Foot braking Speed kmph x Foot Brake x TPS

This table is used as a replacement to the main mapping table if both the TPS and Foot Brake Pedal sensor is active. The TPS>% condition field can be toggled to adjust the point of activation of the table.

Bottom Left: Main brake table Speed kmph x Foot Brake%

This table is used as a replacement to the main mapping table and helps fine tune the adjustment of lock based on the pressure applied to the brake pedal. The sensitivity of the brake pedal can be adjusted to suit. 100% is maximum braking pressure on a dry tarmac road.

Top Right: Compensation tables Steering Angle, Slip Axle

These tables are used in addition to the main mapping table. Steering angle and slip axle help fine tune the lock on the center differential.

Bottom right: Start program and active map info

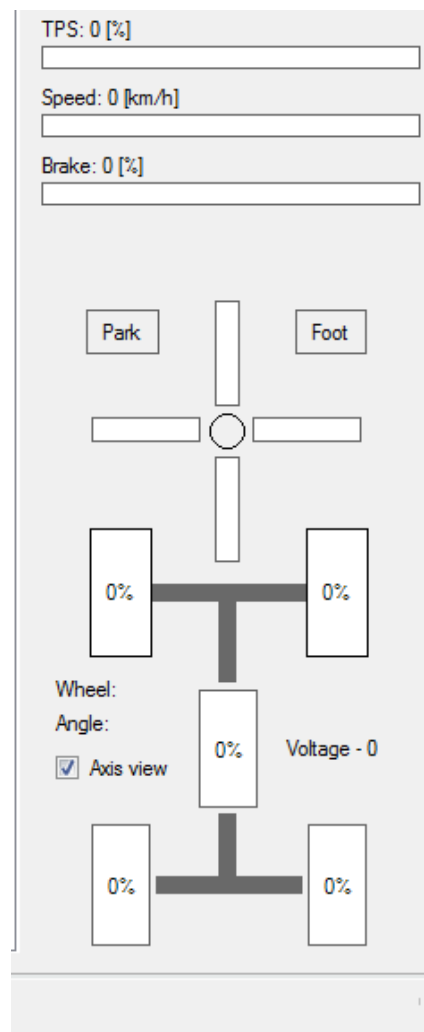
There is a start program feature for launching from a standing start.

Far Right: Live Graphical AWD TCS interface

After the AWD TCS unit is connected to a notebook, the data may be read when driving - graphic representation of the current state of the vehicle (very helpful for completing the notion of how individual sensors work and how they influence the clamp of the centre differential in percentage).

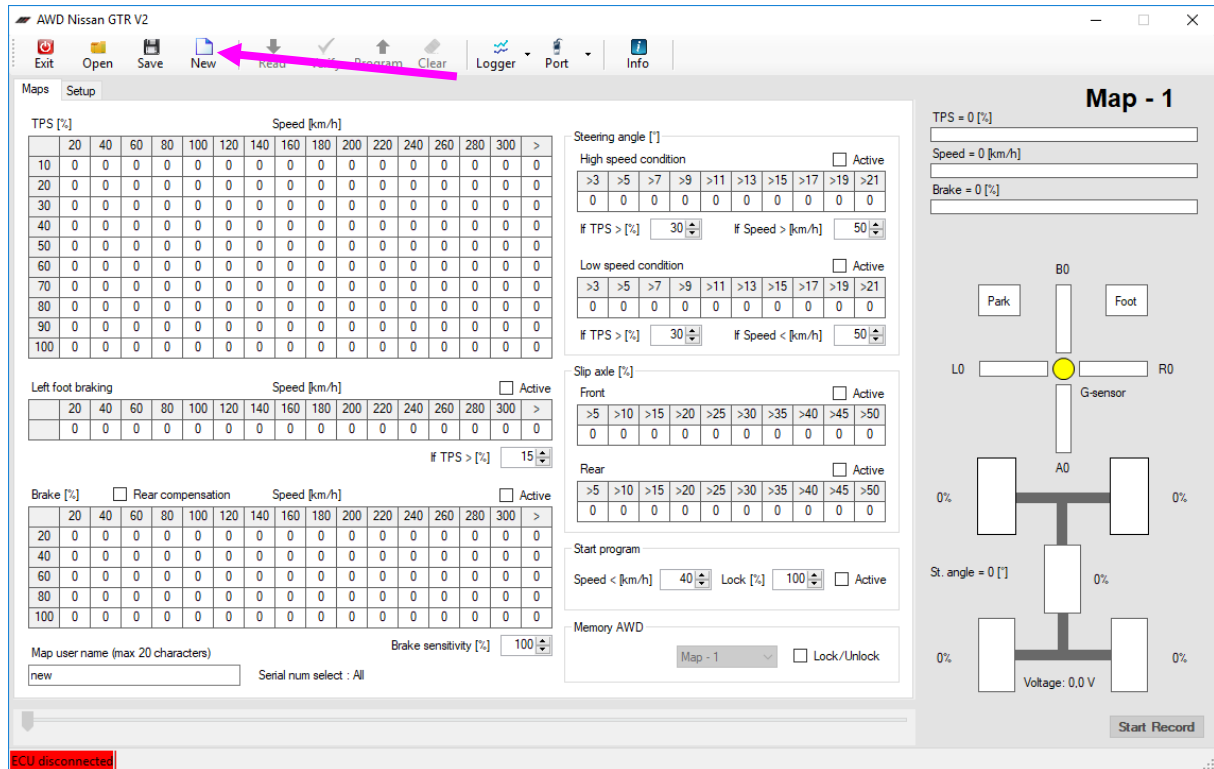
Live Graphical AWD TCS interface

- 1. TPS - indication of the gas pedal position in the range of 0-100%***
- 2. SPEED - indication of the speed of the vehicle (in km/hour)***
- 3. BRAKE - indication of the pressure on the brake***
- 4. PARK - signals the hand brake engagement***
- 5. FDOT - signals the use of brake pedal (brake light sensor)***
- 6. G- sensor - shows the value of longitudinal and lateral overload***
- 7. SLIP indication - shows the slip of individual wheels (0-100%). If you click the AXIS view field, the slip of the fore axle as against the rear axle will be graphically represented***
- 8. % indication - shows the level of clamp of the centre differential in %***



5. CREATING A NEW MAP

It is necessary to press NEW to create a new map.



After this, you can enter new values to the mapping table.

If you wish to edit maps, only overtype the previous data to program.

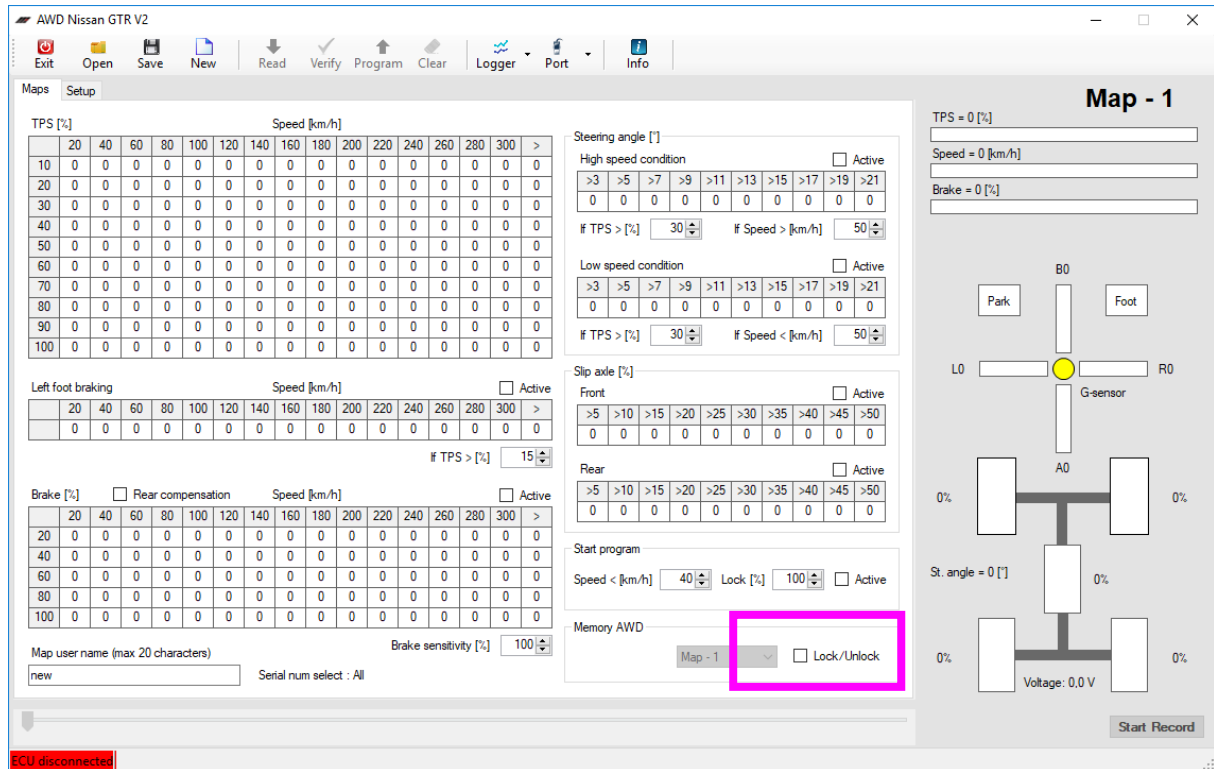
The SAVE button will allow you to save that map to your PC hard drive.

The PROGRAM button will save the map onto the selected map position in the memory AWD field.

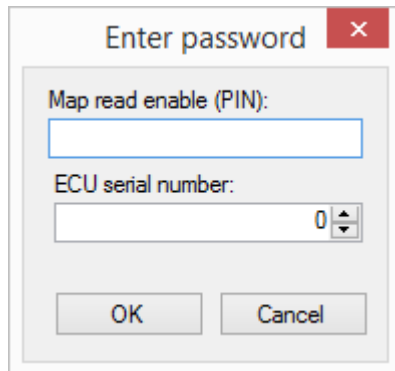
You can create an unlimited amount of maps and save them to your PC. Maximum 4 maps can be saved into the controller on any position desirable.

6. PASSWORD PROTECTION OF MAPS

To protect a map file from being viewed, check the „LOCK / UNLOCK“ box



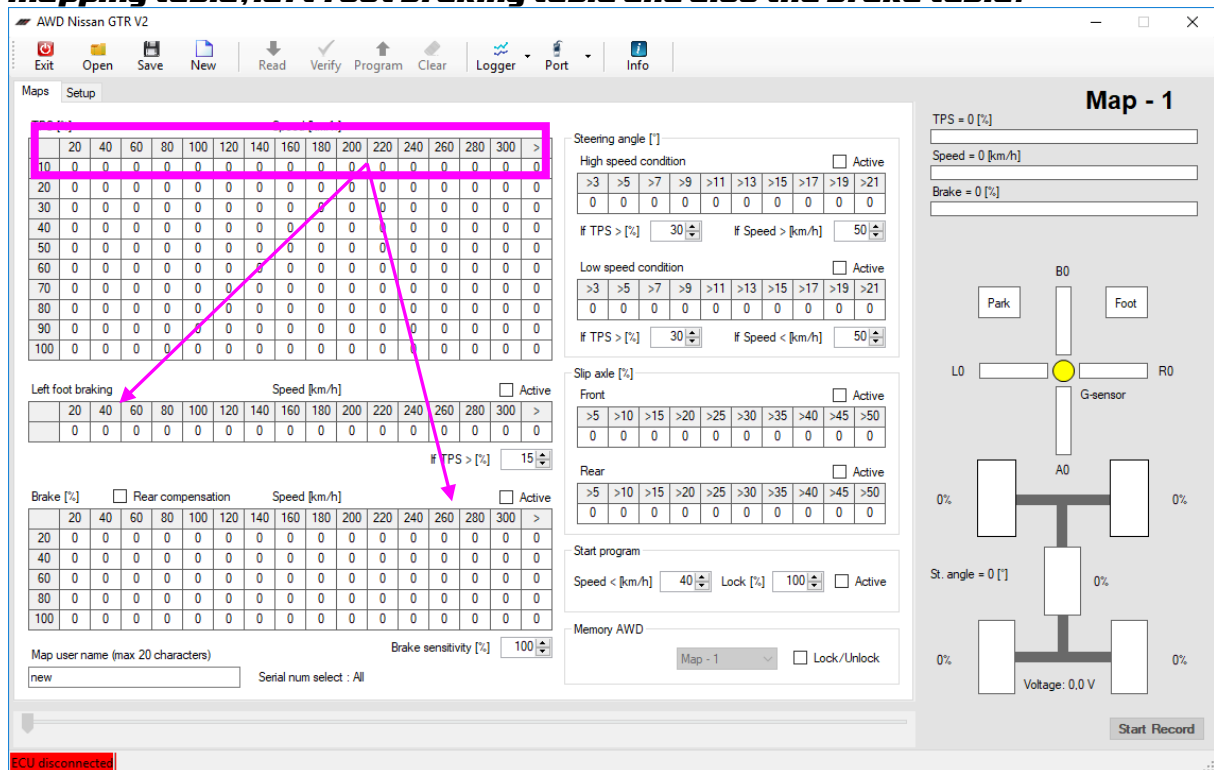
Password is of your choosing as a 4 digit pin code only.



NOTE: The password protection is associated to the map. To lock all maps, you must password protect each individually. Changes are saved only by the Program button. It is possible to add a serial number to the map so the map will run on only the corresponding GTR unit.

7. HEADERS VARIABLE

It is possible to amend the header parameters so the mapping of the unit can be either more condensed or expanded. The headers are on the main mapping table, left foot braking table and also the brake table.



AWD Nissan GTR V2

Exit Open Save New Read Verify Program Clear Logger Port Info

Maps Setup

Left foot braking

Speed [km/h]	20	40	60	80	100	120	140	160	180	200	220	240	260	280	300
20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Brake [%]

Speed [km/h]	20	40	60	80	100	120	140	160	180	200	220	240	260	280	300
20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Map user name (max 20 characters)

new

Serial num select : All

Brake sensitivity [%] 100

Map - 1

TPS = 0 [%]

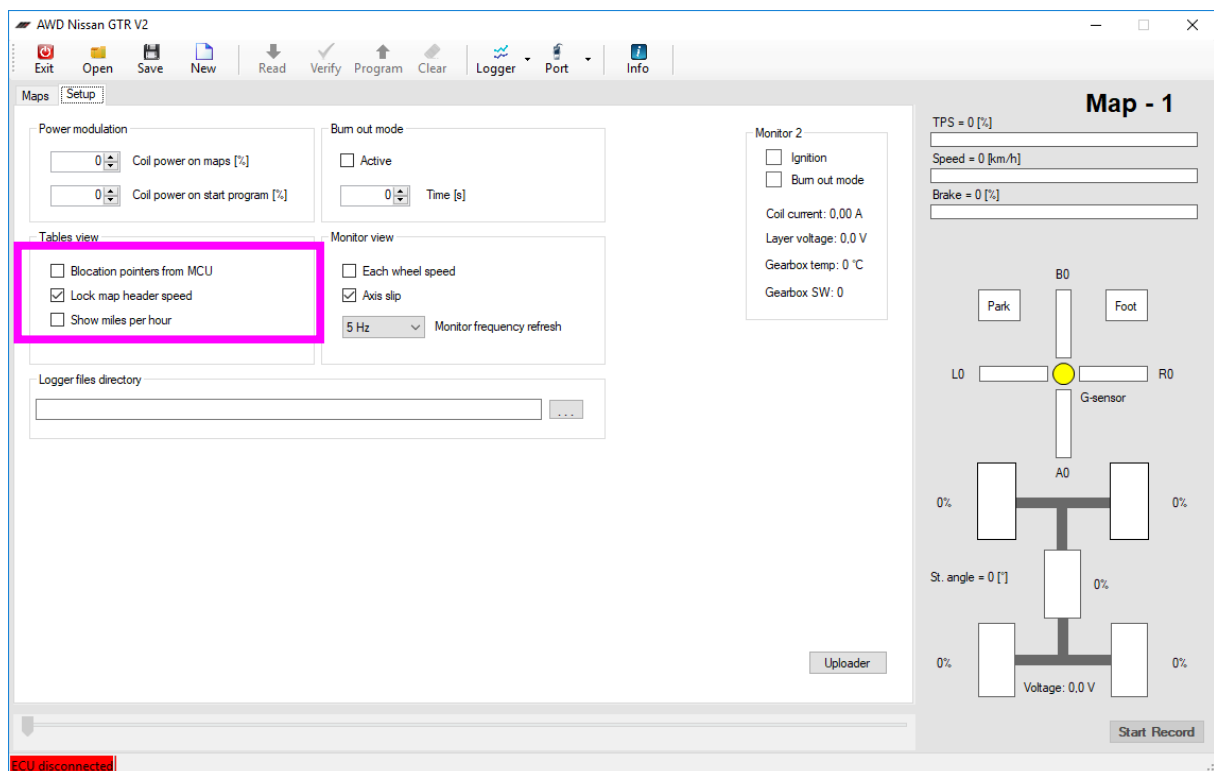
Speed = 0 [km/h]

Brake = 0 [%]

Start Record

ECU disconnected

They can be changed independently or together. Use the toggle box on the setup tab „Lock map header speed“ to adjust the settings. Always program your changes



AWD Nissan GTR V2

Exit Open Save New Read Verify Program Clear Logger Port Info

Maps Setup

Power modulation

Coil power on maps [%] 0

Coil power on start program [%] 0

Tables view

- ☐ Blocation pointers from MCU
- ☒ Lock map header speed
- ☐ Show miles per hour

Logger files directory

Burn out mode

Active

Time [s] 0

Monitor view

- ☐ Each wheel speed
- ☒ Axis slip
- 5 Hz
- Monitor frequency refresh

Monitor 2

- ☐ Ignition
- ☐ Burn out mode

Coil current: 0.00 A

Laser voltage: 0.0 V

Gearbox temp: 0 °C

Gearbox SW: 0

Map - 1

TPS = 0 [%]

Speed = 0 [km/h]

Brake = 0 [%]

Start Record

ECU disconnected

Right click once on the parameter cell to adjust values. The cell will appear yellow.

If a mistake is made, the system will not allow you to save the map.

NOTE: Any changes you make, you must press the PROGRAM button to save your changes to the ACD computer. If not, changes will be lost. Alternatively, pressing save will save the map file to an alternative medium.

The mapping table is active only in the range of the conditioning parameters TPS and speed.

8. WHEEL ANGLE vs STEERING ANGLE values

The steering angle mapping table has is split into a high speed and low speed condition. Both have conditioning of speed and TPS. This will fine tune the car for better handling around tight corners and long high speed cornering.

There are 2 ways of analysing the steering and cornering of the car. That is by Wheel angle and steering angle.

WHEEL ANGLE relates to the steering wheel turn and **STEERING ANGLE** relates to the angle ($^{\circ}$) of the front tyres.

Parameters

WHEEL ANGLE: max scores L420 : R420 (left and right)

STEERING ANGLE: max scores L30 :R30 (left and right)

Wheel angle max values determined from GEMS dash +/- 420.

AWD Nissan GTR V2

Exit

Open

Save

New

Read

Verify

Program

Clear

Logger

Port

Info

Maps

Setup

TPS [%]

	20	40	60	80	100	120	140	160	180	200	220	240	260	280	300	>
10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
70	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Speed [km/h]

Left foot braking

20

40

60

80

100

120

140

160

180

200

220

240

260

280

300

>

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

If TPS > [%]

15

Brake [%]

Rear compensation

20

40

60

80

100

120

140

160

180

200

220

240

260

280

300

>

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

Map user name (max 20 characters)

new

Brake sensitivity [%]

100

Map user name (max 20 characters)

new

Serial num select : All

Steering angle [°]

High speed condition

>3

>5

>7

>9

>11

>13

>15

>17

>19

>21

0

0

0

0

0

0

0

0

0

0

If TPS > [%]

30

If Speed > [km/h]

50

Low speed condition

>3

>5

>7

>9

>11

>13

>15

>17

>19

>21

0

0

0

0

0

0

0

0

0

0

If TPS > [%]

30

If Speed < [km/h]

50

Slip angle [%]

Front

>5

>10

>15

>20

>25

>30

>35

>40

>45

>50

0

0

0

0

0

0

0

0

0

0

Rear

>5

>10

>15

>20

>25

>30

>35

>40

>45

>50

0

0

0

0

0

0

0

0

0

0

Start program

Speed < [km/h]

40

Lock [%]

100

Memory AWD

Map - 1

Map - 1

TPS = 0 [%]

Speed = 0 [km/h]

Brake = 0 [%]

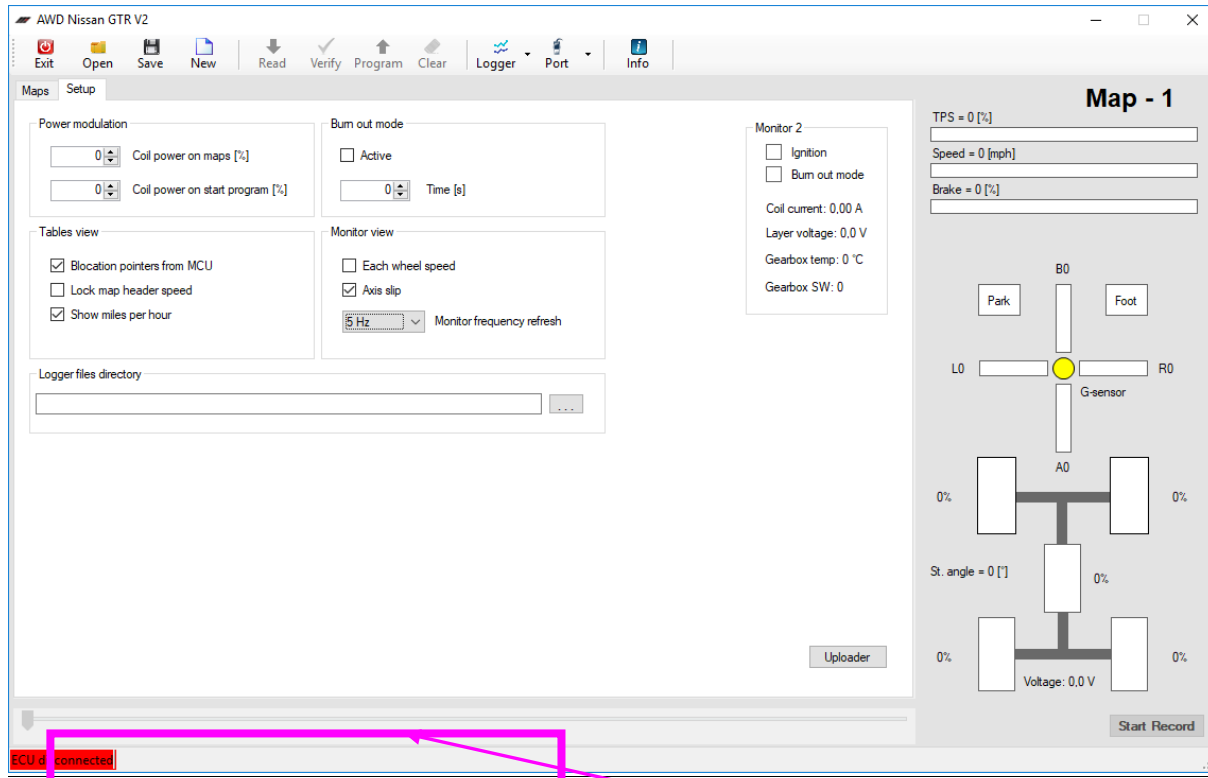
Map - 1

Start Record

ECU disconnected

9. DIAGNOSTICS

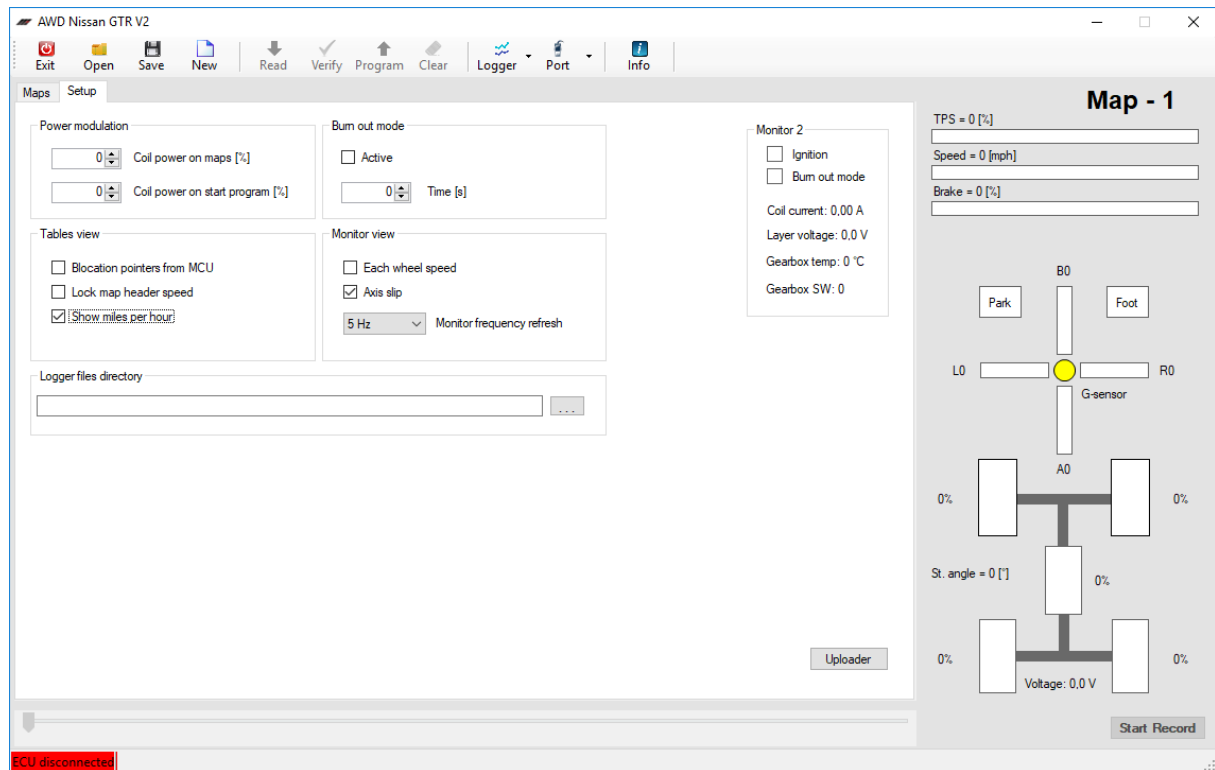
Should there be any errors in the system, it is possible to diagnose the issue with the MONITOR 2 screen



Simply connect the software and quote your Serial number and FW code found in the status bar or the software and a technik will be able to assist.

10. SETUP TAB EXPLAINED

The setup page controls a number of important features in in GTR AWD TCS unit. These settings are saved to the unit, not the individual maps.



POWER MODULATION

Coil power on maps%: Refers to the amount of power that the coil will operate with. 60% is the standard default point which is satisfactory for a car of 800HP. It can be adjusted as seen fit. The correct setting is when the power level of the coil turns the differential without any slipping.

Coil on start program%: Refers to the power to the coil when the lunch control semente is activated

TABLES VIEW

Blockation pointers from MCU: turn off indication light on maps.

Lock map header speed: Independent or combined toggling of header changes

Show miles per hour: Toggle between MPH and KMPH

BURNOUT MODE

See charter 3

MONITOR VIEW

Each wheel speed: Toggle on live data wheel speed / % slip

Axis slip: Toggle on live data individual wheel or axis slip

Monitor frequency refresh: Record speed of datalogger

MONITOR 2

Quick view systém analysis

UPLOADER BUTTON

This is used to upload inside the ACD computer new versions of firmware.

LOGGER FILES DIRECTORY

Upload your saved datterlogger files here to playback for analysis

11. BRAKE SENSITIVITY

It is possible to change the sensitivity of the brake pedal to suit your car. The brake sensitivity feature is only associated with the main brake table. The level of 100% is the base value for changes to be calculated. Base value of 100% is determined from the maximum stopping power of the GTR on dry tarmac conditions during testing.

The brake sensitivity has a value range from 50%-150%. Should your car have a higher or lower level of grip, then you can adjust the sensitivity accordingly.

For example: Any changes to the setting of the brake sensitivity, the system will recalculate so it will be max 100% brake percentage on the brake mapping table.

NOTE: The TPS % toggle box is related to the left foot brake table, not the main brake map table.

NOTE: Brake sensitivity is programmed to the selected map only. Each map can have different brake sensitivity.

AWD Nissan GTR V2

Exit Open Save New Read Verify Program Clear Logger Port Info

Maps Setup

TPS [%]

	20	40	60	80	100	120	140	160	180	200	220	240	260	280	300	>
10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
70	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Speed [km/h]

Left foot braking

	20	40	60	80	100	120	140	160	180	200	220	240	260	280	300	>
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

If TPS > [%] 15

Brake [%]

	20	40	60	80	100	120	140	160	180	200	220	240	260	280	300	>
20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Speed [km/h]

Rear compensation

Brake sensitivity [%] 100

Map user name (max 20 characters) new

Serial num select : All

Steering angle [°]

High speed condition

>3	>5	>7	>9	>11	>13	>15	>17	>19	>21
0	0	0	0	0	0	0	0	0	0

If TPS > [%] 30 If Speed > [km/h] 50

Low speed condition

>3	>5	>7	>9	>11	>13	>15	>17	>19	>21
0	0	0	0	0	0	0	0	0	0

If TPS > [%] 30 If Speed < [km/h] 50

Slip axle [%]

Front

>5	>10	>15	>20	>25	>30	>35	>40	>45	>50
0	0	0	0	0	0	0	0	0	0

Rear

>5	>10	>15	>20	>25	>30	>35	>40	>45	>50
0	0	0	0	0	0	0	0	0	0

St. angle = 0 [°]

Speed < [km/h] 40 Lock [%] 100

Memory AWD

Map - 1

Lock/Unlock

Map - 1

TPS = 0 [%]

Speed = 0 [km/h]

Brake = 0 [%]

Diagram showing car layout with sensors (G-sensor, L0, R0, A0) and actuators (Park, Foot, Voltage: 0.0 V).

Start Record

ECU disconnected

Compensation Check Box

The „Compensation“ check box associated with the main brake table when ticked, will add into the diff lock the rear axle slippage % mapping values.

AWD Nissan GTR V2

Exit Open Save New Read Verify Program Clear Logger Port Info

Maps Setup

TPS [%]

	20	40	60	80	100	120	140	160	180	200	220	240	260	280	300	>
10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
70	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Speed [km/h]

Left foot braking

	20	40	60	80	100	120	140	160	180	200	220	240	260	280	300	>
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

If TPS > [%] 15

Brake [%]

	20	40	60	80	100	120	140	160	180	200	220	240	260	280	300	>
20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Map over time (map G-sensors)

Serial num select : All

Brake variability [%] 100

Steering angle [°]

High speed condition

>3	>5	>7	>9	>11	>13	>15	>17	>19	>21
0	0	0	0	0	0	0	0	0	0

If TPS > [%] 30 If Speed > [km/h] 50

Low speed condition

>3	>5	>7	>9	>11	>13	>15	>17	>19	>21
0	0	0	0	0	0	0	0	0	0

If TPS > [%] 30 If Speed < [km/h] 50

Slip axle [%]

Front

>5	>10	>15	>20	>25	>30	>35	>40	>45	>50
0	0	0	0	0	0	0	0	0	0

Rear

>5	>10	>15	>20	>25	>30	>35	>40	>45	>50
0	0	0	0	0	0	0	0	0	0

Start program

Speed < [km/h] 40 Lock [%] 100

Memory AWD

Map - 1

Lock/Unlock

Map - 1

TPS = 0 [%]

Speed = 0 [km/h]

Brake = 0 [%]

0% 0% 0% 0%

St. angle = 0 [°]

Voltage: 0.0 V

Start Record

ECU disconnected

12. MEMORY AWD TCS MAPS

The AWD TCS has a possibility to run with 4 maps.

Map 1 - 25% Torque split level
Map 2 - 50% Torque split level
Map 3 - 75% Torque split level
Map 4 - 100% Torque split level

Maps can be saved to a computer and loaded also to additional AWD TCS units. If any values are edited directly inside the AWD TCS unit, it is necessary to press the program button to save those changes.

The screenshot shows the 'Map 1' configuration screen in the 'AWD Nissan GTR V2' software. The interface is divided into several sections:

- Menu Bar:** Exit, Open, Save, New, Read, Verify, Program, Clear, Logger, Port, Info.
- Maps Setup:** A tab at the top left.
- TPS [%] Table:** A table with 11 columns (Speed [km/h] from 20 to 300) and 11 rows (TPS from 10 to 100). All cells contain '0'.
- Left foot braking:** A table with 11 columns (Speed [km/h] from 20 to 300) and 1 row (Brake [%]). All cells contain '0'.
- Brake [%] Table:** A table with 11 columns (Speed [km/h] from 20 to 300) and 1 row (Brake [%]). All cells contain '0'.
- Steering angle [°]:** A section with 'High speed condition' and 'Low speed condition' tables. Both tables have 11 columns (Steering angle from >3 to >21) and 1 row. All cells contain '0'.
- Slip axle [%]:** A section with 'Front' and 'Rear' tables. Both tables have 11 columns (Slip axle from >5 to >50) and 1 row. All cells contain '0'.
- Start program:** A section with 'Speed < [km/h]' (40), 'Lock [%]' (100), and 'Active' checkbox.
- Memory AWD:** A section with a dropdown menu set to 'Map - 1' and a 'Lock/Unlock' checkbox.
- Map 1 Diagram:** A vehicle diagram on the right showing the torque split. The front axle is labeled 'B0' and 'R0', and the rear axle is labeled 'A0'. The diagram shows a central 'G-sensor' and 'Voltage: 0.0 V'.

Note: Maps do not have a constant 25, 50, 75 or 100% torque split between the front and rear wheels. Torque split percentage only indicates which map is selected.

13.LAUNCH CONTROL

The Launch control sequence is a special feature in the AWD TCS that will lock the differential at a user selected preset for maximum grip upon take off.

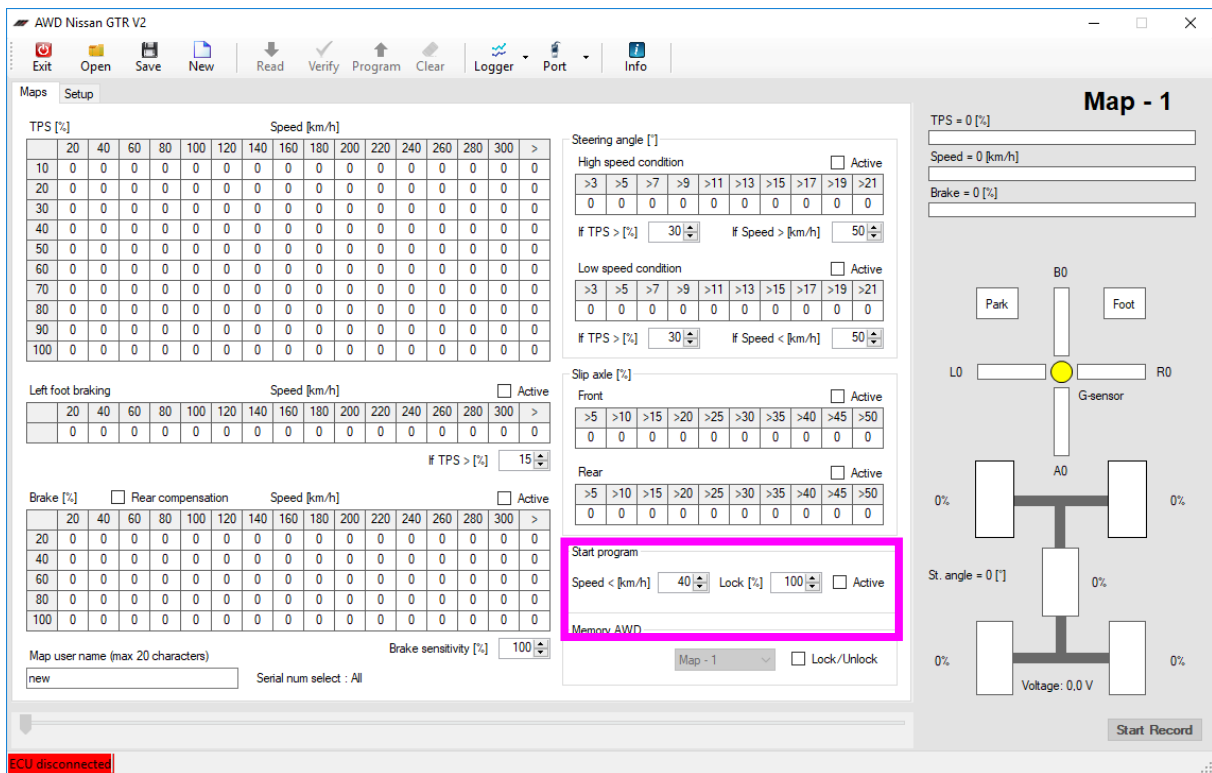
To activate the Launch control, tick the startprogram active box. (Start program is saved on the map only, Each map is tuned individually).

Select the top speed that the start program will deactivate and set the amount of lock that the differential will have during the launch phase.

Program any changes in the software.

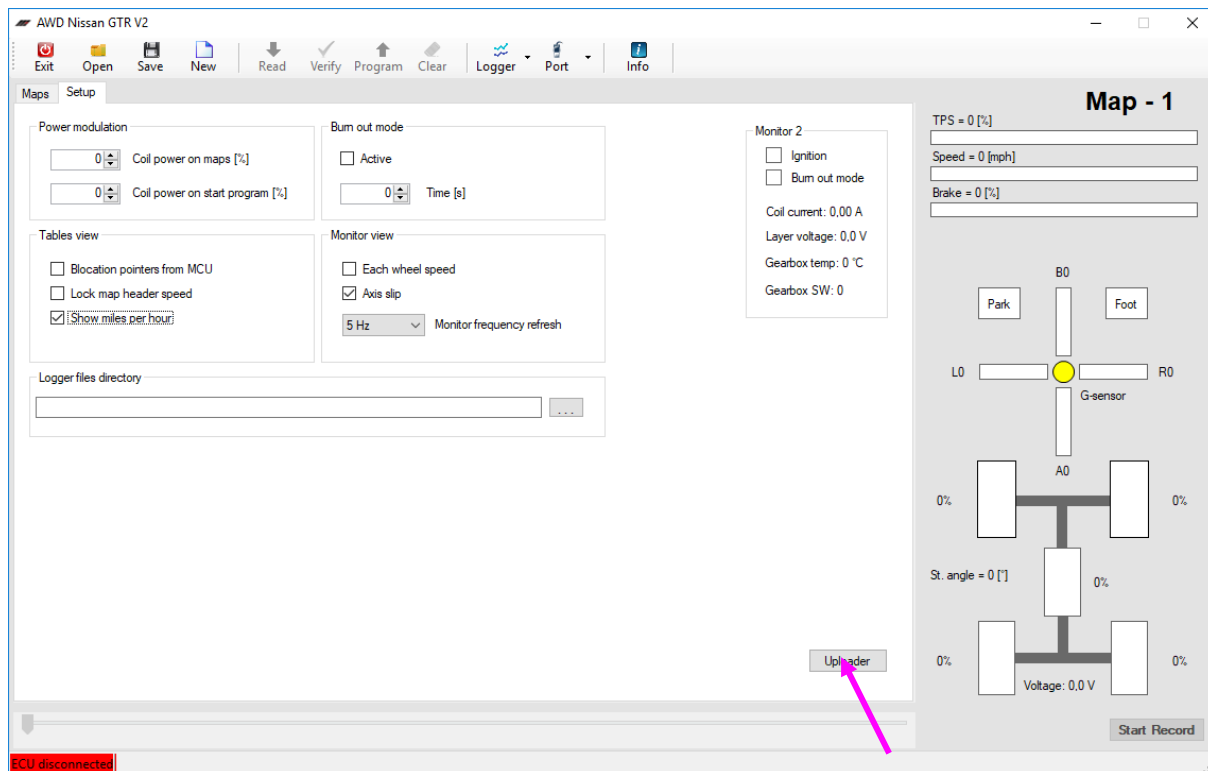
The Launch control is active when the car is stationary (>5kmph) and TPS (throttle) is depressed 80% for approximately 0.5 seconds. The launch control will remain active for 10 seconds if the car remains stationary (>5kmph).

Once the car reaches the programmed speed, launch control sequence will end and revert to the main mapping table. It will also end if the brake is pressed or if the car is cornering.

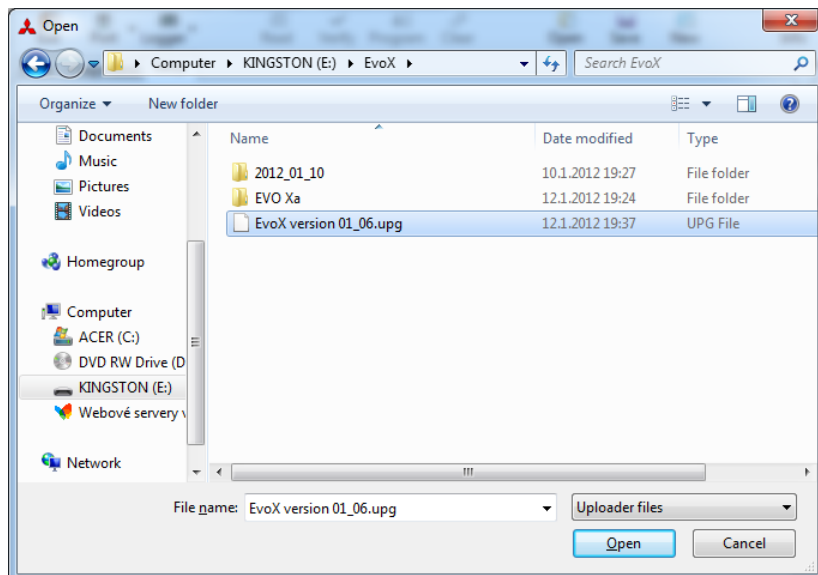


14. UPLOAD OF UPGRADED FIRMWARE

On the setup tab, click the „Uploader“ button.

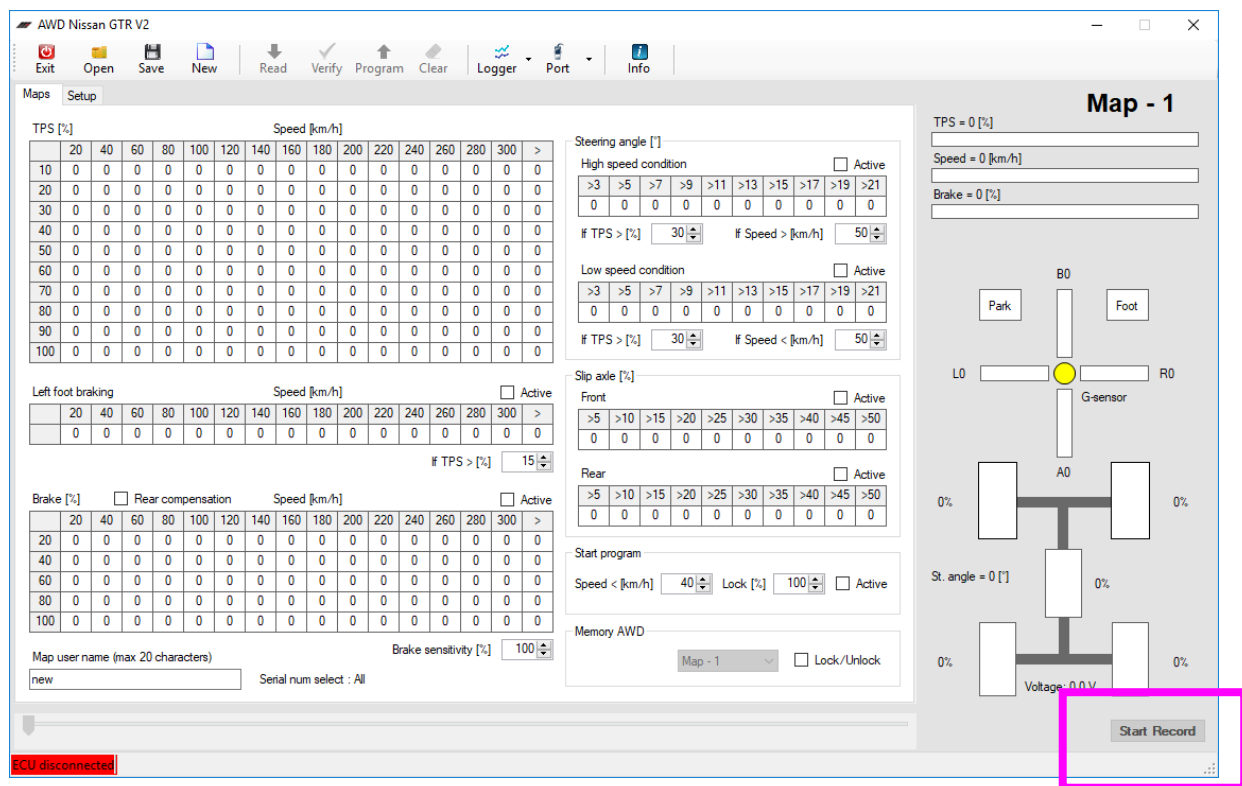


Select the file sent by Kotouc Gearboxes .upg



15. DATALOGGER

The Kotouc Gearboxes GTR AWD TCS has a datalogger functionality when connected to your PC/Notebook via the communication cable.



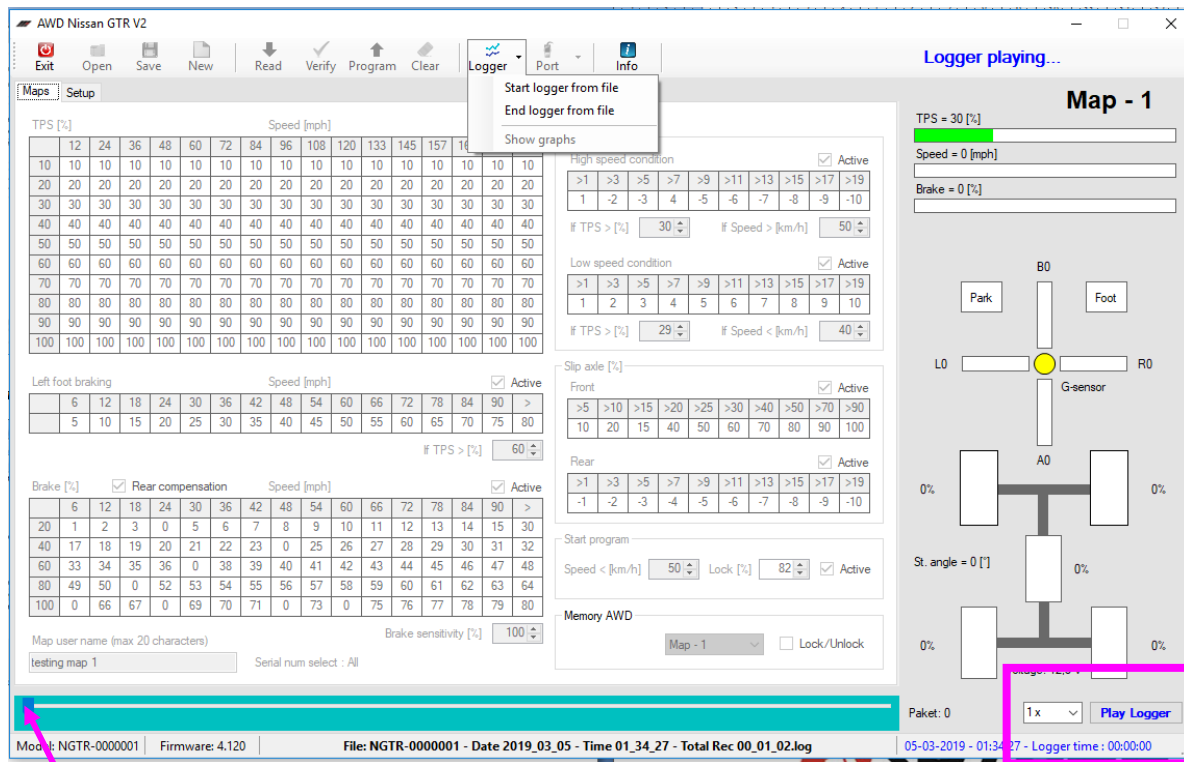
To activate the datalogger, press START RECORD. All the sensors of the traction control system will be recorded for playback.

Press STOP dogger when finished.

The frequency of record is via the Monitor Frequency Refresh rate located on the setup to band explained in section 10.

To play a recorded log file, select the LOGGER drop down box and choose START LOGGER FROM FILE.

When the dialogue box opens, choose the .log file you wish to review.



When a log is open, you can choose to PLAY the file at various speeds from the drop down box.

Alternatively, you can drag the play bar from left to right.

Time stamp and record information are located in the status bar.

To revert back to the active maps, choose LOGGER and END LOGGER FROM FILE.

