TC200
Operation & Installation Guide
Revision 1.0

monit
RALLY COMPUTERS

Introduction

Thank you for your purchase of this rally computer product. At monit, we take pride in everything we make, and the TC200 is no exception. Every detail of the product has been designed and manufactured using the latest engineering technology—and the greatest care.

We sincerely hope you will enjoy the use of your new rally computer, and that you will continue to choose monit products as your motorsport career progresses!

Regards, the monit team.

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▶ Installation

Simple instructions for fitting and wiring the
TC200 into your vehicle.

Installation

Before You Start

Installation of the TC200 requires a moderate level of mechanical ability and a basic understanding of electrical systems. If you do not have experience in these areas, we recommend that you employ the services of a qualified automotive technician.

If you do decide to install the unit yourself, please ensure that you read all the instructions carefully before starting.

| ⚠ **Warning**	Monit Limited accepts no liability for any damage to property or persons, whether direct or consequential, as a result of the incorrect installation of the product.

Fitting to the Vehicle

The small size and weight of the TC200 make it easy to mount almost anywhere inside your vehicle. Wherever you put it, ensure that your co-driver can comfortably reach all the buttons while seated, and that the unit cannot come free of its mountings in the event of an accident. If your vehicle has airbags fitted, it is very important that the device is not placed over the covers from which they are deployed. Doing so could result in serious injury.

To simplify attachment to your vehicle, the device has two metal bosses molded into the back part of the case. These accept standard M4 bolts. When mounting, also remember to leave space behind the unit for its electrical connector.

*Mounting
Boss Positions
(not to scale)*

M4

91mm (3.6inch)
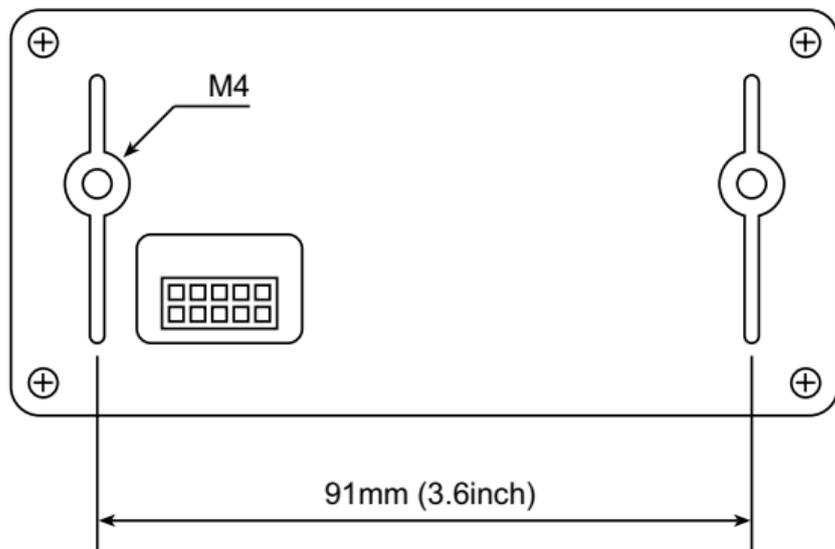
Installation

Electrical Connections

All electrical connections to the device are made through a single connector located on the back of the unit. Included with your TC200 is a pre-wired loom that attaches to this connector, and provides colour coded wires for each signal. The functions associated with each of the wires on this loom are shown in the table on the right.

In its most basic configuration, the unit require only three wires to be attached: the two connections to the battery, and a vehicle speed signal. More complex setups might also use one or more of the auxiliary inputs, a fuel sender signal, or the regulated 5V power supply for active type speed sensors. Whether these are required or not will depend on your vehicle type and setup preferences.

Colour	Description
Red	Battery +12V
Black	Battery Ground
White	Auxiliary A Input
Brown	Auxiliary B Input
Green	Fuel Signal Input
Orange	Sensor +5V Supply
Blue	Speed Signal Input
Yellow	Sensor Ground

When connecting the unit up, ensure that any unused wires on the loom cannot short against each other or the vehicle's chassis.

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Installation

Power Supply

The device should be connected to the vehicle's battery through a 2A fuse as shown on the right. Make sure it is attached to a point in the system where power is always available, even when the ignition is turned off. An external power switch is not required.
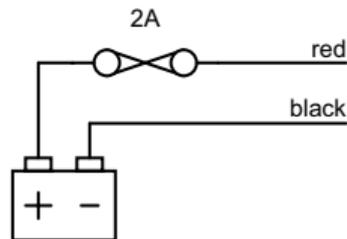
Auxiliary Inputs

The unit includes two auxiliary inputs that can provide short-cuts to common tasks, such as resetting the counters or controlling the stop-watch. If used, these should be connected to user supplied switches as shown on the right. For more information on the setup and operation of this feature, see page C-6.
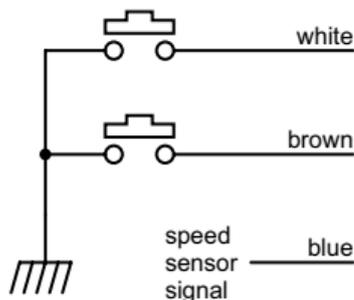
Installation

Vehicle Speed Signal

The most important input to the rally computer is the vehicle's speed signal. If your vehicle has a factory fitted speed sensor, chances are you will be able to connect this directly to the unit. Otherwise, you will have to purchase and install an after-market sensor solution. For more information, contact a monit sales representative to discuss the options for your vehicle.

The type of speed signal accepted by the device is a digital pulse that switches between 0-5V or 0-12V and with a frequency of less than 1kHz. Sensors that produce this type of signal can be connected directly to the unit's blue wire. For sensors that require external power, a regulated 5V power source is available from the orange coloured wire.

Fuel Sender Signal

To use the fuel measurement feature, connect the signal output from your vehicle's fuel sender directly to the green wire on the loom. This input measures the voltage (0-12V) generated by the sender, and will work with signals that either increase or decrease with increasing fuel level. For best results, use a sender that has a output voltage swing of at least 6V between empty and full.

The presence of the TC200 should not significantly affect the operation of an existing fuel gauge. However, if you remove the factory fuel gauge from your vehicle, you will need to fit an equivalent resistor in its place to ensure the fuel sender continues to work properly.

Tidying Up

Before you power the unit up for the first time, check that all your electrical connections are correct and securely made. Also make sure that any exposed wires in the circuit are covered with insulation tape or heat-shrink.

▶ **Getting Started**

Basic setup and operating information to
get you up and running quickly.

Getting Started

Overview

If you have ever used a mobile phone or MP3 player device, you should find the TC200's user interface quite familiar. But if not don't despair—the TC200 has been designed with you in mind. Just take the time to read through this section and discover for yourself how easy to use it is.

Turning On & Off

The device enters a low power sleep state after five minutes of inactivity. To start the unit up again, press any of the buttons or begin driving the vehicle.

User Interface Basics

The device's user interface consists of the liquid crystal display and the four buttons

that surround it. Like many modern devices, these buttons do not have dedicated functions assigned to them. Instead, the tasks they perform change depending on where in the menu system you are. The task that is currently assigned to a particular button is shown on the screen by a text label, as can be seen below. The four labels are inside the dark bars on the right and left edges of the screen.

Remember to always read these labels, as they are there to guide you through the menu system.
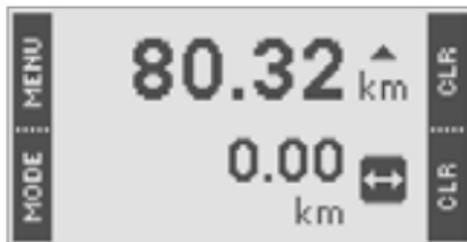
Telemetry Screen

The first screen to appear on the display when you power the device up is the Telemetry Screen. It can be seen in the image on the right. This screen displays the vehicle's distance, speed, timing and fuel information and, as you might expect, is the one you will use the majority of the time during an event.

Telemetry Screen (kms)

Functionally, the screen is split vertically into two display areas. The upper half of the screen always contains the Interval Distance counter which can be cleared instantly by pressing the top-right CLR button. This counter is typically used to measure the distance between junctions, landmarks, or other road book instructions.
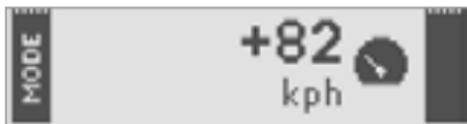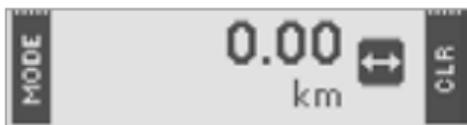
The lower half of the screen is used to view the various other telemetry sources available on the TC200. If enabled, these can be cycled through by pressing the MODE button. For more information on enabling and disabling sources, refer to page C-2.

Getting Started

The first screen-shot on the left shows the Total Distance counter. This works independently from the Interval counter and is typically used to measure the distance since the start of a stage, day or event. When selected, it can be cleared by pressing the bottom-right CLR button for one second.

The next three screen-shots show the Current , Average and Maximum Speed readouts respectively. When either of the latter two are visible, they can be cleared at any time by pressing the bottom-right CLR button for one second.

The maximum speed value will be stored even when power is removed.

The next screen-shot shows the built in stop-watch. When selected, this can be started and stopped by pressing the bottom-right button. It can be reset by holding down the same button for one second.

The last screen-shot shows the time of day clock. This shows the current time in 24 hour format to the nearest second. To change the time, press the bottom-right SET button. For more information on this feature, see page C-3.

Note: If any of these sources do not appear on your unit's display, it is because that source is currently disabled. See page C-2 for details on how to enabled it, or to disable a source you do not require.

Getting Started

Menu System

Using the menu system you can quickly change settings and access the device's more advanced features. To exit the Telemetry Screen and enter the menu system, press the MENU button.

The main menu consists of a set of six icon, one for each of the six menu categories. To cycle through these use the LEFT or RIGHT buttons. When the desired category is highlighted, press the OK button to bring up the associated menu. These can then be navigated in a similar way.

To return to the Telemetry Screen at any time, press the top-left BACK button.

Calibration

Settings

Fuel Gauge

Performance

About

Set Distance

Distance Calibration

Once you have finished installation of the rally computer, you will need to calibrate it to ensure it works accurately. Fortunately this is very easy to do. With the unit powered up, navigate to the Calibration menu and select 'Cal. Distance'. In the distance calibration sub-menu that appears, select 'Calibrate'. This will start an automatic calibration wizard that will guide you through each step of the process.

All you need to perform the calibration is a section of road with an accurately known distance. For best results choose any distance of between 1 and 99km. When the process is completed, the unit will retain its calibration, even if power is removed.
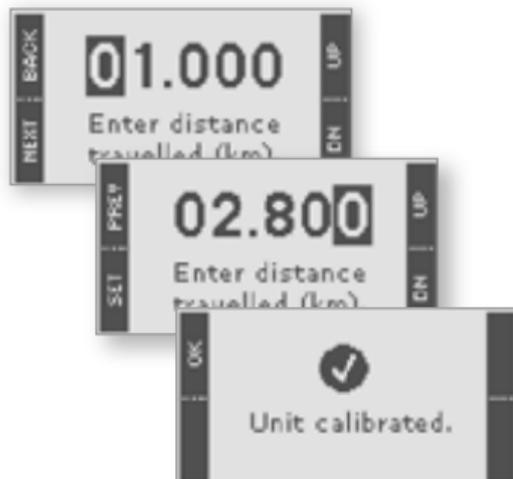
Getting Started

When the wizard is started, the first screen to appear will instruct you to drive to the start of your known distance. Press the OK button when this has been reached. Continue to drive until you are at the end of the known distance, then press OK again. A data entry screen will now appear prompting you to enter the distance you have travelled.

The data entry screen (shown right) works by allowing you to enter each digit individually. The digit that is currently being modified is shown highlighted and can be adjusted using the UP and DN buttons. Once you have set it to the desired value, press the NEXT button to move the highlight to the adjacent digit. When all the digits have been entered, the NEXT button will change to say SET. Press this to confirm the value and complete the calibration process.

Fuel Calibration

To calibrate the fuel system, navigate to the Calibration menu, and select the 'Cal. Fuel' item. This will start the fuel calibration wizard that will guide you through the process.

For detailed instruction on setting up the fuel system, please refer to the separate Fuel Calibration Guide which should have been included with your rally computer.

Getting Started

Dimming the Backlight

The TC200 has a very bright white LED backlight. In daytime and low light conditions this substantially improves the visibility of the display. However, at night, this intense light may be distracting. To reduce its intensity hold down the MENU button in the Telemetry Screen for one second. Repeating this will return it to full brightness.

Changing the Display Units

The TC200 works in miles, kilometres, US gallons and litres. To change these options, navigate to the Settings menu and select the 'Units' item. This will bring up a sub-menu that will allow you to change the fuel and distance units individually.

Changing the Display Resolution

The distance counters usually show a resolution of ten metres. If you require a higher level of accuracy this can be increased to one metre. To do this, navigate to the Settings menu and select the 'Advanced' item. In the sub-menu that appears, select the 'Resolution' item. This will toggle between the two available levels.

Setting the Counting Direction

The distance counters can be configured to count either up or down. To change the direction, navigate to the Settings menu and select the 'Advanced' item. In the sub-menu that appears, select the 'Counting' item. This will toggle the direction setting.

▶ **Advanced Features**

Detailed information about the TC200's
more powerful features.

Advanced Features

### Telemetry Sources

There are seven different telemetry sources that can be displayed in the lower half of the Telemetry Screen. Because of this large number, the display can very quickly become cluttered. To prevent this, the TC200 allows you to select which sources you wish to display.

To do this, navigate to the Settings menu and select the 'Telemetry' item. The sub-menu that appears contains a list of all the available sources. To disable or enable a source, highlight it, and then press the OK button. This will toggle it between the 'on' and 'off' state.

Note: A telemetry source continues to operate in the background even when not visible.
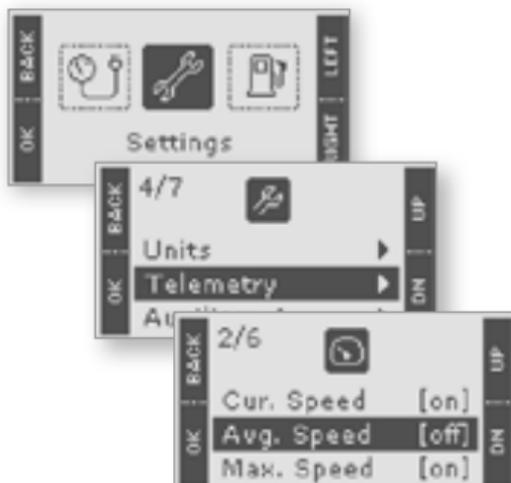
Advanced Features

Adjusting the Clock

The TC200 includes a time of day clock that can be used to keep track of official rally time during an event. When in the Telemetry Screen, and with the Clock visible, you can adjust the time by pressing the SET button. This will bring up the Adjust Time screen.

The screen works by allowing you to adjust each digit individually. The digit that is currently being modified is shown highlighted and can be adjusted using the UP and DN buttons. Once you have set it to the desired value, press the NEXT button to move the highlight to the adjacent digit. When all the digits have been entered, the NEXT button will change to say SET. Press this to confirm the new value, and update the time.
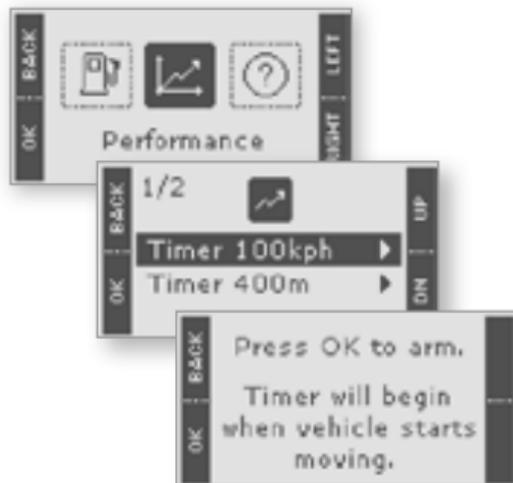
Advanced Features

Sprint Timer

The built in sprint timer can be used to accurately measure your vehicle's 0-100kph (0-60mph) and 0-400m (1/4mile) times. It can be accessed from the Performance menu. To use the timers, bring the vehicle to a halt and follow the on-screen instructions to arm the system. Once this is done, the selected timer will start automatically when it detects movement, so simply begin accelerating when ready. Upon reaching the target speed or distance, the timer will stop and display the acquired sprint time.

Presetting a Distance

In some situations you may wish to preset one of the distance counters to a particular initial value. To do this, navigate to the Set Distance menu and select the name of the counter you want to preset. The display will then show a data entry screen that will prompt you for a new value.

The data entry screen works by allowing you to enter each of the new value's digits individually. The digit that is currently being modified is shown highlighted and can be adjusted using the UP and DN buttons. Once you have set it to the desired value, press the NEXT button to move the highlight to the adjacent digit. When all the digits have been entered, the NEXT button will change to say SET. Press this to complete the process.

Advanced Features

Auxiliary Inputs

Many co-drivers like to connect foot-pedals or handheld switches to their rally computers so they can quickly perform commonly used functions. The TC200 allows for this through the provision of two auxiliary inputs. These can be connected to external switches and configured in software to perform particular tasks when activated. The list of available tasks is shown on the next page.

To assign a task to one of the inputs, navigate to the Settings menu and select either the 'Auxiliary A' or 'Auxiliary B' item. This will bring up a list of the available tasks, with the currently selected one marked by a small arrow. To change the assignment, move the highlight to the desired task and press OK. Both inputs may be assigned to the same task.

Task	Switch Type	Description
None	None	Auxiliary input not used.
Clear Interval	Momentary	Clear Interval Distance counter.
Clear Total	Momentary	Clear Total Distance counter.
Freeze	Momentary	Toggles freeze (also called split) mode on and off. This feature halts updates of the Telemetry Screen, while the counters continue to operate in the background.
Stopwatch	Momentary	Starts and stops the stop-watch.
Display Mode	Momentary	Same effect as MODE button on Telemetry Screen.
Backlight Dim	Toggle	While input is held low, backlight intensity is reduced.
Count Up/Dn	Toggle	While input is held low, both distance counters count down.

Advanced Features

Manual Calibration

The device stores calibration information as the number of pulses produced by the speed sensor for every kilometre (or mile) travelled. If you used the unit's calibration wizard (see B-7) you will not have seen the actual value calculated for your vehicle. In most situations this does not matter, but if you share the device between vehicles, or have different tyre configurations for your vehicle, you may want to record this number for re-use at a later time.

To view the calibration number, navigate to the Calibration menu and select the 'Cal. Distance' item. In the sub-menu that appears, select the 'Value' item. The calibration number will then appear.
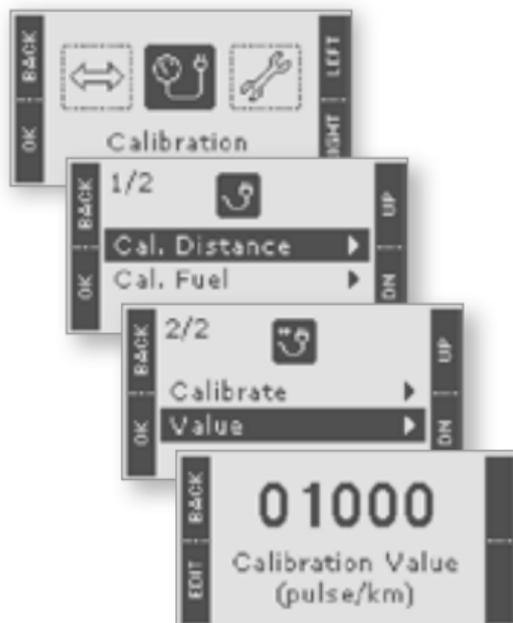
In this same menu you can also manually adjust the displayed value by pressing the EDIT button. This will bring up a data entry screen that will prompt you to enter a new value.

The data entry screen works by allowing you to enter each of the new value's digits individually. The digit that is currently being modified is shown highlighted and can be adjusted using the UP and DN buttons. Once you have set it to the desired value, press the NEXT button to move the highlight to the adjacent digit. When all the digits have been entered, the NEXT button will change to say SET. Press this to complete the process.
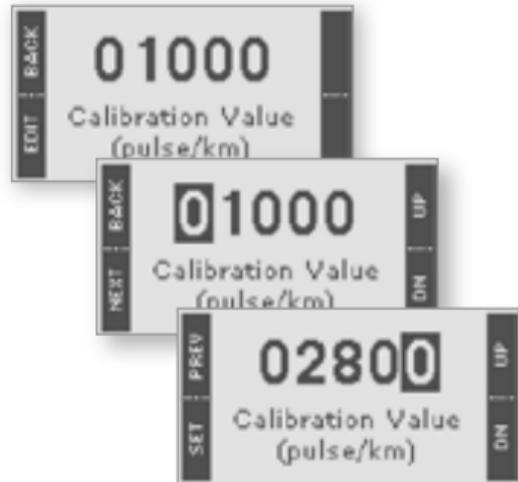
Advanced Features

Fuel Gauge

A full screen fuel gauge can be displayed by navigating to the Fuel Gauge menu. When selected, the current fuel reading is displayed in large digits in the middle of the screen in the current fuel units. On the bottom of the screen a bar graph showing the fuel level as a percentage of a full tank is shown.

Note: Many vehicles will not give a correct fuel reading unless the ignition is turned on.
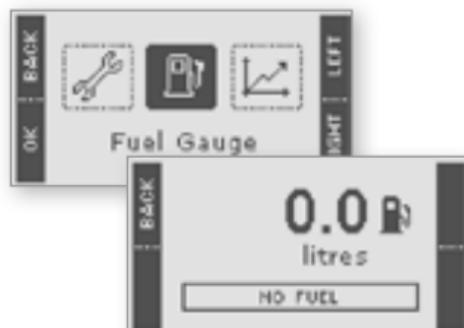
Advanced Probe Setup

The probe input circuit can be configured to operate at two threshold levels and with or without an internal pullup resistor. To adjust these options, navigate to the Settings menu and select the 'Advanced' item. In the sub-menu that appears, select either the 'Probe Pullup' or 'Probe Type' items to toggle the available options. You should only change these settings if instructed to by one of our probe installation guides.

Contrast Adjustment

The display's contrast can be changed to improve viewability under certain conditions. To do this, navigate to the Settings menu and select the 'Contrast' item. This will bring up another menu that will allow you to increase or decrease the contrast level.

Adjusting the Sleep Timer

The unit automatically enters a low power sleep mode after five minutes of inactivity. This feature can be disabled by navigating to the Settings menu and selecting the 'Advanced' item. In the sub-menu that appears, select the 'Sleep' item. This will toggle between the 'on' and 'off' operating states.

Note: if you turn the timer off, take precautions to ensure that your vehicle's battery does not run flat.

Serial Number Location

Every monit rally computer has a unique serial number. To view this number, go to the About menu. The serial number is the nine digit number adjacent to the text 'S/N'.

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