

Spitronics ECU - Tune Selection - Guide

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The Tune Selection function allows the ECU to operate with more than one Tune and to select the required Tune according to the installation and application.

Different Tunes can be used to provide different engine characteristics without changing the basic ECU hardware or sensor calibration.

Typical applications include:

- Economy Tune.
- Normal road Tune.
- Performance Tune.
- Racing Tune.
- Reduced-power Tune.
- Different fuel or ignition strategies.
- Different application-specific operating modes.

Where supported, the currently operating Tune is displayed as Active Tune in RealTime Data.

Terminology

Older Spitronics systems used the term **Map** for a stored engine calibration.

This became confusing because **MAP** is also the standard abbreviation for the **Manifold Absolute Pressure Sensor**.

Current Spitronics documentation therefore uses the term **Tune** instead.

In older software or documentation, references such as **Map 1**, **Map 2** or **Map Selection** should be understood as the equivalent of **Tune 1**, **Tune 2** and **Tune Selection**.

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Tune vs Calibration

A Tune contains the adjustable engine operating information used by the ECU.

Depending on the firmware and application, different Tunes may contain different:

- Fuel settings.
- Ignition timing.
- Compensation.
- Limits.
- Feature settings.
- Tuning Graphs.
- Matrix values.

Changing Tune is therefore different from recalibrating sensors or changing the ECU hardware configuration.

Sensor calibration and Critical Settings normally remain associated with the Device configuration rather than being used as a driver-selectable Tune change.

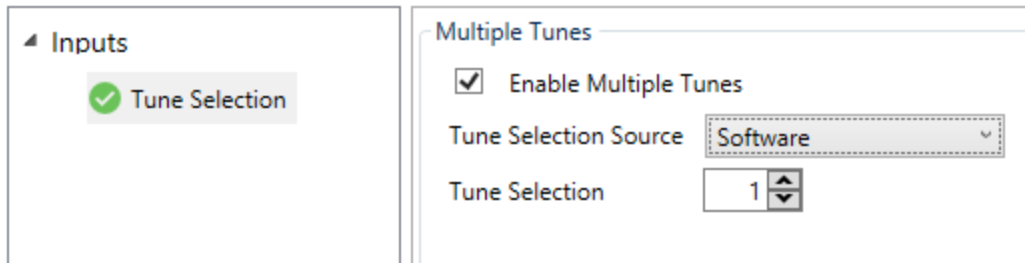
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Multiple Tunes

Where supported by the firmware, Multiple Tunes can be enabled.

When Multiple Tunes are not required, the function can remain disabled.

This simplifies the installation and prevents unintended Tune selection.



Typical software functions may include:

- Enable Multiple Tunes.
- Tune Selection.
- Active Tune indication.

The exact options depend on firmware and Product generation.

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Active Tune

The currently operating Tune should be confirmed in RealTime Data where this information is available.



Active Tune shows which Tune is currently controlling the engine.

This is especially useful because the Tune may change while another software page is open.

When testing Tune Selection, always verify:

Selection Input → Active Tune

rather than assuming that the physical switch position automatically proves which Tune is active.

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Tune 1 and Tune 2

A common ECU installation uses two Tunes:

- Tune 1.
- Tune 2.

The Tunes may be selected by a physical switch or another supported selection method.

A simple example is:

Switch Open → Tune 1

Switch Closed → Tune 2

The actual electrical logic may depend on the firmware and Device input configuration.

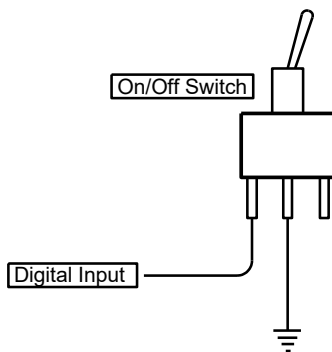
Always confirm the result using **Active Tune** or the applicable Realtime indication.

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Tune Selection Switch

A physical Tune Selection Switch is normally a simple two-position switch connected to the applicable ECU input.

The switch allows the driver or tuner to select between available Tunes without connecting the PC.



The switch should:

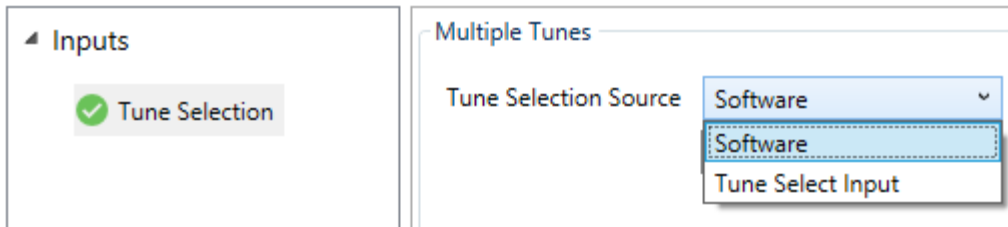
- Make a reliable electrical connection.
- Be mounted where it cannot be changed accidentally.
- Be clearly identified where different Tunes significantly change vehicle behaviour.

The Product wiring documentation provides the applicable input pin and physical connector information.

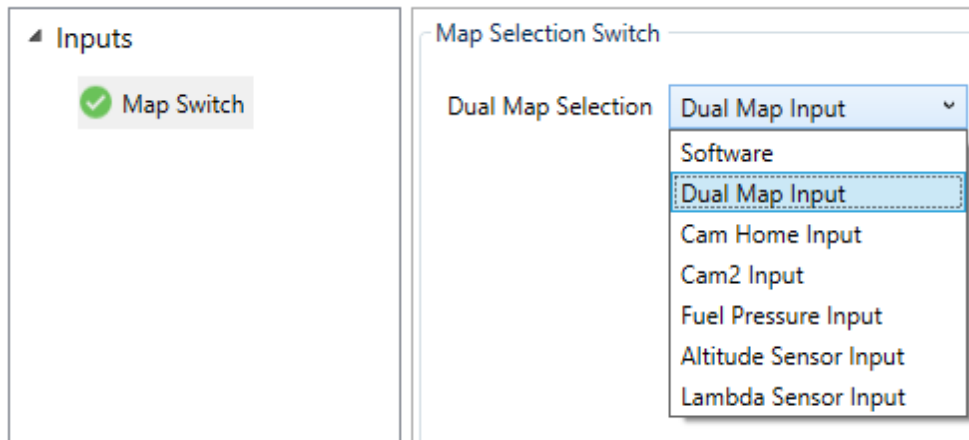
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Tune Selection Input

On some ECU firmware, Tune Selection uses a dedicated input.



On other firmware, the input may be shared with additional functions.



This distinction is important because a shared input may not always behave as a simple live Tune Selection Switch.

Before wiring the switch, confirm:

- Firmware supports Multiple Tunes.
- Correct input is used.
- Input is not required by another higher-priority function.
- The intended Tune-selection method is supported.

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Live Tune Selection

Where Tune Selection has a suitable dedicated input and the firmware supports live switching, the active Tune can be changed while the engine is running.

The ECU changes from the current Tune to the newly selected Tune without requiring the engine to be restarted.

This allows the driver or tuner to change operating characteristics while the vehicle is in use.

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Changing Tunes While Running

When the Tune is changed, the ECU begins using the settings associated with the newly selected Tune.

This can result in an immediate change in:

- Fuel delivery.
- Ignition timing.
- Engine response.
- Boost-related behaviour where applicable.
- Limits.
- Other Tune-dependent functions.

The change may therefore be noticeable immediately.

Important

Do not make the first Tune-change test:

- In traffic.
- During hard acceleration.
- While cornering.
- Under unstable traction conditions.
- In any situation where an unexpected change in engine response may create a hazard.

Perform initial testing under controlled conditions.

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Shared Digital Switch

On some ECU firmware the Tune Selection function shares a Digital Switch input with other functions.

This allows one physical input to perform different duties depending on the firmware configuration.

Functions that may share this input include:

- RapidFire.
- Flat Shift.
- Tune Selection.
- Transmission-related functions on applicable systems.

The firmware determines which function has priority.

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Shared Input Priority

Where these functions share the same Digital Switch input, the current ECU logic uses the priority:

RapidFire → Flat Shift → Dual Tune → ECU functions

A higher-priority enabled function may therefore take control of the input.

This means that enabling Tune Selection does not automatically guarantee that the switch remains available as a live Tune-change input.

If a higher-priority function uses the same input, Tune Selection may instead be determined during startup.

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Startup Tune Selection

When the Digital Switch is shared with a higher-priority function, the ECU may use the switch position during startup to determine which Tune should become active.

A typical arrangement is:

Switch / Button Released during startup → Tune 1

Switch / Button Pressed during startup → Tune 2

Once the engine is running, the shared input can then perform its higher-priority function.

For example, the same physical button may be used by RapidFire while the engine is running.

This allows one ECU input to perform two different jobs:

Startup → Tune Selection

Running → Higher-priority feature

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Why Startup Selection Is Used

A shared input cannot reliably perform several independent functions at the same time.

The ECU therefore determines the Tune during the startup sequence and then releases the input for the function that has higher operating priority.

This avoids requiring an additional physical ECU input for Tune Selection on firmware where inputs are limited.

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Dedicated vs Shared Tune Selection

The two arrangements should not be confused.

Dedicated Tune Selection

The switch can normally change the active Tune while the engine is running.

Shared Digital Switch

The switch may select the Tune only during startup.

After startup, the same input may operate:

- RapidFire.
- Flat Shift.
- Another configured function.

Always confirm the firmware configuration before assuming Tune Selection can be changed while driving.

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Critical Setting

Tune Selection configuration is a **Critical Setting**.

Critical Settings determine major ECU operating and hardware behaviour.

Changing the Tune Selection configuration may change:

- Which physical input is used.
- What that input does.
- Whether another function remains available.
- How the ECU interprets the switch during startup.

For this reason, changing Critical Settings may require the appropriate Device transfer procedure rather than a normal Tune download.

Refer to:

Spitronics ECU - Tune and File Management - Guide

for Download, Clone and Critical Setting behaviour.

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Tune Information

Each Tune should be clearly identified.

Where Tune Information is available, use a meaningful Tune Name.

Examples:

- Road.
- Economy.
- Performance.
- Race.
- Wet.
- Low Boost.
- High Boost.

Avoid vague names such as:

- Tune A.
- New Tune.
- Test 2.
- Copy.

Clear Tune naming reduces the chance of operating or modifying the wrong Tune.

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Different Tunes Should Have a Purpose

Do not create multiple Tunes simply because the firmware allows them.

Each Tune should have a clearly defined purpose.

For example:

Road Tune

- Smooth response.
- Normal RPM limit.
- Conservative ignition timing.

Performance Tune

- More aggressive engine response.
- Different boost or timing strategy where applicable.

Race Tune

- Competition-specific settings.
- Higher operating limits where appropriate.
- Features that may not be suitable for normal road use.

The differences should be understood before the Tune is made available to the driver.

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Tune Selection and Sensor Calibration

Changing Tune should not be used to compensate for incorrect sensor calibration.

Before comparing Tunes, verify that the basic ECU inputs are correct.

Check:

☐ TPS calibration.

☐ MAP operation.

☐ Coolant Temperature.

☐ Air Temperature.

☐ RPM.

☐ Lambda where used.

☐ Other inputs required by the Tune.

A faulty input affects all Tunes and should be corrected before Tune-specific tuning is performed.

When creating a new Tune, copy an existing known-good Tune into the new Tune position and then adjust the required settings. This helps keep the existing calibration and common settings consistent.

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Tune Selection and Engine Protection

Care must be taken when different Tunes contain different engine limits or protection strategies.

For example, one Tune may contain:

- Lower RPM limit.
- Lower boost target.
- More conservative timing.
- Richer high-load fuel.

Another Tune may permit more aggressive operation.

The driver should understand that changing Tune may also change the available protection or operating limits.

Do not assume all Tunes provide identical protection.

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Tune Change During High Load

Avoid deliberately changing Tunes for the first time while the engine is under high load.

Differences between Tunes may include:

- Fuel.
- Timing.
- Boost-related control.
- Engine limits.

Initial Tune-change verification should preferably be performed:

1. At idle.
2. At light load.
3. Under controlled driving conditions.
4. At higher load only after both Tunes have been individually verified.

This makes abnormal behaviour easier to identify safely.

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Realtime Verification

With the ECU connected to the software:

1. Open the applicable Realtime Data.
2. Locate **Active Tune** or the current Tune indication.
3. Operate the Tune Selection Switch.
4. Confirm that the displayed Tune changes as expected.

For a startup-selection system:

1. Switch the ECU off.
2. Select the required switch position.
3. Switch the ECU on.
4. Confirm the resulting Active Tune.
5. Repeat with the opposite switch position.

Do not rely only on switch position.

Always verify what the ECU actually selected.

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Testing a Shared Input

Where the switch is shared with another feature, test both functions separately.

Tune Selection Test

1. Disable engine starting if necessary.
2. Set the switch to the Tune 1 position.
3. Power the ECU.
4. Verify Active Tune.
5. Switch ECU off.
6. Select Tune 2.
7. Power ECU again.
8. Verify Active Tune.

Feature Test

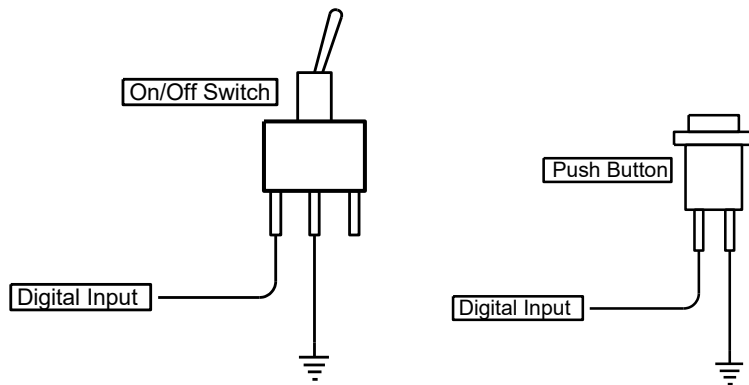
After confirming Tune Selection:

1. Start the engine under controlled conditions.
2. Operate the shared button or switch.
3. Verify that the configured higher-priority function operates correctly.
4. Confirm that the Active Tune does not change unexpectedly.

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Switch Wiring

A typical Tune Selection Switch uses a simple digital input.



The exact wiring depends on:

- ECU Product.
- Firmware.
- Input circuit.
- Shared-function configuration.

Refer to the applicable Product wiring documentation for:

- Connector pin.
- Input name.
- Ground reference.
- Harness wire.
- Electrical input requirements.

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Switch Type

Use a reliable automotive-quality switch.

Suitable types may include:

- Toggle switch.
- Rocker switch.
- Rotary selection switch where supported.
- Momentary button where the firmware specifically uses startup-state selection.

For a simple two-Tune live selection system, a maintained two-position switch is normally easiest for the driver to understand.

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Switch Labelling

Clearly identify the switch positions.

Examples:

ROAD / RACE

LOW / HIGH

TUNE 1 / TUNE 2

Avoid labels such as:

ON / OFF

unless the actual function is clearly understood.

Both switch positions normally represent valid ECU Tunes rather than one position being an ECU OFF state.

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Tune Selection and Android

Where supported, Tune Selection may also be available through an Android or other electronic interface.

The principle remains the same:

- A requested Tune is selected.
- The ECU changes to the applicable Tune.
- Realtime information should confirm the Active Tune.

Do not assume electronic Tune selection is available on every firmware or Product.

Use the applicable software and Product documentation.

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Additional Tune Selection Methods

Depending on the Device and firmware, Tune Selection may use more than a simple two-position physical switch.

Supported selection methods may include:

- More than two Tunes.
- Software selection.
- Android selection.

- Display-based selection.
- CAN-based selection.
- Application-specific automatic selection.

The important principle remains:

The selection method determines which Tune becomes Active.

This guide therefore concentrates on Tune Selection operation rather than defining the function only as a physical switch.

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Troubleshooting

Symptom	Possible Cause	Check
Tune does not change	Multiple Tunes disabled	Check Tune Selection setup
Tune always remains Tune 1	Switch wiring open	Check input and Ground
Tune always remains Tune 2	Input permanently active	Check switch and wiring
Switch works only at startup	Input shared with higher-priority function	Check firmware configuration
Tune changes at startup but not while running	Startup-selection mode operating correctly	Check shared input priority
RapidFire stops working	Tune Selection incorrectly configured on shared input	Check function priority
Wrong Tune active after starting	Switch position incorrect during startup	Verify Active Tune
Active Tune changes unexpectedly	Faulty switch or wiring	Monitor input
Vehicle response changes sharply	Large difference between Tunes	Compare Tune settings
Tune change seems to do nothing	Tunes contain similar settings	Compare Tune contents
ECU behaviour differs after Clone Critical Settings copied		Check Tune Selection configuration

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Tune Does Not Change

If the Tune does not change:

1. Confirm Multiple Tunes are enabled.
2. Confirm the firmware supports the required number of Tunes.
3. Verify switch wiring.
4. Verify the Digital Switch input changes state.
5. Check whether another function has higher priority.
6. Confirm whether selection is live or startup-only.
7. Watch Active Tune in RealTime Data.

Do not replace the ECU or rewrite the Tunes before confirming the selection input itself.

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Wrong Tune at Startup

If the ECU starts on the wrong Tune:

Check:

- Switch position before ignition was switched on.
- Switch wiring.
- Input state.
- Shared-function configuration.
- Critical Settings.
- Active Tune indication.

Where startup selection is used, changing the switch after startup may not change the currently active Tune.

Cycle ECU power and retest.

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Tune Changes Unexpectedly

An unexpected Tune change must be investigated.

Possible causes include:

- Loose switch terminal.
- Damaged wiring.
- Poor Ground.
- Incorrect shared-input configuration.
- Electronic selection source.
- Faulty switch.

A Tune Selection input should remain electrically stable.

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Initial Setup Procedure

For a new Tune Selection installation:

1. Confirm firmware supports Multiple Tunes.
2. Enable Multiple Tunes.
3. Identify the intended selection method.
4. Determine whether the input is dedicated or shared.
5. Configure the applicable Critical Setting.
6. Wire the Tune Selection Switch.
7. Name the available Tunes clearly.
8. Verify Tune 1.
9. Verify Tune 2.
10. Confirm Active Tune in Realtime.
11. Test startup selection where applicable.
12. Test shared-input functions where applicable.
13. Compare Tune behaviour under controlled conditions.

14. Only then allow normal vehicle use.

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Safety

Tune Selection can immediately change engine behaviour.

Different Tunes may contain different:

- Fuel settings.
- Ignition timing.
- Engine limits.
- Boost-related settings.
- Throttle or response behaviour where applicable.

Therefore:

- Do not test an unknown Tune for the first time in traffic.
- Verify each Tune individually.
- Verify the selected Tune before high-load operation.
- Clearly label driver-accessible Tune switches.
- Do not use Tune Selection to hide a mechanical or tuning fault.
- Do not assume both Tunes contain the same engine-protection settings.

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Setup Check

Before considering Tune Selection complete, verify:

- ☐ Multiple Tunes are enabled where required.
- ☐ Tune 1 has been correctly configured.
- ☐ Tune 2 has been correctly configured.
- ☐ Tunes have meaningful names.
- ☐ Tune Selection input is correctly configured.
- ☐ Critical Setting has been transferred correctly.
- ☐ Switch wiring is correct.
- ☐ Switch positions are clearly labelled.
- ☐ Dedicated or shared-input operation is understood.

- ☐ Shared-input priority has been checked.
- ☐ Startup Tune Selection works where applicable.
- ☐ Live Tune Selection works where applicable.
- ☐ Active Tune confirms the selected Tune.
- ☐ Higher-priority shared functions still operate correctly.
- ☐ Both Tunes have been individually tested.
- ☐ Tune changes have been tested under controlled conditions.
- ☐ Driver understands the purpose of each Tune.

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