



Flatcap Engineering Ltd 2024

## Cruise Control Fitting Instructions M57 Swap/Standalone – DDE5



Cruise Module with universal stalk

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# Basic Module Information

Before installing the cruise control module there are a few things you should know. Firstly, the module has been designed and tested ultimately with safety in mind. It is imperative that you install all of the deactivation methods such as brake switches, clutch switch etc, before or during installation. Without these signals, the module will not function at all, so it is extremely important that they are connected, and without fault before continuing with any fault diagnosis.

Secondly, the module has undergone countless hours of testing and improvement, to get as close to an OEM feel as possible. Dependant on the vehicle you are fitting it in, drivetrain backlash and overall setup of the car may sometimes cause small noticeable oscillations when going over bumps however, this is very rare.

Please read the parts of the guide that are relevant to the configuration of module you have purchased – each module is coded and, in some cases, wired differently.

If you have any queries, or are not sure at any point of the installation, please email us, and we will endeavour to reply as soon as possible.

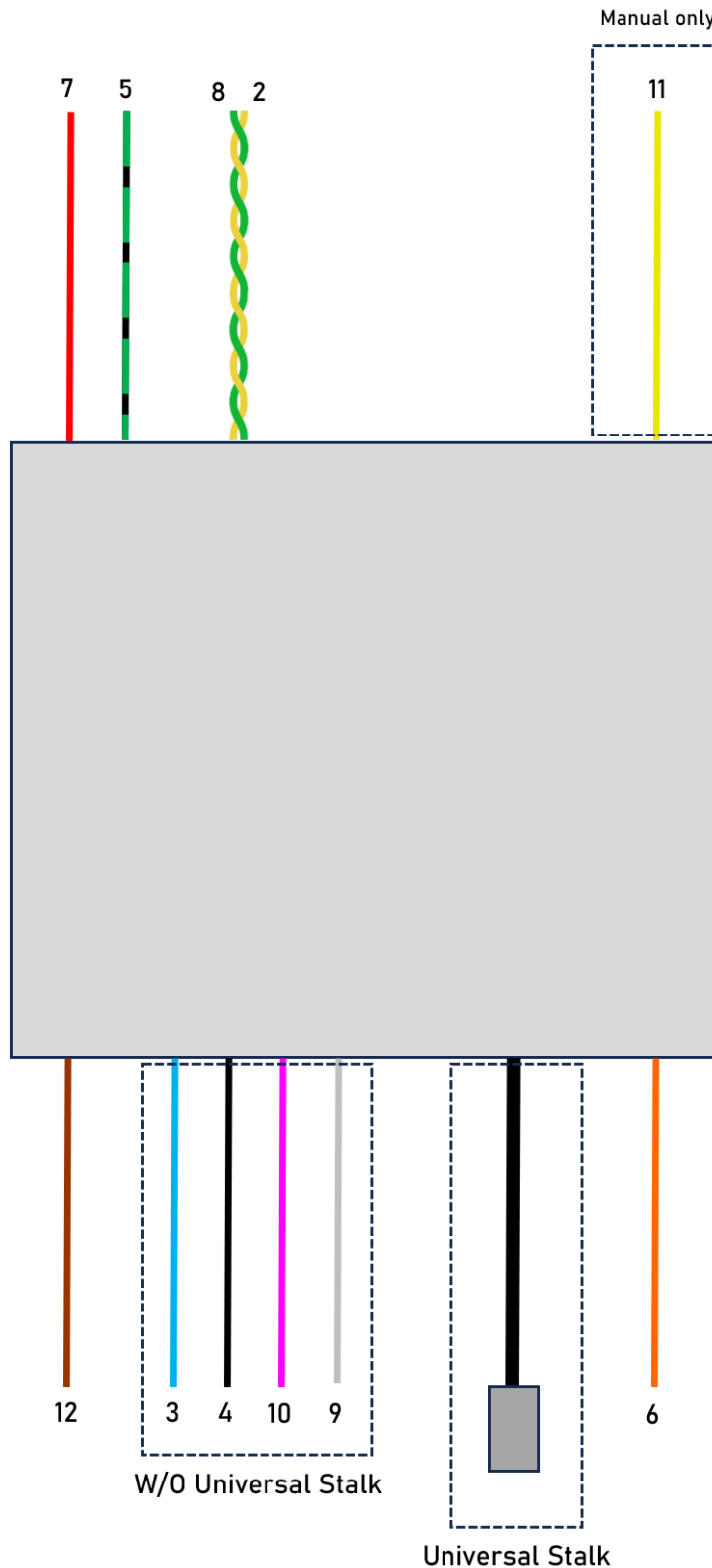
Below is a table of the wiring colours, and their intended connection points:

| Wire Colour               | Function               | Connect to              |
|---------------------------|------------------------|-------------------------|
| Red                       | Permanent live         | Fused 5A battery feed   |
| Green/Black               | Ignition live          | Ignition live feed      |
| Green/Yellow Twisted Pair | CANBUS                 | CAN Network             |
| Yellow                    | Speed Signal           | Pulse signal (manual)   |
| Brown                     | Ground                 | Solid ground connection |
| Orange                    | Cruise active          | LED                     |
| Purple                    | Button Signal          | ECU                     |
| Blue                      | On/Off switch          | Momentary switch        |
| Black                     | Reduce speed (-)       | Momentary switch        |
| Pink                      | Set/Increase speed (+) | Momentary switch        |
| Grey                      | Resume speed           | Momentary switch        |

The highlighted boxes are only a requirement if you do not have the universal stalk, details of how to connect this on page 6.

# Wiring Schematic

Below is a basic wiring schematic overview for the module. There are more in depth diagrams throughout the instructions which explain each part in more detail.



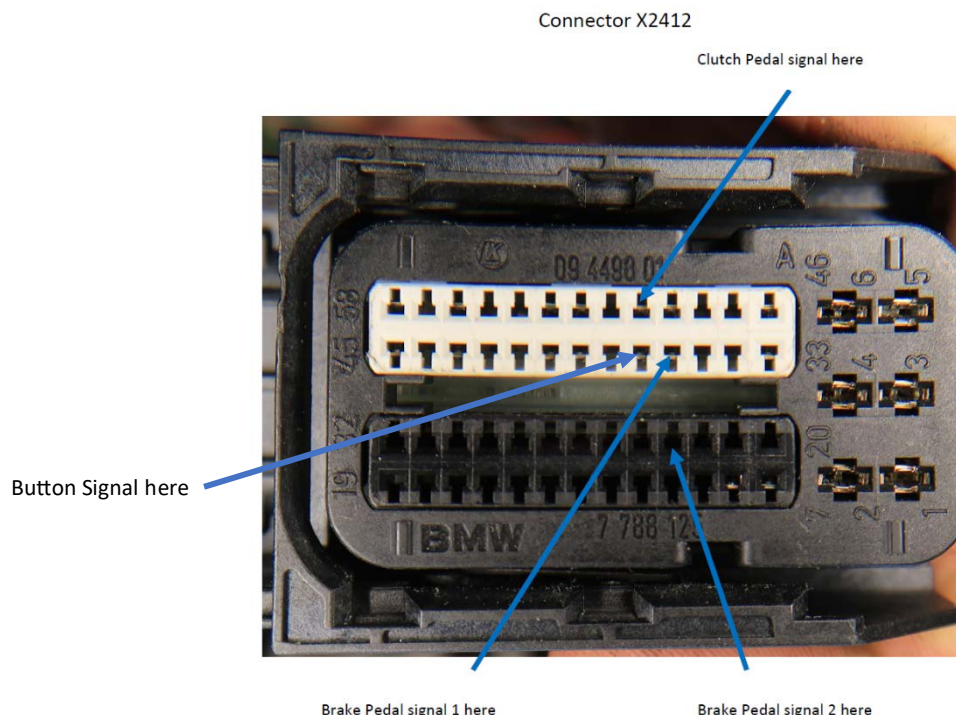
## Signal Requirements

The cruise control module requires that the brake and clutch switch signals are operative before use. They are quite simple to connect, if you have not done so already, using the below guide. If you have already done this, you can skip this step.

The brake switches consist of a pair of signals, for redundancy purposes. One of these signals is normally open (NO), and one is normally closed (NC). To facilitate this, we sell a brake switch signal converter, which you can get at a discounted rate when purchasing with the cruise control module. This effectively converts the pair of signals, into one NO signal. In laments terms, supplying this module with a feed from the brake lights (+12v) will create both of the brake signals required. The brake switch signal converter needs to be connected to the ECU, on pins 23, and 36. It does not matter which of the 2 wires is connected to the ECU pins – any orientation will produce the same results.

The clutch switch for manuals needs to be connected to pin 50. The BMW ECU requires that this signal is of normally closed (NC) type; meaning that when the clutch pedal is in a resting state, the signal on pin 50 will be connected to ground. Most vehicles from 2005- onwards have clutch switches, but it is worth verifying first whether it is a normally open, or normally closed contact type. If it is normally open, a 5 pin relay with normally closed contact can be used to reverse the direction of the signal. Alternatively, a switch with a normally closed contact can be fitted, actuated by the clutch pedal.

The purple wire from the cruise module contains the signal for the buttons, that the ECU interprets to know what button is being pressed. It should be connected to pin 37 of the ECU connector.



# Connection Guide

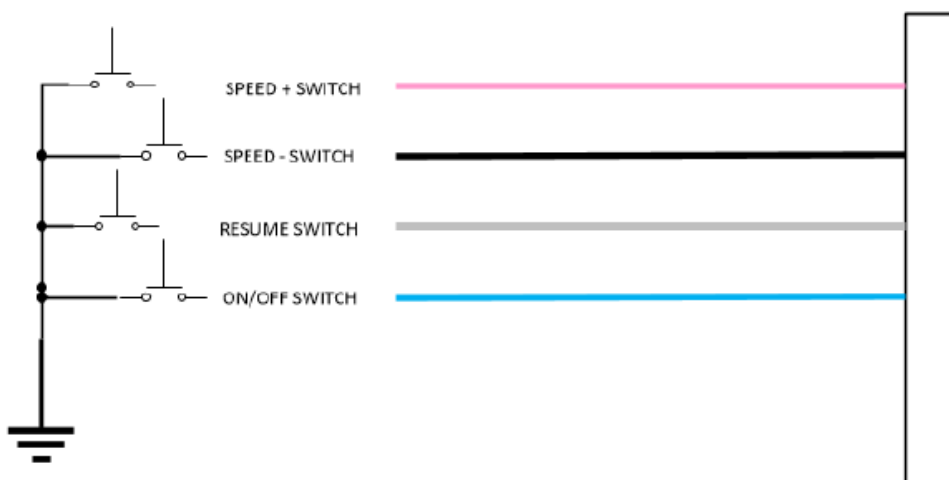
Connection of the module is very simple. Connect power, ignition live, and ground connections. A permanent feed is required, as the module has an internal relay. The module will remain active for between 60-90 seconds from IGN off.

Connect CANbus wires. Please see detailed information on page 7 regarding connection of the CANbus.

For manual gearboxes, it is necessary to connect the yellow wire to a pulsed speed signal. The signal should be 0-12v, 8000 pulses per mile. If your sensor does not produce 8000 pulses per mile, it is possible to purchase devices to correct this, sometimes called speedometer correction devices.

Connect the 4 button signals. No buttons are supplied with the kit due to the vast number of options available, specific to each user's placement and needs. Buttons that are suitable for this module can be purchased from several online stores, RS Components, Amazon, and Farnell to name a few. Any buttons used should be of momentary type, with a normally open (NO) contact.

All of the 4 button signals can either be switch to ground, or 12v switching. **ONLY** connect the buttons in the configuration as your module has been set. Connecting 12v switching buttons to a module configured for ground switching will not work! If using a module with 12v switching signals, any signal from 1-14v is acceptable. It is worth consulting wiring diagrams if you have factory cruise control switches, as they may be suitable for use with the module. Below is a diagram showing the connection of ground switching buttons. For 12v switching buttons, they can be supplied by an ignition live, or a feed from your existing controls.



## Connection Guide – Universal Stalk

Connection of the module is very simple. Connect power, ignition live, and ground connections. A permanent feed is required, as the module has an internal relay. The module will remain active for between 60-90 seconds from IGN off.

Connect CANbus wires. Please see detailed information on page 7 regarding connection of the CANbus.

For manual gearboxes, it is necessary to connect the yellow wire to a pulsed speed signal. The signal should be 0-12v, 8000 pulses per mile. If your sensor does not produce 8000 pulses per mile, it is possible to purchase devices to correct this, sometimes called speedometer correction devices.

With the universal stalk, you lose the reduce speed (-) function, as there are only 3 buttons available. However, it provides a much more OEM look. Details of how the stalk operates can be found on page 8.

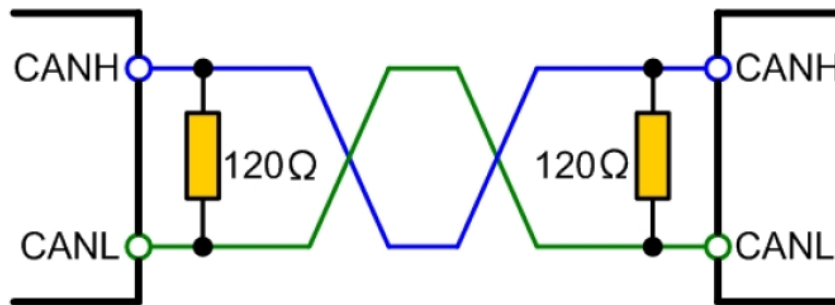
The stalk is supplied with a 6 pin Deutsch connector. Select a suitable location for the stalk, drill the hole, and fit the stalk. Once the stalk is fitted in the location you want, the connector can be fitted to the pins on the stalk wiring. The Deutsch connector has clear numbers on the rear of the body. Please use the table below to match up each wire colour from the stalk to the correct location on the plug. Push the wires in through the elastomer seal. It may be necessary to use a small pair of needle nose pliers to gently pull the pins through from the front side of the connector. There will be an audible click as the pins lock into place. Once all pins are installed, install the orange wedgelock provided. Slide the heatshrink over the wires, and shrink. The stalk can now be connected to the mating connector on the cruise module loom.

|       |        |
|-------|--------|
| Pin 1 | Blue   |
| Pin 2 | Brown  |
| Pin 3 | Green  |
| Pin 4 | Yellow |
| Pin 5 | Black  |
| Pin 6 | Red    |



## CANBUS Connection

Connecting to the CANbus is quite easy, but it is worth noting a few things before doing so. Assuming you are connecting the cruise module into a running and driving conversion, the CANbus should be fully operational already, so no extra resistors will need to be added. The cruise module does not have a CAN terminating resistor. The schematic of the CANbus layout is shown below:



\*Colours shown here are for illustration purposes only and do not reflect the colours of the wiring in the kit.

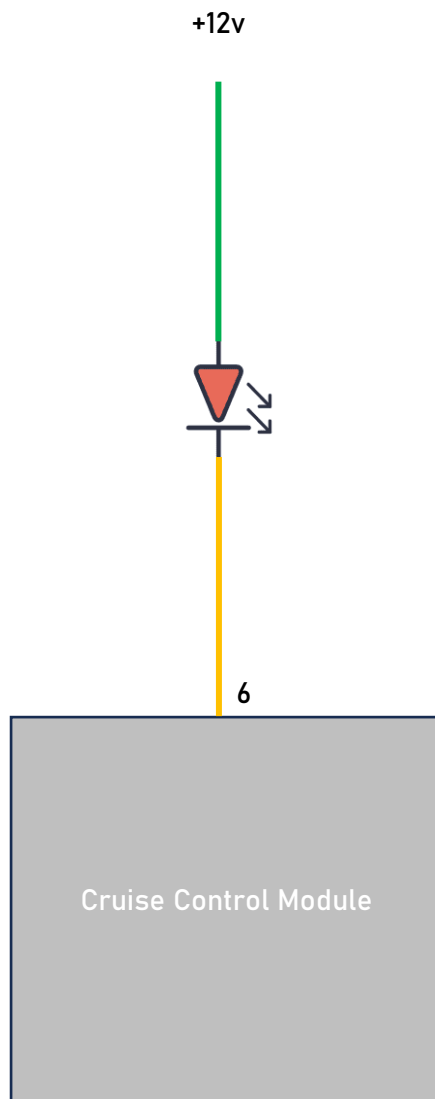
When connecting into the bus, ensure the connections are suitably crimped/soldered. We do not recommend using insulated crimp terminals, as these can become loose and provide a bad connection, potentially bringing the whole bus into a fault state. Instead, use uninsulated butt crimps, and heatshrink any joints accordingly. It is always worth measuring the resistance of the CAN bus after doing any work, to ensure any changes have not created a fault. With 2 resistors in the network, any point measured with a multimeter across CAN high and low should return a resistance of 60 ohms. If you have 120 ohms, an extra resistor must be added. If you have 40 ohms, a resistor needs to be removed. If you have any other value that is not +/- 1-2 ohms of the above-mentioned values, you need to verify the connections across the entire network. If the resistance is not correct, you will have CAN faults, and the module will not operate.



## Cruise Status LED

The module comes configured with the ability to drive an LED, or any other low side load up to 500mA. On DDE5 ECUs, the ECU acknowledges the state of cruise control on CANbus. The cruise control module interprets this, and will activate the output when the cruise control is in a state of readiness. Similarly, when cruise is turned off, the output will turn off.

Remember that this is a low side signal, which provides a ground source when active. Any load connected greater than 500mA will damage the module.

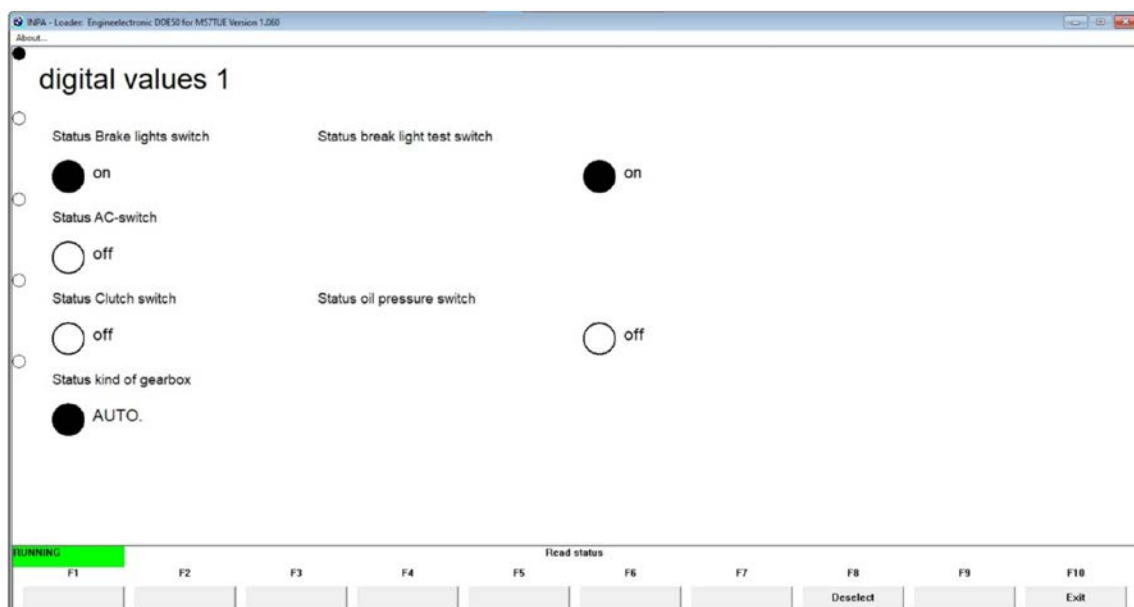


# Testing and Verification

Before test driving it is worth verifying the integrity of the signals, and connections you have made. Use diagnostic equipment, or a laptop with INPA software, to check the status of the brake, and clutch pedal switch signals.

Select the ECU, and status section. When the brake is depressed, both brake light signals should appear “on” simultaneously. If one of these is already lit, or they do not appear at the same time, verify the connections made to the ECU.

Similarly, for the clutch switch on manuals, the clutch switch status should be OFF when the pedal is resting. If this shows ON, it means the wiring is not correctly connected, or the switch is of the incorrect type.



Please also verify the gearbox type as shown at the bottom of the screen. If your ECU is configured for the wrong type, it will not work! Please send your ECU to be reconfigured to the correct gearbox type if this is the case.

Check for errors listed in the ECU fault memory. Several errors for “Botschaft” (message timeout) should no longer be active, and should be cleared. Ensure they don’t return.

# Module Operation

Operation of the module is very simple. Please read carefully below, and follow the relevant instructions:

## Without universal stalk:

1. Turn on the cruise control. Press the ON/OFF button once. The LED output will now become active.
2. Drive to desired speed, and press SET/Increase speed button. The requested speed is set.
3. To cancel, press ON/OFF button once, or brake pedal, or clutch pedal.
4. Pressing the ON/OFF button a second time will deactivate cruise in the ECU, and the LED output will deactivate. Press again to re activate.
5. To reset the last known speed, press reset once. To increase speed whilst on cruise, press and hold SET/Increase. To reduce speed, press reduce speed button (-).

## With universal stalk:

1. To activate cruise, press the ON/OFF button on the end of the stalk once. The LED on the stalk will illuminate.
2. Drive to desired speed, and press SET/COAST button once. The desired speed will now be set.
3. To increase speed, press RES/ACC button once. Each press is +1mph. Long pressing will not increase speed. Press multiple times to increase speed.
4. To cancel, press SET/COAST button again, ON/OFF button, press brake, or clutch pedal.
5. If you use the ON/OFF button to cancel cruise, it is important that you press it again before requesting cruise again. At any time, if the LED on the stalk is not lit, the module will not activate cruise.
6. To reset the last requested speed, press RES/ACC.

## For any module, it is important to note:

- The minimum speed for cruise activation is 25mph.
- If cruise deactivates for any reason whilst driving, it is because one of the many deactivation methods has been triggered. Consult the ECU fault memory if this occurs, and will not reset.
- When the above occurs, it will be necessary to reset the power to the module and engine ECU.
- The module uses the brake and clutch switch signals, provided by the ECU to make decisions on the cruise activation. It is ultimately the ECU that controls these signals, and if it recognises any faults here, these will be passed down to the cruise module.