

TORQUE RUSH PERFORMANCE

Mx2 Dual/Single Mass Airflow Sensor Signal Processor

for use with frequency or voltage(V2 only) based sensors

Terms of Use and Sale

Our products are intended for off road use only. Torque Rush Performance Inc. assumes no responsibility for vehicle damage, personal injury, breach of law or any expenses resultant from vehicle modification or use of these products. Any modifications from the original design of a vehicle are done at the user's own risk. Purchase or installation of any of these products constitutes acceptance of these terms by the purchaser or user.

USE

The **Mx2** can be used to combine the outputs of two sensors, or average them, or emulate the output of a different sensor, or re-scale the MAF without tuning software. The **Mx2** uses customizable characterization tables with interpolation.

Installation

The **Mx2** should be mounted away from hot engine parts.

All factory connections to the primary MAF sensor will be maintained, other than the signal out wire which will be cut. The sensor side will now be connected to the **Mx2** Light Green wire and the ECM side will be connected to the **Mx2** Dark Green wire.

The 12V supply and ground circuits of the factory sensor will be shared with the secondary MAF sensor and the **Mx2**.

Only 3 wires are needed for the secondary MAF sensor; 12V, ground and signal out.

Mx2 wiring connections:

Red -- 12V from factory MAF/Combination Sensor wiring

Black – ground from factory sensor wiring

Light Green – signal in from primary MAF sensor

Blue – signal in from secondary MAF sensor

Dark Green – signal out to ECM

Other wires – currently unused, can be configured for use with external switches or 0-5V inputs

Calibration

Device setup and calibration is accomplished using the TRP MAF Magic software application.

Install the MAF Magic software on your PC and connect the **Mx2** via the appropriate USB cable.

You will see a sensor characterization table. You can switch between 3 different tables; Primary MAF sensor, Secondary MAF sensor, and Output. Each is loaded to the device separately.

Modes of Operation:

Ensure that the correct mode is selected when programming the device.

"Dual Add" mode is used where two separate intake ducts feed the engine. All 3 MAF tables will be used. The airflows of both sensors are combined and the frequency output will correspond to the combined airflow per the "Output" table.

"Single" mode allows the device to mimic the output of a sensor different than the actual installed sensor, or to re-scale the output of the sensor. Only the Primary and Output tables will be used, although all 3 tables may be programmed.

"Dual Average" mode will output the average 2 sensors installed in the same duct. All 3 MAF tables are used.

"Dual Subtract" mode subtracts the measured flow of sensor 2 from that of sensor 1. All 3 tables are used.

MAF table programming:

Use the drop down box above the table to select the specific sensor table you wish to program. The software will read from the **Mx2** and display the currently programmed calibration for that table.

Prior to PC app version 7.0: For each table, the step size of the "Frequency" column can be set to either 125 or 150 by selecting either value in the drop down box to the right of the table.

Version 7.0 and up: Any custom values can be entered in the frequency column of each table as some newer MAF sensor characterization tables incorporate variable step sizes. The Mx2 must first have the most recent firmware installed.

Versions 11.0 and up, as long as a V2 Mx2 device is connected, the table type may be toggled between **frequency or voltage based** by clicking on the Frequency/Volts column name.

Table values may be entered either manually or via the copy/paste method. If using copy/paste, ensure that the table is fully populated with rational, ascending values to the end of the column. One column is pasted at a time. Select the correct starting cell prior to clicking "Paste". Some vehicle calibrations use shorter tables. For example, where the MAF sensor is only used by the ECU at lower engine RPM conditions. The app will auto-fill the table to the end if the number of pasted values is less than the number of cells in the column. The remaining cells will be filled with the last pasted value.

The currently viewed table may also be populated by selecting one of the OE tables from the drop down list above the table.

Duct Size:

Primary and Secondary MAF table values may be scaled if the installed intake duct diameter(s) differ from that of the installation from which the pasted tables were obtained. For example, if using an OE table based on a 4 inch duct diameter, and where the new duct sizes are 3 inches, enter 4.0 in the "Original" box below the table and 3.0 in the "New" box. Then click the "Scale to Duct Size" button.

Each table must be programmed to the device individually while it is open in the app, but if applicable, once a single table has been populated, selecting "Copy to All" will program the same values to all three tables in one step when the "Update" button is clicked. Copy to all is not used where flow rates have been scaled for duct size.

Other Settings:

Enter the desired secondary MAF "ignore below" value in the green box. For example, a GM LT1 sensor outputs a frequency of approximately 600 Hz even with no airflow. So anything below 600 Hz from the second MAF can be ignored. For voltage based sensors, the entered value represents millivolts. This value is programmed to the device along with table updates.

The "Write Device" button is used to transfer tables and settings to the device.

The "Send to TRP" button is used when TRP support requests your current device settings. As long as your PC is internet connected, and the Mx2 is connected to your PC, clicking this button will send all device settings to TRP.

LED Status Indicator

When the device is running, the LED will be flashing at a rapid rate. Every flash indicates approximately 2000 output update cycles.

1 double flash- either sensor signal has been lost in "Dual" mode, or the Primary sensor signal has been lost in "Single" mode.

Multiple double flashes indicate a hardware fault

Logging

The MAF signals can be data logged using our MAF Magic software.

Remove the cover from the **Mx2** box and first power it up by switching on the vehicle ignition or starting the engine. Then connect the USB cable between the **Mx2** and your PC and select either "Live Data" or "Record". Selecting record will allow you to save the log file. You can pause playback and use the cursor to view signal values at any point in the chart. If playing a previously recorded file, use the "Stop" button if you wish to end playback before the file finishes playing. The "Playback Speed" slider can be used to adjust the rate at which the chart scrolls through the file.

Firmware Updates

Download and install the current version of the **Mx2** PC app from <http://torquerush.com/downloads.html>

If available, firmware updates may be installed to the **Mx2** by one of the following procedures.

*You must use the current version of the PC app to access all functions of the current firmware.

Method 1 – Auto Update is available in PC app versions 11.0 and higher. Your PC must be connected to the internet.

1. Click the “Firmware Update” tab in the MAF Magic software.
2. Click the “Auto Update” button. If you wish to re-install the current version firmware, first tick the “Allow Same” box.

Method 2 - Manual Update:

1. Download and save the latest firmware file from <http://torquerush.com/downloads.html> TRPMAF_V1.trp for V1 units or TRPMAF_V2.trp for V2 units
2. Click the “Firmware Update” tab in the MAF Magic software.
3. Click the “Manual Update” button.
4. Disconnect the Mx2 from vehicle power. Remove the cover from the **Mx2** enclosure and connect it to your PC using an appropriate USB cable.
5. Browse to and select the the appropriate “.trp” firmware file.
6. Click “Update Module Firmware”.

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