

## Runway Condition Monitor RCM411



Runway Condition Monitor RCM411 has been designed to be a quality control and optimization tool for winter maintenance. RCM411 is also suitable for road condition reporting. The sensor can be installed onto a moving vehicle to follow surface conditions and friction in real time. RCM411 detects all typical contaminant types like:

- Dry (green line color)
- Moist (light blue)
- Wet (dark blue)
- Slushy (violet)
- Snowy (white)
- Icy (red)

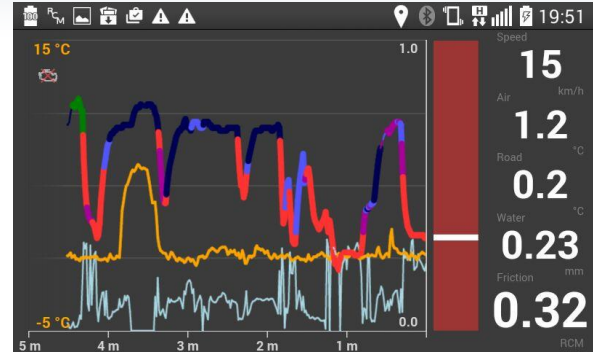
RCM411 also measures water layer thickness in fractions of millimeters up to 3 mm. Measurements of the surface condition and water/ice amount are used to estimate **coefficient of friction**. A braking friction measurement application is integrated into the same user interface on a cell phone to validate the friction model. The results are communicated to selected servers. All the data can be explored with [roadweather.online](http://roadweather.online) on a map interface.

### *Features and benefits:*

- mobile friction measurement with an optical remote sensor
- high accuracy and resolution
- measurements
  - contaminant type
  - water layer thickness
  - friction
  - surface temperature (optional)
- solid state design
  - no moving nor wearing parts
- easy installation
- output
  - serial RS-232 or Bluetooth
- power input 9-30 VDC
- data communication to a cell phone, PC or other systems
- photographs of the surface taken manually, at preselected intervals and at preselected locations



Screen shot of a mobile phone user interface on snowy (white, friction about 0.45), icy (red, friction about 0.35), wet (blue) and dry (green) surface conditions. The yellow dots have been measured by an acceleration based Friction Meter installed in the same cell phone.



Screen shot of the Android user interface on slushy, icy, wet and dry surface conditions (thick violet/blue/red/green line for surface condition). The yellow line shows surface temperature and the blue line water layer. 0.32 is the current friction value measured by the RCM411 sensor. The color bar indicates the status of either surface condition or friction.



Color coded friction values measured by RCM411 on 11.01.2017 at Minneapolis St. Paul International Airport as displayed at [roadweather.online](http://roadweather.online). Hues of red, yellow and green correspond to friction from 0.20 to 0.80. The section below the map shows measured numerical parameters in a graph.

## RCM411 Specifications:

Sensor type:	Runway/Road Condition Monitor RCM411
Measures:	length 100 mm, diameter 75 mm, weight 750 g
Material:	aluminum housing
Cable:	M12 connector
Power supply:	9 ... 30 VDC, power from trailer light connector or cigarette lighter
Power consumption:	about 1 W
Temperature range:	-30 ... 50 °C
Resolution of thickness:	0.01 mm, detection limit 0.03 mm, range 0.03 mm to 5 mm
Accuracy of thickness:	0.1 up to 1.0 mm, 10 % above 1.0 mm
Resolution of friction:	0.01
Accuracy of friction:	0.10 as standard deviation compared to a braking friction reference
Output:	RS-232 serial interface or Bluetooth
Installation:	to a trailer hitch with a ball joint or to another location by bolts
User interface:	Bluetooth connection to a mobile phone. The same phone is used to run a braking friction measurement application to measure absolute friction for reference. The data is communicated to Friction Road Map at <a href="https://roadweather.online">https://roadweather.online</a> and/or to a local server.

## Distributor:

# TECONER

Teconer Oy | Kaupintie 5 | FI-00440 Helsinki | Finland  
Tel. +358 10 583 0020 | [www.teconer.fi](http://www.teconer.fi)