CarChip® and CarChip E/X (8211 and 8221) record vehicle trip and performance data to provide a detailed history of driver performance and vehicle operation. Recorded data includes trip start and end times, vehicle speeds, rates of acceleration and braking, and any detected OBDII trouble codes. CarChip E/X also provides additional vehicle monitoring capabilities including the logging of additional engine data parameters and more detailed “accident” data for all sudden stops. The CarChip E/X with Alarm (8225) emits an audible beep whenever a driver exceeds user-determined speed limits. Using the included CarChip software, you can see the logged data in summary, record, plot, or table formats and also export it to other applications.

CarChip and CarChip E/X plug into your car’s OBDII port and are compatible with most passenger cars and light trucks with model years 1996 and later.

**General**

- **Operating Temperature**: -40° to +185°F (-40° to +85°C)
- **Primary Power, Connected to Vehicle**: -9 to 16 VDC, 25 mA
- **Primary Power, Connected to Computer**: USB
- **Backup Power**: Internal battery, 10-15 year life in normal use
- **Memory**: 128KB for CarChip, 512KB for CarChip E/X
- **Data Logging Capacity, CarChip**: 75 hours
- **Data Logging Capacity, CarChip E/X**: 300 hours max., 42 hours min., depending on the number of optional data parameters selected and their logging intervals.
- **Time & Date**: Accurate to +/- 2 seconds per day
- **Mounting**: 16-pin OBDII connector
- **Computer Interface**: USB
- **Computer Cable Length**: 6’ (1.8 m)
- **Alarms (8225 only)**: Audible alarm for exceeding speed, acceleration, and deceleration limits
- **Status LED**: LED, flashes to indicate CarChip status.

**Dimensions**

- For 8211, 8221: 1.875” x 0.982” x 1.334” (48 mm x 25 mm x 35 mm)
- For 8225: 1.875” x 0.982” x 1.429” (48 mm x 25 mm x 36 mm)

**Weight**

- For 8211, 8221: 0.8 oz. (23 g)
- For 8225: 0.9 oz. (25 g)

**Software System Requirements**

- **Operating System**: Windows 98SE, ME, NT4.0, NT2000, XP
- **Disk Space**: 5 MB free disk space
- **Display**: Windows-compatible VGA minimum

**OBDII Compatibility**

- **Supported Protocols**: J1850-41.6, J1850-10.4, ISO9141, KWP2000 (ISO 14230), CAN (Control Area Network ISO 11898)

**CarChip-Compatible Vehicles:**

- **US Market**: Most domestic and import vehicles model years 1996 and later
- **European Market**: Some vehicles model years 1996 - 1999 and most vehicles model year 2000 and later vehicles compliant with the supported protocols listed above.
- **Elsewhere**: Undetermined. 1996 and later vehicles that are compliant with the supported protocols may or may not be CarChip Compatible.
CarChip, CarChip E/X, CarChip E/X with Alarm

Incompatible Vehicles
CarChip meets and complies with most of the supported protocols used with US market vehicles. Despite this, incompatibilities still exist. Review the General CarChip Exclusions List to see the known exceptions, exclusions and anomalies.

Data Display

Trip Log Summary View
Start date and time, duration, distance, max speed, time in top speed band, number of hard braking events, number of extreme braking events, number of hard acceleration events, number of extreme acceleration events, vehicle ID.

Trip Log Report View
Vehicle ID, CarChip data logger ID, start time, end time, duration, time spent at idle, time spent in first speed band, time spent in second speed band, time spent in third speed band, time spent in fourth speed band, distance, average speed, maximum speed, number of hard braking events, number of extreme braking events, number of hard acceleration events, number of extreme acceleration events, list of logged parameters (vehicle speed only for CarChip, vehicle speed plus up to 4 optional data parameters for CarChipE/X), comments.

Trip Log Plot View
Line graph for vehicle speed only for CarChip. Line graph for vehicle speed plus line graphs for up to 4 optional data parameters for CarChipE/X.

Trip Log Table View
Elapsed time for trip and speed every 5 seconds for CarChip. CarChipE/X also logs up to four optional engine data parameters.

Activity Log Summary View
Date and time, CarChip ID, description of event.

Activity Log Event View
Date and time, CarChip ID, description of event, and comments.

Accident Log Summary View (CarChipE/X only)
Date and time, CarChip ID, maximum speed in log.

Accident Log Stop View (CarChipE/X only)
Date and time, CarChip ID, maximum speed in log, comments.

Accident Log Plot View (CarChipE/X only)
Date and time, line graph of vehicle speed for 20 seconds prior to stop.

Accident Log Table View (CarChipE/X only)
Vehicle speed for each of the 20 seconds prior to the stop.

Trouble Log Summary View
Date and time, vehicle ID, trouble code, problem description.

Trouble Log Problem View
Date and time, vehicle ID, CarChip ID, trouble code, problem description, comments, OBDII freeze-frame info (parameters included in freeze-frame vary from vehicle to vehicle).

Data Options

Supported Unit Systems
U.S., Metric, S.I., Custom (mix of U.S., Metric, and S.I.)

Vehicle Speed Logging Interval
5 seconds

Vehicle Speed Bands
4 user-configurable bands identify normal vs. excessive vehicle speeds.

Calculated Data
Hard and extreme braking, hard and extreme acceleration.

Number of Optional Engine Data Parameters
23 total possible as supported by vehicle, up to 4 can be selected at a time.

Optional Parameters Logging Intervals
5, 10, 20, 30, or 60 seconds, user selected.
### Included with CarChip and CarChip E/X

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Range*</th>
<th>Resolution*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vehicle Speed</td>
<td>0 to 158 mph, 0 to 255 km/h, 0 to 70 m/s</td>
<td>0.6 mph, 1 km/h, 0.3 m/s</td>
</tr>
<tr>
<td>Trip Distance Traveled</td>
<td>0 to 10,000 miles, 0 to 16,000 km</td>
<td>0.1 mile, 0.1 km</td>
</tr>
<tr>
<td>Acceleration/Deceleration Threshold</td>
<td>0 to 3 G, 0 to 30 m/sec²</td>
<td>0.03 G, 0.3 m/sec²</td>
</tr>
</tbody>
</table>

### Included with CarChip and CarChip E/X Only

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Range*</th>
<th>Resolution*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engine Speed</td>
<td>0 to 16,384 rpm</td>
<td>1 rpm</td>
</tr>
<tr>
<td>Throttle Position</td>
<td>0 to 100%</td>
<td>0.1%</td>
</tr>
<tr>
<td>Coolant Temperature</td>
<td>-40° to +420°F, -40° to +215°C</td>
<td>2°F, 1°C</td>
</tr>
<tr>
<td>Engine Load</td>
<td>0 to 100%</td>
<td>0.1%</td>
</tr>
<tr>
<td>Air Flow Rate</td>
<td>0 to 8714 lb/min, 0 to 655.35 gm/sec</td>
<td>0.1 lb/min, 0.01 gm/sec</td>
</tr>
<tr>
<td>Intake Air Temperature</td>
<td>-40° to +420°F, -40° to +215°C</td>
<td>2°F, 1°C</td>
</tr>
<tr>
<td>Intake Manifold Pressure</td>
<td>0 to 75 in. hg., 0 to 255 kPaA</td>
<td>0.3 in. hg., 1 kPaA</td>
</tr>
<tr>
<td>Fuel Pressure</td>
<td>0 to 110 psiG, 0 to 765 kPaG</td>
<td>0.5 psiG, 3 kPaG</td>
</tr>
<tr>
<td>O2 Sensor Voltage (up to 8 monitored)</td>
<td>0 to 1.275 V</td>
<td>0.005 V</td>
</tr>
<tr>
<td>Ignition Timing Advance</td>
<td>-64° to 63.5°</td>
<td>0.5°</td>
</tr>
<tr>
<td>Short Term Fuel Trim (up to 2 monitored)</td>
<td>-100% to 99.22%</td>
<td>0.8%</td>
</tr>
<tr>
<td>Long Term Fuel Trim (up to 2 monitored)</td>
<td>-100% to 99.22%</td>
<td>0.8%</td>
</tr>
<tr>
<td>Battery Voltage</td>
<td>6 to 16 VDC</td>
<td>0.01 VDC</td>
</tr>
</tbody>
</table>

* Range and resolution of sensor measurements only. Accuracy is dependent on the accuracy of the vehicle's sensors.

### Package Dimensions

<table>
<thead>
<tr>
<th>Product #</th>
<th>Package Dimensions (Length x Width x Height)</th>
<th>Package Weight</th>
<th>UPC Codes</th>
</tr>
</thead>
<tbody>
<tr>
<td>8211</td>
<td>10.00&quot; x 6.00&quot; x 2.00&quot; (254 mm x 152 mm x 50 mm)</td>
<td>7.0 oz. (.198 kg)</td>
<td>011698 00674 8 011698 00675 5 011698 00676 2</td>
</tr>
<tr>
<td>8221</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8225</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8211</td>
<td>10.00&quot; x 6.00&quot; x 5.00&quot; (254 mm x 152 mm x 127 mm)</td>
<td>2 lb. 1.9 oz. (.962 kg)</td>
<td>3011698 00674 9 30011698 00675 6 3011698 00676 3</td>
</tr>
<tr>
<td>(4-pack)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8221</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(4-pack)</td>
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<td></td>
</tr>
<tr>
<td>8225</td>
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<td>(4-pack)</td>
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</table>