Event Configuration in the Fleet Manager

Introduction

The Fleet Manager 2002 *Professional* SR1 software allows you to define sophisticated events to be monitored by your vehicles. This is one of the most powerful features of the Fleet Manager system.

Definitions

The following section describes the terminology used in the Fleet Manager system.

Devices

A Device is a physical device connected to one of the input lines of the vehicle unit. By definition a device can be either a simple device that is used to monitor one state, i.e. a door switch or a speed sender, or a complex device that can monitor more than one state or accept input, i.e. the FM Terminal or a TCO tachograph.

There are two types of devices, Default devices, which are present in a new database, and User devices that may be added to the system. Only simple devices may be added as User devices.

Each device may only be connected to a certain type of input line on the vehicle unit. The Add Device wizard is used to guide the creation of a new device.

Parameters

A parameter is the calculated value from a Device. All Event definitions are based on a combination of one or more Parameters. There are three types of parameters in the Fleet Manger system.

System Parameters

System parameters are parameters that are standard to the vehicle unit. Examples of these are the Current Date and the Day of Week parameters. These parameters cannot be removed from the system.

Default Parameters

Default parameters are parameters that are automatically created in the Fleet manager system when the Fleet Manager software is installed. These parameters are dependent on a system Device being connected to one of the input lines. Examples of these are the Road Speed and the Engine RPM parameters.

User Parameters

User parameters are parameters that are created by the user and are specific to the user's needs. Examples of these parameters include Fridge Temperature Sender and Door Switch. User parameters are created when a User Device is created.

Operators

Operators are used in the definition of an Event, to relate a Parameter to a Trigger or threshold value. Valid operators are Greater Than (>), Less Than (<), Greater Than Or Equal To (>=), Less Than Or Equal To (<=), and Equal To (=).

Trigger Value

A trigger value is a threshold value, or a Boolean state (true/false) that determines when a condition is true.

Condition

A condition is the combination of a parameter, an operator and a trigger value. A combination of one or more conditions is used to define when an event is recognised by the unit. For example, the default Over Speeding event occurs when the Road Speed parameter is greater than 120 km/h (75 mph).

You could enhance the Over Speeding event to take a Siren On parameter into account. This would be useful in emergency vehicles. In this case, you would define the Over Speeding event to occur when Road Speed is greater than 120 km/h (75 mph) AND Siren On is False. In other words, over speeding would not be recorded in an emergency situation, if the siren were on.

Event Definitions

Events are monitored and recorded by the Fleet Manager on-board computer. An event occurs when the combination of its conditions are true.

All Events can have various attributes assigned to them. This includes a recording delay, the level of detail to be recorded, whether or not to sound the unit's buzzer and whether or not to send an SMS message.

There are three types of events supported by the Fleet Manager system.

System Events

The vehicle unit uses these events internally. These events cannot be configured by the user and are therefore hidden from the event configuration dialogs and reporting functions.

Default Events

These events are automatically created in the Fleet Manager system when the Fleet Manager software is installed. These events cannot be removed from the system, however most can be disabled (not monitored) for a vehicle. Examples of these include the Over Revving and Harsh Braking events.

User Events

The user defines these events, which gather information specific to the organisation's needs. These events normally monitor the user parameters defined for the organisation.

Calibration

Calibration values ensure that the Fleet Manager monitors input lines correctly. The Fleet Manager unit monitors an electrical signal from the sensor or switch in the vehicle. Calibration allows the Fleet Manager system to convert these electrical signals into meaningful values for reporting. Reverse calibration is done when the event configuration is loaded into the unit, i.e. the trigger values entered by the user are converted into the expected electrical values. The Fleet Manager unit can monitor both Frequency signals and Voltage signals.

Structure of Event model

The Event Configuration is structured in three levels, namely the Organisation, Vehicle Configuration Group and Vehicle levels.

Changes made at the Organisation level are automatically cascaded down to the Configuration Group and the Vehicle levels, unless specifically changed at the lower level. The same applies to Configuration Groups; changes at this level are cascaded down to all vehicles belonging to the group, unless specifically changed at the vehicle level.

The Organisation level configuration is available from the Event Definitions menu on the Edit menu on the Main form. The Vehicle Configuration Group and Vehicle level's Event configuration are exposed as part of the Property dialog for the item.

Defining Devices

This section describes the functionality used to create and maintain Devices in the Fleet Manager system.
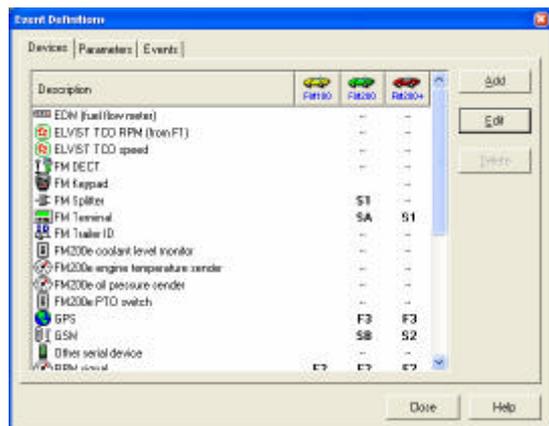
Accessing devices

The Organisation and Configuration Group levels both have a list of devices that may be edited. The Vehicle level shows a list of Input lines and the devices attached to each input. This difference allows defaults to be set for all devices at the Organisation or Configuration Group levels. At the vehicle level only one device can be connected to each input line.

Creation, naming and deletion of devices are only available from the Organisation level.

Creating a new device

To create a new device, click on the **Add** button. The Add Device Wizard is started.

The first step of the wizard allows the ID number and a description to be entered for the new device.

The ID and description must be unique for the database. If the ID number is left at 0, the system will assign the next available device ID.

The second step of the wizard allows the selection between creating a new device and copying the details from an existing device.

If the device is copied, the wizard will display a list of existing devices that may be copied. After selecting the device to copy from, the confirmation step is displayed.
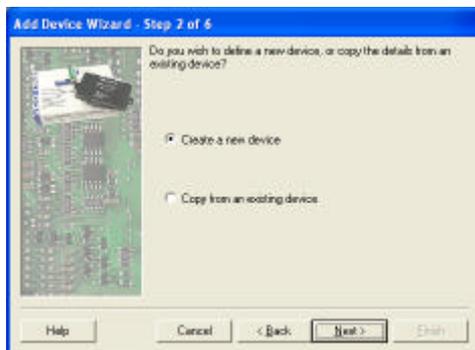
The third step of the wizard specifies the type of device to be attached, from which the system will determine the type of input line the device may be connected to.

There are five types of devices that can be created:

Digital Switch –	These devices are used to monitor the state (on/off, open/closed) of a switch such as a door switch.
Standard Analogue sender –	These devices are used to monitor a range of voltages, between 0 and 38 volts. Example: temperature senders.
High Resolution Analogue sender –	These devices are used to monitor a range of voltages, between 0 and 5 volts. Example: temperature senders.
Pulse Counter –	These devices are used to count the number of pulses generated by a special purpose sender. Example: fuel flow meter.
Frequency sender –	These devices can be used to monitor a range of frequencies. Example: secondary RPM senders.

The fourth step of the wizard offers the option to link the device to an existing parameter, or to create a new one.

If the Existing Parameter is selected, the wizard will display a list of parameters for devices of the same type as the new device. After selecting the parameter, the confirmation step is displayed.

By selecting to use an existing parameter, two or more devices can be used to monitor a single parameter. An example of this is if two types of temperature senders are used in a fleet. A device is created for each type of sender, allowing for separate default calibration settings.

It is important to note that if two devices are linked to the same parameter, only one of the devices may be connected to a vehicle at a time.
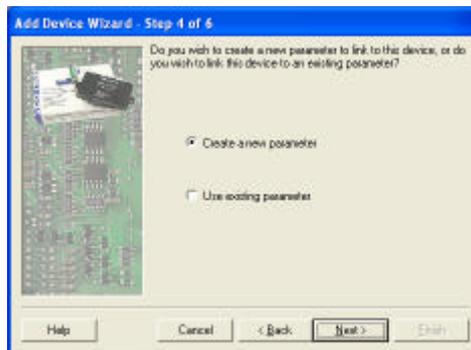

The fifth step of the wizard allows details for a new parameter to be entered.

If a specific ID number is to be assigned, the number should be a negative number, between -9999 and -1. Leaving the ID number at 0 will cause the system to allocate the next available negative ID number. The description of the parameter is required to be entered, and units can be specified if desired. The parameters of a digital switch have no unit.

The final step of the wizard displays the details entered for the device. Please note that the device type and the linked parameter cannot be changed once the wizard is finished.

When the Finish button is clicked, the device and parameter is saved into the Fleet Manager database and is available for use in the system.
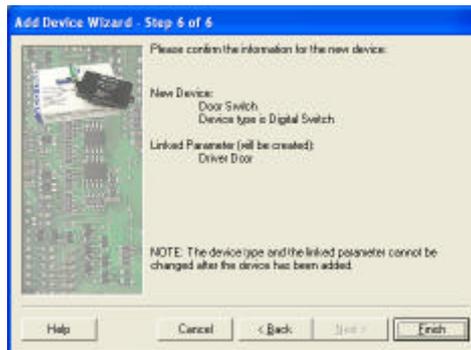
Modifying Devices

Clicking the Edit button will open the properties for a device. At the Organisation and Vehicle Configuration Group levels, the properties will have two tabs, a Device and a Calibration tab. The Device tab shows the device name (which may be changed only at the Organisation level), the input line the device is to be connected to by default, and whether the device should be monitored for interval data.

The Vehicle level displays a list of devices that may be connected to the selected input line. If a Frequency or Analogue device is attached, a Profile tab will be displayed. This is described in the Parameter section below.

The Calibration tab is specific to the type of device, and is described below.

NOTE: It is possible to calibrate a device at the Organisation and Vehicle Configuration Group levels without specifying the device as being connected. This allows a default calibration to be set, and when connected to a vehicle, the device will be calibrated.
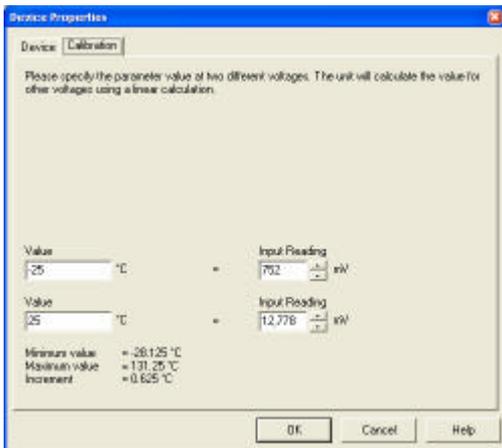
System Devices

The complex System devices each have their own configuration or usage guides. Please refer to these documents for the description of the calibration settings.
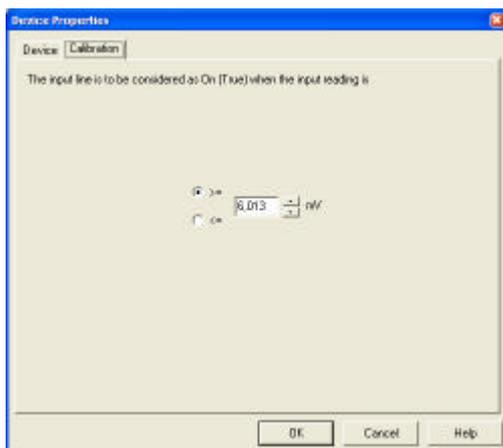
Digital Switches

These devices may only be connected to the analogue input lines. The linked parameter is considered true if the voltage on the line is higher and the Greater than (>=) is used, or if the voltage on the line is lower than the configured value and the Less than (<) used. The Greater than (>=) is used when the parameter is true when there is a higher current (i.e. a light switch), the Less than (<) used when the parameter is true when there is lower current (i.e. a Door switch).

Analogue senders

These devices have a varying voltage that can be calibrated to reflect a value.

The Fleet Manager system assumes that these devices will have a uniform linear set of values. Two values with known voltages have to be entered. Other possible values are calculated by the system from these entries using a linear algorithm. The high resolution analogue send registers an input voltage rang of 0 to 5 volts, and can measure voltages with higher accuracy than that of the standard analogue sender which is able to measure voltages from 0 to 38 volts.
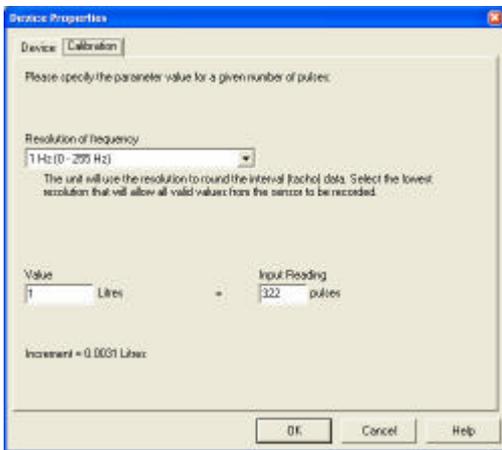

Pulse Counter

Pulse counters calculate a value based on the number of pulses received. As the system assumes 0 pulses to be a 0 value, only one value for a known number of pulses has to be entered. Other values are calculated using a linear algorithm.
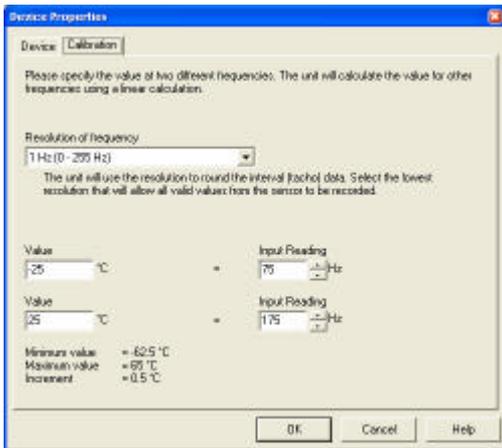
Frequency sender

These devices supply a value based on the frequency received on the input line. The Fleet Manager system requires two values at known frequencies to be entered, and will calculate values for other frequencies using a linear algorithm.
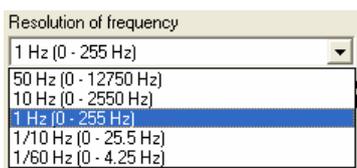
Resolution of Frequency

The frequency and pulse devices also need to specify the resolution of the frequency input. The drop down selection shows the available options and the range of frequencies the device can monitor. This selection affects both the event monitoring and the Tachometer data.

Connecting Devices

Devices may be connected in one of two ways. The first is to create default Input Line connections for the Organisation or Vehicle Configuration by specifying the input line the device is to be connected to. By default the Road Speed parameter is connected to the F1 input line.

The second method of connecting a device is by specifying what device is connected to a specific input line on a vehicle's property page. This will override any configuration specified for the vehicle's Configuration group or the Organisation defaults.

The vehicle will inherit the calibration from the Vehicle Configuration Group. This will be used unless the device's calibration is specifically changed at the vehicle level.

Defining Parameters

This section describes the functionality used to maintain Parameters in the Fleet Manager system.

Accessing parameters
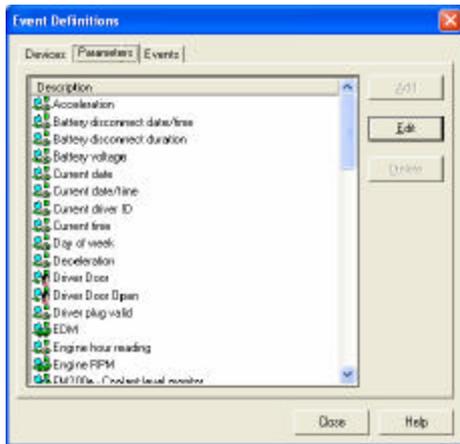
Parameters are defined once for the whole Organisation. The list of parameters is available on the Parameter Configuration tab of the Event Definitions function. This can be accessed from the Event Definitions menu item on the Edit menu, or the Event Definitions button on the Advanced Tab of the Organisation Properties dialog.

Creating a new parameter

See the section in this document to *Create a new device* as parameters can only be created when creating a new device.

Modifying a Parameter

Once a parameter has been created, it can be modified. To do this, select the description in the list and click on the **Edit** button.

The description of the parameter may be changed, but the parameter type may not be changed after the parameter has been created. The Units for the parameter may be changed if the parameter is not a Boolean parameter.
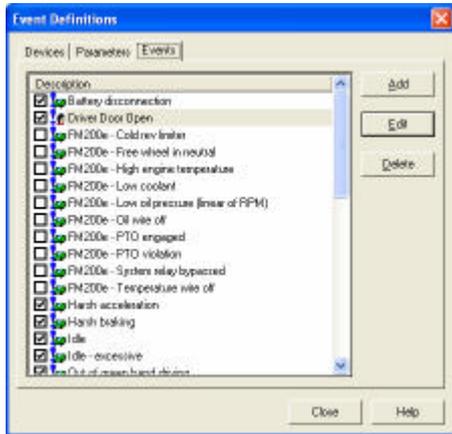
Deleting a Parameter

A parameter cannot be deleted. User parameters are removed from the system when the last device linked to the parameter is deleted.

Defining Events

This section describes the functionality used to create and maintain Event Definitions in the Fleet Manager system.

Accessing Events

The Organisation's list of Event Definitions is available on the Event Configuration tab of the Event Definitions function. This can be accessed from the Event Definitions menu item on the Edit menu, or the Event Definitions button on the Advanced Tab of the Organisation Properties.

At the Organisation level, Events can be created, modified and user events can be deleted.
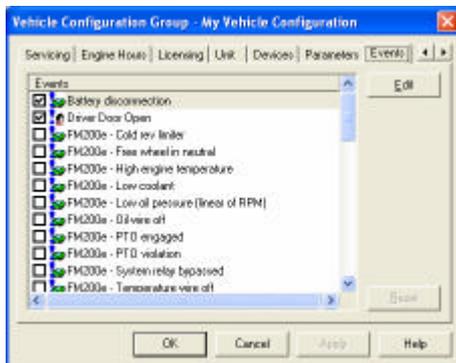
Each Vehicle Configuration Group has an Event Definition tab. This does not allow new events to be created at this level, but only to modify the event definitions for a group of vehicles.

This is a powerful facility and can save time when customising the event definitions of a large group of vehicles that should all have the same event configurations.
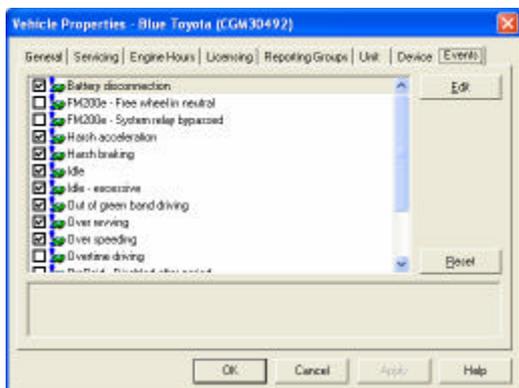
Depending on the unit type, an Event Definition tab may also be available in the Vehicle Properties. Again, event definitions can only be modified at this level.

Only events that can be monitored by a vehicle will be shown in the Vehicle event list. Whether an event can be monitored or not, depends on the Device Configuration settings of the vehicle. For example, a vehicle will not monitor the Over Revving event if the Engine RPM device is not connected.

Creating an Event

To create an event, go to the Event Configuration tab of the Event Definitions. Click on the **Add** button. The Event Definition form will open, starting with the Parameters tab.

First, specify the description for the new event. This description is used to identify the event for reporting purposes. This description must be unique across all events in the Fleet Manager system.

The In Use option specifies whether the event will be loaded to the vehicle unit.

Next specify the conditions under which the event is considered true. Please see the Event Condition Editor section below for more information on how to create conditions. There must be at least one condition defined before the event may be added.

Click on the Record tab. There are a number of settings on this tab. The recording delay is the time that the event must be true before the unit will record the occurrence of the event. If this is disabled then the event will not be recorded by the unit, but can still be used to sound the buzzer or enable the relay.

The Event Type frame allows you to select the required event type to determine the level of detail to be recorded by the unit.

The Recording Options change according to the type of event selected, and allows extra information to be recorded.

The Store Value frame allows you to specify a value to be stored when the event is true. If this option is checked, a drop down list of parameters becomes available from which the required parameter can be selected. The type of value can also be selected. The unit can store the Maximum; Average or Minimum value of the required parameter during the time the event is true. This option may only be specified when adding an event to the system.

The final option allows a message to be entered. This will be displayed after downloading data from the vehicle

There are three event types:

? **Notification** Each start of the Event will be recorded. The end of the event is not recorded; hence the unit will record no duration.
? **Detailed** Each start and end of the Event will be recorded. This means that duration can be shown for each individual occurrence of the event.
? **Summarised** The number of occurrences and the total duration (the total amount of time that the event was true) will be recorded with each sub trip.

Depending on the type of event specified, the Start and End Odometer and the Start and End Position (if a GPS device is attached) can be recorded when the event occurs. Detail Events can also be configured to record the quantity measured by a pulse counter. This is only possible if the vehicle has a Pulse counter device connected.
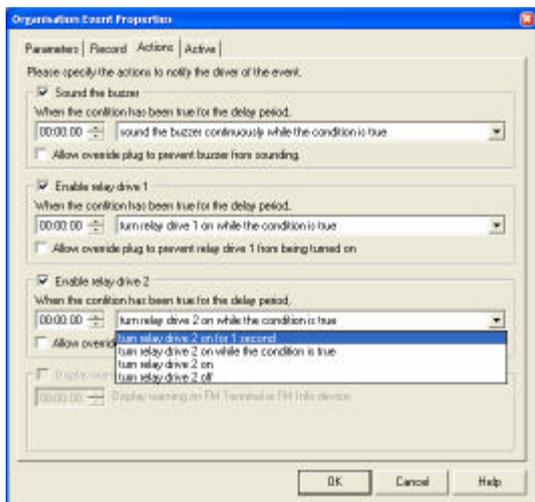
The first option on this tab specifies whether to sound the unit's buzzer. If this is selected, a delay can be specified. Please note that this delay is independent of the Record delay, enabling the unit to sound the buzzer before actually recording the event.

The next two options are used to instruct the unit to enable the external relays when the event occurs.

If either the buzzer or relay is enabled, the System Override may be specified. This will prevent the buzzer from sounding and the relays from being enabled if a System Override plug is inserted before starting a trip. This override only works if a driver was identified, the system disarmed, and the plug inserted before the ignition is turned on. The override is only active until the unit re-arms.

This dialog is always visible at organisation level. It enables the unit to send an SMS message after an event has occurred. There is also the option to send the vehicle coordinates with the event notification. This enables the user to see on a map exactly where the event occurred. The Enable Active Tracking option allows the vehicle to be tracked for a specified amount of time after the event has occurred.
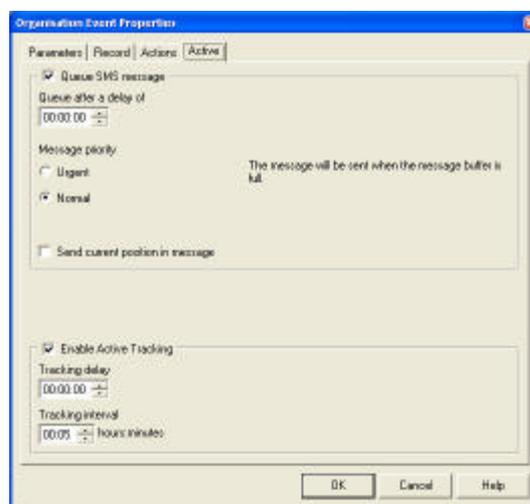
Maintaining an Event

To maintain an event, go to the list of events at Organisation, Vehicle Configuration Group or Vehicle level. Click on the **Edit** button to open the Event Definition dialog. All of the options described under "Creating An Event" can be changed except the option to store a value.

PLEASE NOTE: You must remember to initialise the green code-plug for the vehicle or group of vehicles after adding, editing or deleting events. The Fleet Manager software only reminds you to do this when modifying events at Organisation and Vehicle Configuration Group levels. Changes will only take effect when the new configuration is uploaded into the unit the next time the green plug is inserted into the vehicle's code-plug socket.

Deleting an Event

To delete an event, select the event in the Organisation Event list and click the **Delete** button. Only User Events may be deleted from the system. The system will confirm that the event is to be removed as this action will also remove all information for the event that was recorded by vehicles.

Event Condition Editor

The event condition editor allows the user of the Fleet Manager system to view and modify the conditions that make up an event. Any number of conditions may be entered for an event.

Required and Optional conditions

Default and User parameters can either be required or optional.

If a parameter is required, it must be connected to an input line in the Input Configuration tab of the Vehicle Properties. If it is not connected to an input line, events utilising this parameter in their conditions will not be listed in the Event Definition tab of the Vehicle Properties. Conditions with required parameters are indicated by means of a blue tick icon.

If a parameter is optional, it does not need to be connected to an input line in the Input Configuration tab of the Vehicle Properties. Events utilising these parameters in their conditions will be listed in the event definition of the Vehicle Properties, but the condition containing the optional parameter will not be evaluated by the unit.

An example illustrating this is the Idle event. In the definition of the Idle event, the Road Speed parameter is required and the Engine RPM parameter is optional. For a vehicle that has both parameters connected, both the speed and RPM conditions will be evaluated. For a vehicle that does not have the Engine RPM parameter connected, the event will still be monitored, but only Road Speed condition will be used to determine when the event occurs.

Basic Editing

Each condition is listed on a separate line in the editor. Each line is made up of the parameter's icon (which specifies whether the parameter is required or optional), the description of the parameter, the operator for the condition, the trigger value for the condition, and the units of measure of the trigger value.

The components of the condition that are blue in colour may be edited. In order to change one of these components, move the mouse cursor over the desired component. The mouse cursor will change to an I-bar when it is over an editable entry. Click on the editable entry to begin editing it.

When clicking on an editable entry, a drop down list or an entry field will appear. To change the value, select the desired value, or enter the value in the field.

Editing of a condition is only possible if one condition is selected. It is possible to select more than one condition by holding down the Shift key and clicking on the required conditions. If more than one condition is selected, editing will not be permitted.

Order of evaluation

When evaluating the definition of an event, each condition is treated individually. When there are two or more conditions, each condition is joined to the next using an AND operator or an OR operator. The AND requires that both the conditions be true, the OR only requires one of the conditions to be true.

If the definition contains both AND and OR, the unit will evaluate the conditions joined by AND first, then the conditions joined by OR. This order of evaluation can be changed using brackets (parentheses) to group conditions. Conditions inside brackets are evaluated before other conditions. The event editor will allow brackets to be nested[1] four levels deep.

Inserting a Condition

To insert a condition into the event definition click on the Insert button. A condition will be inserted above the currently selected condition. If this button is disabled, a condition may not be inserted before the

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[1] Nested brackets are when conditions are bracketed within another set of brackets

selected condition. This can occur if more that one condition is selected, or the current condition is part of a default event's definition.

Removing a condition

To remove one or more conditions, select the conditions and click the remove button. Conditions defined as part of a default event cannot be deleted. If more that one condition is selected, and a bracket is part of this selection, the corresponding bracket must also be selected before the remove button will be enabled.

If an opening bracket is the only selected line, removing this will cause the both the opening and closing bracket to be removed. The conditions that were contained within the brackets will be retained.

Moving a condition

It is possible to move one or more conditions relative to the other conditions. When one condition is selected, click on the Move Up button. This will swap the selected condition with the condition above. If more than one condition is selected, the condition above the selection is moved below the selection. The reverse happens if the Move Down button is clicked.

It is possible to move one or more conditions into or out of brackets. If the selection does contain brackets, this will cause the bracket nesting level to be increased or decreased. If the nesting level would exceed four levels, the move would be disallowed i.e. the button would be disabled.

It is not possible to move a single bracket over another bracket. The move button will be disabled to prevent this.

Bracketing conditions

Bracketing conditions changes the order of evaluation of the event's conditions. To bracket conditions, select two or more conditions and click on the Bracket button. The selection conditions will be indented and brackets placed around them.

Configuration Report

The Vehicle Configuration Report, available from the Vehicle Report sub menu allows the configuration for one or more vehicles to be printed. The report shows the devices connected to the vehicle, the calibration as well as the definition for each event that will be monitored by the unit.

Vehicle Configuration Report

Blue Toyota (CGM30492)

Unit Type: FM200	Arming Delay 00:05:00	Standing Delay 00:02:00	Disarm Buzzer Sound for 10 seconds	Configuration transferred

Line	Tacho	Profil	Connected device	Configuration / Settings
F1	☑	☐	Speed sender	Units = Km/h
F2	☑	☐	RPM signal	Units = RPM
F3			* Not Connected *	
I1	☑		Door Switch	On when the input reading is >= 6013.07mV
I2			* Not Connected *	
I3			* Not Connected *	
I4			* Not Connected *	
S1			* Not Connected *	

Event Description	Recording options		Odometer		Position		Record	
	Type	Delay	Start	End	Start	End	pulse	
Battery disconnection Battery disconnect duration > 120 sec	Notify Alarm Relay	00:00:00 00:00:00 --------	☐ One second		☐			Record the latest value of Battery disconnect date/time Battery was disconnected from unit
Harsh acceleration Acceleration > 8 Km/h/s	Summary Alarm Relay Critical	00:00:00 -------- -------- --------						Record the maximum value of Acceleration
Harsh braking Deceleration > 15 Km/h/s	Summary Alarm Relay Critical	00:00:00 -------- -------- --------						Record the maximum value of Deceleration
Idle Ignition on True AND Road speed < 5 Km/h AND Engine RPM > 0 RPM AND Engine RPM < 1500 RPM	Summary Alarm Relay	00:00:00 -------- --------						