MXL QM/EVO3QM

User Manual









Dear MXL / EVO3 QM Owner

AIM has created technical instruments specifically for the exciting world of jr. dragsters: AIM **MyChron3 660** is considered today the most powerful data logger designed for this kind of vehicles.

Our expertise in the dragster environment now lead to offer a new set of Products designed for drag racing, like the **MXL** QM dash logger and **EVO3 QM** data logger. Professional tools to meet drag heroes needs!



SUMMARY

Chapter 1 – AIM QM World	3
1.1 – QM Products Family	3
1.2 – QMs Kits	5
1.3 – Optional	6
1.4 – EVO3 displays	7
1.5 – AIM Network	8
Chapter 2 – Installation of QM Products	9
2.1 – Gauge-Data logger	9
2.2 – How to connect to your ECU	9
2.3 – How to install and power the acquisition switch	10
2.4 – Sensors	11
Chapter 3 – Configuration of QM Products	12
3.1 – Select configuration	
3.2 – Channels	15
3.3 – System configuration	
3.3.1 – MXL	
3.3.2 – EVO3	17
3.4 – Display	17
3.4.1 - TG dash	
3.4.2 – M3 dash	
3.4.3 – Formula Steering Wheel	
3.5 – CAN Lambda Configurator	20
Chapter 4 – Racel	23
Chapter 5 – Download	24
Chapter 5 – Download 5.1 – QMAn	
Chapter 5 – Download 5.1 – QMAn 5.2 – DragOn	
Chapter 5 – Download 5.1 – QMAn 5.2 – DragOn 5.2.1 – Download window	24 24 25 26
Chapter 5 – Download 5.1 – QMAn 5.2 – DragOn 5.2.1 – Download window Chapter 6 – Analysis	24 24 25 26 28
Chapter 5 – Download 5.1 – QMAn 5.2 – DragOn 5.2.1 – Download window. Chapter 6 – Analysis. 6.1 – Test/Run manager.	24 24 25 26 28 28 28
Chapter 5 – Download 5.1 – QMAn 5.2 – DragOn 5.2.1 – Download window. Chapter 6 – Analysis. 6.1 – Test/Run manager. 6.2 - Analysis View	
Chapter 5 – Download 5.1 – QMAn 5.2 – DragOn 5.2.1 – Download window. Chapter 6 – Analysis 6.1 – Test/Run manager 6.2 - Analysis View 6.2.1 – Time Plot	24 24 25 26 28 28 31 32
Chapter 5 – Download 5.1 – QMAn 5.2 – DragOn 5.2.1 – Download window. Chapter 6 – Analysis. 6.1 – Test/Run manager. 6.2 - Analysis View 6.2.1 – Time Plot. 6.2.2 – Histogram.	24 24 25 26 28 28 31 32 37
Chapter 5 – Download 5.1 – QMAn 5.2 – DragOn 5.2.1 – Download window. Chapter 6 – Analysis 6.1 – Test/Run manager 6.2 - Analysis View 6.2.1 – Time Plot 6.2.2 – Histogram 6.2.3 – XY Plot	24 24 25 26 28 28 31 32 37 39
Chapter 5 – Download 5.1 – QMAn 5.2 – DragOn 5.2.1 – Download window. Chapter 6 – Analysis. 6.1 – Test/Run manager 6.2 - Analysis View 6.2.1 – Time Plot. 6.2.2 – Histogram. 6.2.3 – XY Plot. 6.2.4 – C hannel info.	24 24 25 26 28 28 28 31 32 37 39 41
Chapter 5 – Download 5.1 – QMAn 5.2 – DragOn 5.2.1 – Download window. Chapter 6 – Analysis 6.1 – Test/Run manager 6.2 - Analysis View 6.2.1 – Time Plot 6.2.2 – Histogram. 6.2.3 – XY Plot. 6.2.4 – C hannel info. 6.2.5 – How to set the time slip info.	24 24 25 26 28 28 28 31 32 37 39 41 42
Chapter 5 – Download 5.1 – QMAn 5.2 – DragOn 5.2.1 – Download window. Chapter 6 – Analysis. 6.1 – Test/Run manager 6.2 - Analysis View 6.2.1 – Time Plot. 6.2.2 – Histogram. 6.2.3 – XY Plot. 6.2.4 – C hannel info. 6.2.5 – How to set the time slip info. 6.2.6 – How to set weather station data	24 24 25 26 28 28 28 31 32 37 39 41 41 42 43
Chapter 5 – Download 5.1 – QMAn 5.2 – DragOn 5.2.1 – Download window. Chapter 6 – Analysis. 6.1 – Test/Run manager. 6.2 - Analysis View 6.2.1 – Time Plot. 6.2.2 – Histogram. 6.2.3 – XY Plot. 6.2.4 – C hannel info. 6.2.5 – How to set the time slip info. 6.2.6 – How to set weather station data 6.3 – Test Loaded View.	24 24 25 26 28 28 31 31 32 37 39 41 41 42 43 44
Chapter 5 – Download 5.1 – QMAn 5.2 – DragOn 5.2.1 – Download window. Chapter 6 – Analysis. 6.1 – Test/Run manager 6.2 - Analysis View 6.2.1 – Time Plot. 6.2.2 – Histogram. 6.2.3 – XY Plot. 6.2.4 – C hannel info. 6.2.5 – How to set the time slip info. 6.2.6 – How to set weather station data 6.3 – Test Loaded View. 6.3.1 – Run Info	24 24 25 26 28 28 31 31 32 37 39 41 41 42 43 44
Chapter 5 – Download 5.1 – QMAn 5.2 – DragOn 5.2.1 – Download window. Chapter 6 – Analysis 6.1 – Test/Run manager 6.2 - Analysis View 6.2.1 – Time Plot. 6.2.2 – Histogram. 6.2.3 – XY Plot. 6.2.3 – XY Plot. 6.2.4 – C hannel info. 6.2.5 – How to set the time slip info. 6.2.6 – How to set weather station data 6.3 – Test Loaded View 6.3.1 – Run Info. 6.3.2 – Time Slip.	24 25 26 28 28 31 32 37 39 41 42 43 44 45 46
Chapter 5 – Download 5.1 – QMAn 5.2 – DragOn 5.2.1 – Download window. Chapter 6 – Analysis. 6.1 – Test/Run manager 6.2 - Analysis View 6.2.1 – Time Plot. 6.2.2 – Histogram 6.2.3 – XY Plot. 6.2.4 – C hannel info. 6.2.5 – How to set the time slip info. 6.2.6 – How to set weather station data 6.3 – Test Loaded View 6.3.1 – Run Info 6.3.2 – Time Slip. 6.3.3 – Tachometer.	24 25 26 28 28 31 32 37 39 41 42 43 44 45 46 46
Chapter 5 – Download 5.1 – QMAn 5.2 – DragOn 5.2.1 – Download window. Chapter 6 – Analysis 6.1 – Test/Run manager 6.2 - Analysis View 6.2.1 – Time Plot. 6.2.2 – Histogram. 6.2.3 – XY Plot. 6.2.4 – C hannel info. 6.2.5 – How to set the time slip info. 6.2.6 – How to set weather station data 6.3 – Test Loaded View 6.3.1 – Run Info 6.3.2 – Time Slip 6.3.3 – Tachometer. 6.3.4 – Weather	24 24 25 26 28 28 31 31 32 37 39 41 42 43 44 45 46 46 46 47
Chapter 5 – Download 5.1 – QMAn 5.2 – DragOn 5.2.1 – Download window. Chapter 6 – Analysis. 6.1 – Test/Run manager 6.2 - Analysis View 6.2.1 – Time Plot. 6.2.2 – Histogram. 6.2.3 – XY Plot. 6.2.4 – C hannel info. 6.2.5 – How to set the time slip info. 6.2.6 – How to set weather station data 6.3 – Test Loaded View 6.3.1 – Run Info. 6.3.2 – Time Slip. 6.3.3 – Tachometer. 6.3.4 – Weather Appendix "A" – Technical draws	24 24 25 26 28 28 28 31 32 37 39 41 42 43 44 45 46 46 46 47 48
Chapter 5 – Download 5.1 – QMAn 5.2 – DragOn 5.2.1 – Download window. Chapter 6 – Analysis. 6.1 – Test/Run manager 6.2 - Analysis View 6.2.1 – Time Plot. 6.2.2 – Histogram. 6.2.3 – XY Plot. 6.2.4 – C hannel info. 6.2.5 – How to set the time slip info. 6.2.6 – How to set weather station data 6.3.1 – Run Info. 6.3.2 – Time Slip. 6.3.3 – Tachometer. 6.3.4 – Weather Appendix "A" – Technical draws A.1 – MXL/EVO3 QM Pista: AMP female connector.	24 24 25 26 28 28 28 31 32 37 39 41 42 43 44 45 46 46 46 46 47 48
Chapter 5 – Download 5.1 – QMAn	24 24 25 26 28 31 31 32 37 39 41 42 43 44 45 46 46 46 47 48 48 49
Chapter 5 – Download 5.1 – QMAn 5.2 – DragOn 5.2.1 – Download window. Chapter 6 – Analysis. 6.1 – Test/Run manager 6.2 - Analysis View 6.2.1 – Time Plot. 6.2.2 – Histogram 6.2.3 – XY Plot 6.2.4 – C hannel info. 6.2.5 – How to set the time slip info. 6.2.6 – How to set weather station data 6.3 – Test Loaded View 6.3.1 – Run Info. 6.3.2 – Time Slip 6.3.3 – Tachometer. 6.3.4 – Weather Appendix "A" – Technical draws A.1 – MXL/EVO3 QM Pista: AMP female connector A.2 – MXL QM Pro: 22 Pins Deutsch connector. A.3 – EVO3 QM Pro: 22 Pins Deutsch connector.	24 24 25 26 28 31 31 32 37 39 41 42 43 44 45 46 46 46 47 48 48 49 49



Chapter 1 – AIM QM World

1.1 – QM Products Family

MXL QM has been engineered to help you increase your dragster consistency and overall performance. **MXL QM** is a high tech digital dash for your vehicle with plenty of channels and capable of the easiest connection to the most important ECUs on the marketplace.

QMs are specifically designed for Full Scale Dragsters, basing on eighth mile and quarter mile.

QMs store runs starting with a manual switch - following NHRA rules - and can log RPM, up to 4 speed inputs, up to 12 analog channels and extended channels from an ECU interface (via CAN bus or RS232). All the setup is easily performed through the AIM **DragOn** software.

A whole racing week-end data can also be reviewed directly on the wide backlighted display, for immediate evaluation of the most important measures at the time slip times.

QMs can be interfaced (via Proprietary CAN bus) with virtually infinite AIM **LCU-One** lambda controllers.

There is virtually no limit to the sensors that can be connected to QMs: engine rpm sensors, clutch rpm sensors, driveshaft rpm sensors, speed sensors, EGT (k-thermocouples), thermo resistors, pressure transducers for oil, water and brake, potentiometers, accelerometers, gyrometers.

All data are logged into the internal 8-16 MB flash memory (depending on QM version) and can be downloaded to the PC through USB connection or a powerful **DataKey**, both via the **QMConnect** software. AIM **QMAn** powerful software lets you create your personal Elapsed Time database and analize performance data.

Both **DragOn** and **QMAn** software are available also on website <u>www.aim-sportline.com</u> website.

If you want to stay up to date with latest releases, please refer to our download section. After downloading, double click the file and follow Prompted instructions.

Your QM **Pista**/Pro records both your and your vehicle's performances in detail. We present the QM in two versions:



QM Pista

- 8MB Memory
- 8 Analog channels
- 1 Digital speed input
- 2 AMP Connectors (12pins 16pins)





A – B: 12+16 AMP connectors

These connectors Provide:

- Power supply
- ECU connection (via CAN and RS232 Protocol)
- Analog inputs
- USB communication

C: 4 pins binder connection

This connector Provides "Data Acquisition Switch" connection

D: 5 pins binder connector

This connector Provides "CAN for Exp. Modules" channel connection

QM Pro **05**

- 16MB Memory
- 12 Analog channels
- 4 Digital speed inputs
- 2 Professional Autosport Connectors (22pins – 37pins)





A: 22 pins DEUTSCH connector

This connector Provides:

- Power supply
- ECU connection (via CAN and RS232 Protocol)
- USB communication
- "External shift light" connection
- "CAN for Exp. Modules" connection
- Speed Channel #3 #4

B: 37 pins DEUTSCH connector

This connector Provides:

- Power supply
- "Data Acquisition Switch" connection
- RPM signal
- Speed Channel #1 #2
- Analog inputs

Both of them have non-volatile Flash internal memory that keeps stored data even when power is off.



1.2 – QMs Kits

AIM has developed two QM kits to fit various situations; the table below shows the standard equipment in each kit as well as optional equipment.

MXL/EVO3 QM Pista

- MXL/EVO3 QM Pista
- Start acquisition switch
- AMP harness with
- 4 Thermocouple inputs
- 4 analog channel inputs
- 1 speed channel input
- 1 Speed sensor
- USB Cable + QM Softwares
- This manual

MXL/EVO3 QM Pro 05

- MXL/EVO3 QM Pro 05
- Start acquisition switch
- 37 pins harness with
- 8 Thermocouple inputs
- 2 speed channel inputs
- 22 pins harness with
- 2 speed channel inputs
- 2 Speed sensors
- USB Cable + QM Softwares
- This manual

Part Numbers

MXL QM Pista: X16MXLCQM EVO 3 QM Pista: X20EVO3CQMO MXL QM Pro 05: X16MXLPQM

EVO 3 QM Pro 05: X20EVO3PQMO



MXL QM & EVO3 QM User Manual Release 1.02

1.3 – Optional

LCU One



Data Hub



TC Hub



LCU-One uses a wide band Bosch LSU 4.9 sensor and measures Lambda values from 0.65 to 1.6. This allows a much more accurate monitoring, which leads to a better setup of your engine and, in particular, of your injection.

AIM developed **Data Hub**, the new CAN connection multiplier that works as an interface between AIM Logger (**MXL QM/EVO3 QM**) and its peripheral equipments.

Each Hub connects the logger with four peripherals: i.e. **LCU lambda controller**, and one or more **TC Hub** (thermocouples multiplier).

You can of course use more Data Hub in series to have all connections you want. Data Hub takes all the information you need to your logger with only one cable, minimizing wires overall.

TC Hub is the new thermocouples multiplier.

Each **TC Hub** allows you to connect via CAN bus four additional thermocouples to your QM logger: you can of course use more **TC Hub** to have all desired temperature sensors at your disposal.

With **TC Hub** you can keep regularly under control exhaust gas temperature (EGT) of each cylinder in addition to water, oil and cylinder head temperature (CHT).

Moreover, thanks to **TC Hub**, wires overall is reduced to the minimum.

External shift light



Used to worn the racer on the upshift needs.



MXL QM & EVO3 QM User Manual Release 1.02

1.4 – EVO3 displays

These are the available displays for the EVO3 units.

TG dash



M3 dash



Formula Steering Wheel





1.5 – AIM Network



AIM Products can communicate each other using CAN technology. This is an example of **MXL** supporting 8 **LCU One** Lambda controllers through 3 Data Hubs but it is possible to have as many solutions as needed.

This guide is divided into five main sections, facing the main issues commonly found in the Product use. These issues are exposed using the natural order of the Product use.

- 1. Installation of QM Products
- 2. Configuration
- 3. Race!
- 4. Download
- 5. Analysis



Chapter 2 – Installation of QM Products

We're going to guide you into the installation of our Products. Please mind that a complete installation of a QM Products requires specific knowledge of vehicle electronics.

2.1 – Gauge-Data logger

This section guides you into the major issues that you'll be facing while installing the gauge or the data logger.

Before installing, please define your installation final user between Mechanic or Driver. Nothing will change except your **MXL** and acquisition switch onboard location. Drivers typically use **MXL** as a replacement of stock dash while Mechanics place **MXL** in an easily viewable and reachable point. This info does not apply to **EVO3** because there's no display.

Either **MXL** or **EVO3** must be kept away from heat sources and vehicle's fluids, like any other race electronics instrumentation.

As told before, **MXL** and **EVO3** can be installed almost everywhere on the vehicle but, in order to avoid electromagnetic noise, keep it away from coil and all ignition system components working in high voltage mode. High voltage noise is a common Problem of all electronic instrumentations.

2.2 – How to connect to your ECU

AIM Products like your QM **Pista/Pro** can be interfaced to most racing Engine Control Unit (ECU) using a RS232 serial cable or a CAN cable in order to collect data out coming from the ECU itself. To know if your ECU is supported by QM **Pista/Pro** and for further information about QM – ECU connection, please refer to our website.

As long as ECU manufacturers update their Products constantly, refer to our website for latest information and refer to your ECU's manual to ensure that pin connection is correctly set.

ECU communication is made of few wires (two/three) to be connected, follow specific ECU documentation that can be found on our website.

Using ECU communication you will be able to acquire a wide range of data without installing any additional sensors.



2.3 – How to install and power the acquisition switch

The manual acquisition switch (shown on the right) has ON / OFF positions. When both engine and MXL are turned on, with the acquisition switch in "OFF" position, the **MXL** shift light led blink sequentially, warning that **MXL QM** is in idle condition but is not acquiring data. Turning the acquisition switch ON will turn shift light led off and start data acquisition. Turning the switch OFF will stop data acquisition and push the system back to idle condition.



This is an example of acquisition switch installation.

In this case, the crew chief will turn the acquisition switch on just before the car starts for the run.

Part Number: X05DCHGF0





2.4 – Sensors

This section gives you info about of all the sensors that can be connected to our data loggers.

- engine rpm sensors
- clutch rpm sensors
- driveshaft rpm sensors
- speed sensors
- EGT (k-thermocouples)
- Thermo resistors
- pressure transducers for oil, water, fuel and brake
- potentiometers
- accelerometers

Warning: please remember to ground system/sensors with the battery in order to avoid system/sensors failures



Chapter 3 – Configuration of QM Products

The configuration is done through our DragOn software. The configuration software is rich of features as our Products are among the most powerful loggers in the world, plenty of different possibilities.

Our advise is to practice our software before starting using its advanced configuration possibilities.

To run DragOn or QMAn software you may either:

• Double click the aside desktop icons



 Click one of the shortcuts: Start \ Program \ AIM Racing Data Power \ Dragster \ DragOn or Start \ Program \ AIM Racing Data Power \ Dragster \ QMAn

The following screenshot shows you **DragOn** software layout.

File ?												_ 0
•	Mxl QM Mxl QM Pro Evo3 QM Evo3 0	QM Pro										
Go to QMAn		Tran Current configura	ismit ation	R	eceive							
	845 32 235 6H_3 326 CH_4 678	Installation DEFAULT	Data logge MXL QM	Ecu None - None	Vehicle name DEFAULT	Available time 8.48.56 (h	Time with GPS 3.58.06 (h	Total frequ 131 (Hz)	Master fre 131 (Hz)	Expansions 0 (Hz)	Video system No	Tot. Lambda O
Download	Select configuration Channels System	n configuration C	AN-Lambda co	onfigurator								
	New Di	elete		lone	Imp	ort	Export	_				
CAN-net info	N Installation name	ECU Ma	anufacturer		ECU Model			Vehicle name	•	Created		Tot. Lambda
	1 DEFAULT	T None		<u>-</u>	None None			DEFAULT	<u>1</u>	January 03, 3	2008	<mark>0 .</mark> .
Conline												
Calibration												
Set acquisition system time												
Custom sensor manager												

The left software toolbar includes several command buttons that will be explained in the following pages.

The center-right part of the window features a tab with an item for every QM Product: **MXL QM**, **MXL QM Pro**, **EVO3 QM**, **EVO3 QM Pro**. All the tabs will feature mostly the same possibilities for all QM Products. The correct picture of every gauge will be displayed as soon as you select the tab.

DragOn software features a configuration database, particularly useful to drivers and Proinstallers: as a driver, you will be able to keep 2 (or more) configurations for every kind of race (qualify, shoot-outs, eliminations). On the other side, Pro-installers may find it useful to trace customer's configurations for troubleshooting purposes.



Every configuration in the PC database can be sent to the data logger to Program its use (transmit), and it is possible to check the configuration of a data logger copying it from the data logger to the database on your PC (receive).

To transmit configurations:

Connect your instrument to the USB port of your PC using the included USB cable and turn your logger on.

Click the "Transmit" button. This operation will DELETE all your stored runs on logger's memory, so please ensure to download your data before transmitting configurations.

To receive configurations:

Connect your instrument to the USB port of your PC by using the included USB cable and turn your logger on.

Click "Receive". Your configuration database will be incremented by one. The last configuration (at the bottom) is the one you just received.

The lower part of the software features another tab control, each items of which will be explained now. The differences within these items among the QM Products will be evidenced.

3.1 – Select configuration

As already explained our software features a configuration database to trace all your possible data acquisition layouts. In the "Select configuration" tab you can create, delete or modify configurations' basic settings.

The commands available for configuration management are:

- **New** Create a new configuration layout
- **Delete** Delete an existing configuration
- **Clone** Copy an existing configuration
- **Import** Import a configuration from File to Database (e. with the aim of moving it from another PC to your Database)
- **Export** Export a configuration from Database to File (e. with the aim of moving it from your Database to another PC)

The columns in the configuration grid are:

- **N** the creation number of the configuration
- **Installation Name** a name that keeps the configuration easily identifyable
- ECU Manufacturer if you connect our Product to an ECU, choose the ECU manufacturer name, otherwise select None
- **ECU Model** the model of the ECU
- Vehicle Name useful for installers who want to track where a configuration is used
- **Created** creation date of the configuration
- Tot. Lambda how many LCU-One the system is connected to



Some fields implement an "in place edit", some other open some combo boxes, as shown in the following screenshot.

No CM Md CM Md CM / Too Co CM / Excl CM / Ford Image: Contract of C	
Teamin Receive Carter Configuration Developing Teamin Receive Developing Control Configuration Developing Teamin Receive Developing Developing Control Configuration Developing <	
Image: Control Contro Control Control Control Control Control Control Control	
Contraction Contracti	
Download Installation Detection Detection Status type: Example and type: Matchine And data type: And data type: Matchine And data type: And type:	
Durnhold Stock or figure for the office result Durnhold Stock or figure for the office result Durnhold None Durnhold CAM rest info Durnhold Durnhold Durnhold Durnhold None Debte Clone Inspect Enpect CAM rest info Distributer Clone Durnhold Velocity and the office result CAM rest info Distributer Clone Dispect Conder 24, Clone CAM rest info T stock T proc Most Nets, 2006/07 Clone Conder 24, Clone Catabaction Catabaction Clone Processing Clone Clone Set acquisition Set acquisition Most Nets, 2006/07 Clone Clone Set acquisition Most Nets, Clone Most Nets, 2006/07 Clone Clone Set acquisition Most Nets, Clone Most Nets, 2006/07 Clone Clone Set acquisition Most Nets, Clone Most Nets, 2006/07 Clone Clone Set acquisition Most Nets, Clone Most Nets, 2006/07 Clone Clone Material Most Nets, Clone Most Nets, 2006/07	Video notem Tot Lan
Durmiced Select configuration CAM web do configuration CAM web do configuration CAM web do configuration CAM web and M Induition norm CCUMMandataterr CCUMMandataterr CCUMMandataterr CAM web and M Induition norm CCUMMandataterr CCUMMandataterr CCUMMandataterr CAM web and M Induition norm CCUMMandataterr CCUMMandataterr CCUMMandataterr CAM web and M Induition norm CCUMMandataterr CCUMMandataterr CCUMMandataterr CAM web and M Induition norm CCUMMandataterr CCUMMandataterr CCUMMandataterr CAM web and M Induition M Induition Counter and Induition Calibration M Induition M Induition Soft aceptaintion M M M Modelial M M M <	No 0
Dumited Sector configuration Distance Expert Expert CAN not info N Installation name ECU Manufacturer ECU Manufacture	
Select configuration [CML-select configuration] CAM not info CAM not	
New Defete Lose Inpart Export CAN red info N Profabilition name ECU Monfacturer ECU Monfacturer ECU Monfacturer Context Conte	
CAN not info N Installifor name COUNtruitaturer ECUModil Veloci name Coulder 24 0 Online 1 STOCI 1 Online N Installifor name Coulder 24 0 Online 0 Veloci name 0 N Installifor name Coulder 24 0 Online 0 0 N Installifor name Coulder 24 0 Online 0 0 N Installifor name Coulder 24 0 Online 0 0 N Installifor name Coulder 24 0 Online 0 0 N Installifor name Coulder 24 0 Online 0 0 N Installifor name Coulder 24 0 Online 0 0 N Installifor name Coulder 24 0 Online 0 0 0 N Installifor name 0 Online 0 0 0 0 N 0 Online 0 0 0 N N 0 On	
CAN net into N Installation name COUNTRALIST COUNTRALI	
CAN net info N Installation name ECU Manufacturer ECU Model Veteor name Control 1 STOCK T (nos) Installation Installation Control Contro Control Contro Con	
CAM net info 1 CTOCK I Code NUSTRIE_2008(07) ±1 DEFRECT I Codecr24 3 Oraline CALLAR ■ CALLAR ■ CALLAR ■ 2 Calibration CALLAR ■ ■ CALLAR ■ 3 Calibration Calibration ■ CALLAR ■ 3 Calibration Calibration ■ Calibration Set acquisition MOLENA MOLENA ■ Vertice Calibration MOLENA MOLENA ■ Set acquisition MOLENA MOLENA MOLENA Molena MOLENA MOLENA MOLENA	Tot. Land
Calibration Gen	2007 0
Carles Ca	
Orano Oranoo O	
Cabbration Cabbration Cabbration Set acquisition Set acquisit	
Calibration Calibrati	
Calibration Calibr	
Calibration Calibration Calibration Calibration Color	
G G G G G G G G G G G G G G G G G G G	
Operation Operation Set acceptation system time system time Proceeding Concerned Note:::: Concerned Note:::: Proceeding	
Set acquinition COLOR system time PACIA eggina t	
Set acquisition system time	
PACTAR PACTORIC MOTEC NUTRA NUTSA NUTSA	
MCCROAC MORE WILSON MCCRA	
NUCC. NICON NICON ACCEL	
NDSAN PECTEL	
Porter Porter	
Custon sensor	
Banager PACTION STAT	
SCOEMO	
9/20/G	
SVELE	
WALRO	
WOUP V	



3.2 – Channels

You have to instruct the data logger in order for it to know what are the sensors it's getting information from, channel by channel.

As shown in the screenshot, for every channel the following fields are shown:

- **Channel identifier** this identifier cannot be changed as it is meant to match the channels' names on logger's hardware.
- Enabled\Disable to satisfy every driver's needs, you can select the channels you're interested to acquire data from. Enabled means it will be sampled, disabled will not be logged.
- **Channel name** every channel has a pre-defined name that can be customized (e. Water T for water temperature).
- **Sampling frequency** how many samples per second the logger will do for the channel.
- Sensor type the sensor installed (or that you are going to install) on the related channel, every sensor has its own features, so the logger must be Programmed to know what is connected in order to sample the correct information
- **Measure unit** The measure unit of the installed sensor
- Low Scale / High Scale The minimum and maximum value that will be viewed in graphical form during Analysis Process.

				1211111								_			
		NH CH MHCH	Pro Evel GM Evel	IGM Pre											
				10 1											
	Ge to GMAn		and the second se		ALLER .										
	_	100	- 16	Current control	uration		10-10 V								
		Parts -	13 295	Instalation.	. Dutis logge	. Ene	Vehicle name	Available time	Time with GPS	Total freques	Marker fre	E-pansons	Video	rystem Tot.	Lant
		Contraction of the local distribution of the	CH. 1 810	\$10CK	MDE OM	FORD - MU	DEFAULT	3.32.32.01	2.22.94 (%).	326-(Hz)	326 (Hz)	0 (Hz)	No.	0	
		1000													
2	Download	I and the second second	and the second data												
-	Second 1	Select configu	non Channels Syst	en contiguation	CAVI Cambda (ordgadus									
-		Speed													
		Inde													
			_												
100		Wheel crounts	mence (inch) 65.52												
4	CAN-net inlo		And And And And	-											
	122400000000000000000000000000000000000	Public per who	el revolution [1												
		1		1.01				<u>.</u>			0				
		Channel iden	Enablediduabled	Channel name		Sa	npleg fings	Sensir type .		1	Note that	Low scale	_	High scale	
4	Godene	2211	T [*] Dicabled	Engine		T 10	H <u>+</u>	Engine revolution	speed		pre .	0	T	100001	
16	_	590_1	IT Enabled	Speed		T 10	Hz <u>x</u>	J Speed		1	uh:-2	0	1	150	
		OUL	P Enabled	Channel_1		1 10	HQ 2	Generic linear 0-1	54	-	1.1	± 0	1	5	
100		01,2	P Enabled	Channel,2		1 10	iq 🗶	Generic linear 0-1	5¥.	20	14	= 0	1	5	
5	Calibration	00	P. Enabled	Channel_3		1 10	19 <u>*</u>	Generic linear 0-1	54	-	1.1	1 0		5	
-		06.4	P Enabled	Channel_4		1 10	10 A	Generic linear 0-1	5 W		1.1	10	1	5	
		005	P Enabled	channel_5		1 10	HC	Generic linear 0-1	54		1.1	±10	-	5	
100	Cat accessible	01.6	F? Enabled	Channel_6		1 10	H2 _	Generic Inear 04	5¥	1	1.	1 0		5	
2	system time	01_7	F7 Enabled	Charnel 7		1 10	H2	Generic linear 0-1	5.4	21	1.	20		5	
	CONTRACTOR OF	01.0	IP. Enabled	Channel_8		1 10	12 2	Generic linear 0-5	5 V	21	a .	-0		5	
		CALCLODAR	E Doabled	Calcear		1 10		Calculated Gear				0			
		ACC_1	17 Enviced	LMACE		1 10	10 21	Lateral accelerum	ueter		1.01	-4			
		100,199	Er Erstend	LoggerTrep		1 10	19 <u>A</u>	1 Cost jone				<u>n</u> 20	- 븻	120	
-	Custom service	DATI DOLLA	St. Erstord	Succery .				1 Dattery						19	
22	manaper	100,1	FT Enabled	H CONTRACT		Tin		Country agent on				100		10000	
-		FOX 3	C Enabled	H DECAL BOX		TIN		Concept you upon				0	- 11	10	
		101.4	C Foodland	H WH SED EL		TIN	-	Street caper line	<i>•</i>		and a	-100	- 21	10	
		ECU 5	17 Enabled	H WH SED FE		T 10		Scient sensor			-	-100	Ť	100	
		ECU 6	P Enabled	M WH SPD R		T 10		Sceed sensor			ichi .	-500	1	150	
		EQU 7	FF Enabled	M WH SPD RE		T 10		Speed sensor			nch	-500	Ť	150	
		ECU 6	P Enabled	H. TENGINE		TS		Temperature sen	ace.	- 1	e i	-1-40	T	220	
		ECU.9	P Enabled	M ETC. TELTAL		T 10	10 X	Raw value				0	T	2	
		ECU_10	F Enabled	M_TBO_EST		T 10	10 1	Pressure sensor			1.10	±1-30	T	75	
		ECU_11	F. Enabled	MUTURILIEV		T 21	e	Percentage sens	or .		6.4	0	T	101	
		ECU_12	P Enabled	HURBLIN		T 10	10 25	Percentage sens	OR.		5.1	0	T	101	
		\$CU_13	FF. Enabled	MJNB.J.J		T 10	ne . 25	Percentage sens	or		5.3	0	T	101	
		BCU_14	P Enabled	M. FLEL AVE		T 21	e 2	Percentage sensi	or		5.1	0	T	101	
		ECU_15	FF Enabled	MUPPLUK		T 10	HE 2	Volumetric sensor			100. lege	0	T	5	
		ECU_16	FF. Enabled	M.O.OH.SW		T 10	H2 . 25	Raw value				0	T	2	
		and an	17 Realist	10 101 001		T 10	10	Day vite				0	T	2	
		ECU_17	1+ ELISONO	10,102,000											-

Note about sampling frequency: higher is the total sampling frequency, higher is the memory consume rate. A frequency of 100Hz on a channel means that the value is being sampled 100 times for second. A default sampling frequency value (depending on sensor's type) is present, please consider your needs before changing it. This may impact on the quantity of runs you can store into your **MXL**.

QMs can acquire up to 2000Hz of total sampling (max 500Hz per channel, depending on channel's type: for example, due to their limits, thermocouples cannot sample more than 100Hz).

Some channels need additional information to Properly sample the information. It is the case of the speed channel shown at the top of the list in the above screenshot.



3.3 – System configuration

This tab behaves differently for MXL and EVO3.

Programming the gauge is the main operation for getting the right information at the right place on the display. All the features bound to the display are not shown in the case of an **EVO3**, as they will be displayed in the "Display" tab.

3.3.1 – MXL

🎊 DragOn - version: 1.00.03												_ & ×
File ?												
	MxI QM MxI QM Pro Evo3 QM Evo3	QM Pro										
		Trar	nsmit		Receive							
Go to UMAn		Current configure	ation		1000110							
	B unter Brote 85	Installation	Data logge	Ecu	Vehicle name	Available time	Time with GPS	Total freques	Master fre	Expansions	Video system	Tot. Lambda
	845 32 235 CH_3 326 CH_4 678	STOCK	MXL QM	FORD - MU	DEFAULT	3.32.32 (h	2.22.34 (h	326 (Hz)	326 (Hz)	0 (Hz)	No	0
		·										
Download	Select configuration Channels Sure		CAN-Lambda.com	oficiurator								
			ant cambda cor									1
	AIM sensor Multiply factor	7.1		Shirt Light	1 🙈							
	MOX value	10000		• •								
	ECU signal	10000)	۲							
CAN-net into	Alarm None	over-rev t 0		0	0		- Speed					
	Gear sensor	,		- 0			Channel	ipeed	•			
	None Calcul	ated		✓ [*			Wheel circum	ference 65.	59 (inch)			
nline 📃	Potentiometer Calculated v Channel 8 signal: Cl	ith neutral		9 0	N		/ Pulses per wi	heel revolution	1			
		6										
	Highest gear											
Calibration	HIGH LOW Channel for alarm	Threshold		4 5 6	1 / "cc	ній	H Channel fo	r alarm	Threshold			
	H Channel_1	0 🤴	D HOTCO	GEAR	° 00	/ Ö 🗉	Channel_2		• 0			
	H Channel_3	0 🧕	.845	<u> </u>	23	ίς 🔅 🗖	Channel_4		• 0			
system time	H Channel_5	o 🦉	EH 3	326 6	н Б	18 🧕 🖬	Channel_6	1	• 0			
	W		and the second									
	Measure Sh					MAL	Meacure		Short name			
	Field 1 - always displayed		/			Fiel	d 2 - always dis	played				
Custom sensor	Channel_1	CH_1	/			Cha	nnel_2	•	CH_2			
	Field 3 - page 1	сн з	()-l bb			- Fiel	d 4 - page 1		CH_4			
	Eield 3 - page 2					[d 4 - page 2					
	Channel_5	CH_5	Text			Cha	nnel_6	•	CH_6			

In this tab it is possible to set:

- **RPM** some parameters on the rpm channel.
- Gear sensor where is the channel sampled from and how many gears.
- **Shift light** you can set at which rpm every led couple will flash (you can insert 0 to disable the led or insert the same value to make them flash together).
- **Speed** some parameters on the speed channel.
- Alarms you can choose if and when to have an alarm led flash.
- Welcome text the text that is shown when the MXL is switched on.



3.3.2 – EVO3

💸 DragOn – version: 1.00.04												_ 8 ×
File ?												
	MxI QM MxI QM Pro Evo3 QM Evo3	QM Pro										
Go to QMAn	CLETP	Tra	insmit		Receive							
	avora "	Current configu	ration									
	12	Installation	Data logge	Ecu	Vehicle name	Available time	Time with GPS	Total frequ	Master fre	Expansions	Video system	Tot. Lambda
		DEFAULT	EVO3 QM	None - None	DEFAULT	17.42.33 (7.58.20 (h	131 (Hz)	131 (Hz)	0 (Hz)	No	0
Download	Select configuration Channels Suite		Display L CANJ	ambda configu	untor 1							
	Select configuration Chamles 3938	an coniguration j	Display CARE	ambua cornigu								1
	Rpm	Gear	sensor									
	AIM sensor ECU signa		None		Calculated	Colori	lated gears are					
						availa	ble only when a					
CAN-net info	Multiply factor / 1		Potentiometer Channel 8	Calc	ulated with neuti ignal: Channel 8	ral showin	ig gear display is selected.					
	MAX value 10000	ㅋ 🛛 🦛			-	_						
	,		ECU	Highes	t gear number	6						
T Online	Reference speed											
	Chan Speed_1	•										
12,20												
Cat requisition												
system time												
Lustom sensor manager												

In this tab it is possible to set:

- **RPM** some parameters on the rpm channel.
- Gear sensor where is the channel sampled from and how many gears.
- Reference speed some parameters on the speed channel.

3.4 – Display

This tab is shown only in **EVO3** configuration. It is used to state which is the display connected (choose **none** if you don't have a display) and to set all the display parameters. Available displays will be described from the smallest to the most complete one.



3.4.1 - TG dash

As in the following screenshot no parameter can be set for this display. You just have to tell the system you're using a TG dash but selecting it.



3.4.2 – M3 dash

In this tab it is possible to set:

- **Shift light** you can set at which rpm every led couple will flash (you can insert 0 to disable the led or insert the same value to make them flash together).
- Alarms you can choose if and when to have an alarm led flash.





3.4.3 – Formula Steering Wheel

In this tab it is possible to set:

- **Shift light** you can set at which rpm every led couple will flash (you can insert 0 to disable the led or insert the same value to make them flash together).
- Alarms you can choose if and when to have an alarm led flash.

CragOn - version: 1.00.04	Mxl QM Mxl QM Pro Evo3 QM Evo3 Q	IM Pro		_	_	_					<u>_ 8</u>
Go to QMAn	and a	Transmit Current configuration Installation Data logge DEFAULT EVO3 QM	Ecu Ve None - None DE	eive shicle name FAULT	Available time 17.42.33 (Time with GP 7.58.20 (h.	5 Total frequ 131 (Hz)	Master fre 131 (Hz)	Expansions 0 (Hz)	Video system No	Tot. Lambda O
Download	Select configuration Channels System Available displays For	configuration Display CAN-L mula Steering Wheel	ambda configurator	1							
CAN-net info	Shift Light Led 1 Led 2 Led 3 0 0 0 SHIFT LIGHT = 1 2 3	Led 4 Led 5	Directions Dates 1	L. Channale a	nd alarme	- Disolau page	2. Channels and	d alarme			
Doline			Field 2 Char HIGH None	nnel_2 LED e v 0	Value	Field 2	annel_4 LED ne V 0	Value			
Calibration	LED 1 LED 2 LED 2 LED 2 LED 1 10,100 70° 689° 1.2	20.35 LED 3	Field 1 Char	nnel_1	Value	Field 1 Ch	annel_3	▼ Value			
Set acquisition system time	(AIII)		LOW Non	e 🔽 0		LOW No	ne 🔽 0				
Custom sensor manager											



3.5 – CAN Lambda Configurator

As shown in the AIM Network picture, you can Program the logger to sample the signal of up to 12 lambdas using different **LCU-One** lambda controllers. For every information on **LCU-One** we kindly remind you to visit our website <u>www.aim-sportline.com</u>.

Some versions of the **LCU-One** can be used in connection to the AIM network and (via analog voltage output) to the ECU.

By default, with a brand new configuration, the following screenshot will appear, to remind you that the logger is Programmed not to communicate with any lambda.



You have two possibilities:

- Add Lambda this will add a new sub tab control, shown in what follows, including a general purpose tab and a tab for every LCU-One connected
- **Delete Lambda** this will decrease the sub tab control items



The following screenshot shows you the general purpose tab, named "Lambda controller configuration".

🛣 DragOn - version: 1.00.04		_ 8 ×
File ?		
Go to QMAn	Transmit Receive	
	Current configuration Textualization Data league Enu Valuda paras Auralishis Textualish CTD Table Server, Machene Mada parters Ta	t Lambda
	DEFAULT EVO3 QM None - None DEFAULT 13.34.00 (7.00.31 (h 171 (Hz) 131 (Hz) No 2	c. cambda
	220	
Download	Select configuration Channels System configuration Display CAN-Lambda configurator	
	Addlamhda Dellamhda	
	Lambda controller configuration LC1 LC2	
CAN-net info	Color	options
Conline	Analog output for lambda (or AFR) values	
	Volt, 72	
Calibration	0 0.05 1 1.6 Lambda	2
Set acquisition	(Ark = Air Puerkauu = Poulius or air) pouliu or fuer)	
system time	Use: Lambda AFR	
	Volt vs. lambda curve points	
	1.95 Volt at Lambda 0.65 🛛 🔂 Warmup output: Volt 3 or high impedance	
Custom sensor	4.8 Volt at Lambda 1.6 Error output: Volt 1.5 or high impedance	
manager		
		!

The **LCU-One** correctly measures the lambda value (1 is Stoichiometric, below 1 mixture is rich, above 1 is lean), if you're used to look at the AFR value you'll need to enter the correct multiplier (different fuels have different multipliers).

To Program the LCU-One output (if you don't need that output just leave it as is by default) you just have to enter the two points for the linear conversion:

- 1.95V for lambda at 0.65
- 4.80V for lambda at 1.60

This means for example that with lambda half the way from 0.65 and 1.60, the output voltage will be half the way between 1.95V and 4.80V.

Many people using dyno benches Program it as follows:

- 0.65V for lambda at 0.65
- 1.60V for lambda at 1.60

in order to measure the lambda value directly with a voltmeter.

You can define even the voltages for two LCU-One working conditions:

- warmup: this tipically occurs while the engine has just been revved
- **error**: this tipically occurs with something wrong in the wirings

Choosing "high impedance" no analog output os defined in these cases.



The following screenshot shows the LCU-One tab.

	Mxl QM Mxl QM Pro Evo3 QM	Evo3 QM Pro									
Go to QMAn	(11)	Trar	nsmit	Receive							
·	MOR .	Current configur	ation								
	13	Installation	Data logge Ecu	Vehicle name	Available time	Time with GPS	Total frequ	Master fre	. Expansions	. Video system	Tot. Lam
		DEFAULT	EVO3 QM None - N	lone DEFAULT	13.34.00 (7.00.31 (h	171 (Hz)	131 (Hz)	40 (Hz)	No	2
Download	Select configuration Channels	s System configuration [Display CAN-Lambda co	ofigurator							
	Add Lambda	Del. Lambda									
	Lambda controller configurati	tion LC1 LC2									
CAN not info			L ai								
CAN-net inro	Name of Lambda configuration	ion (15 characters max.)	LC1								
0 Online	Enabled/disabled	Channel name		Sampli	ng frequency	Measure un	it L	.ow scale	H	High scale	
Online	Enabled/disabled	Channel name LC1_Lambda		Sampli T 10 Hz	ng frequency	Measure un	it L	.ow scale).00	۲ ۲	High scale 2.00	
Online	Enabled/disabled	Channel name LC1_Lambda LC1_AFR		Sampli T 10 Hz T 10 Hz	ng frequency	Measure un Iambda .01 A/F .01	it L 0 0	.ow scale).00).00	F T 2 T 2	High scale 2.00 20.00	
Online	Enabled/disabled F Enabled Enabled Disabled	Channel name LC1_Lambda LC1_AFR LC1_Lambda_Temp		Sampli T 10 Hz T 10 Hz T 10 Hz	ng frequency	Measure un	t L ⊻ 0 ⊻ 0	.ow scale 0.00 0.00	T 2 T 2 T 2 T 9	High scale 2.00 20.00 2000	
Doline	Enabled/disabled F Enabled Enabled Disabled Disabled	Channel name LC1_Lambda LC1_AFR LC1_Lambda_Temp LC1_Diagnosys		Sampli T 10 Hz T 10 Hz T 10 Hz T 10 Hz T 1 Hz	ng frequency	Measure un I lambda .01 A/F .01 F F #	it L 0 0 0 5 0 0	.ow scale).00).00 ;00	T 2 T 2 T 2 T 9 T 5	High scale 2.00 20.00 900 5	
] Online	Enabled/disabled	Channel name LC1_Lambda LC1_AFR LC1_Lambda_Temp LC1_Diagnosys		Sampli T 10 Hz T 11 Hz	ng frequency	Measure un Iambda .01 A/F .01 S F K #	t L 1 0 1 0 1 5	.ow scale).00).00 500)	T 2 T 2 T 9 T 5	High scale 2.00 20.00 900 5	
Dnline	Enabled/disabled Enabled Enabled Disabled Disabled	Channel name LC1_Lambda LC1_AFR LC1_Lambda_Temp LC1_Diagnosys		Sampli T 10 Hz T 10 Hz T 10 Hz T 10 Hz T 1 Hz	ng frequency	Measure un Iambda .01 A/F .01 • °F • #	it L V 0 V 0 V 5 0	.ow scale).00).00 ;00)	T 2 T 2 T 9 T 5	High scale 2.00 20.00 900 5	
Donline	Enabled/disabled	Channel name LC1_Lambda LC1_AFR LC1_Lambda_Temp LC1_Diagnosys		Sampli T 10 Hz T 10 Hz T 10 Hz T 11 Hz	ng frequency	Measure un Mambda .01 A/F .01 F # #	t L ▼ 0 ▼ 5	.ow scale).00).00 ;00)	T 2 T 2 T 9 T 9	High scale 2.00 20.00 900 5	
Calibration	Enabled/disabled	Channel name LC1_Lambda LC1_AFR LC1_Lambda_Temp LC1_Diagnosys		Sampli T 10 Hz T 10 Hz T 10 Hz T 1 Hz	ng frequency	Measure un ★ lambda .01 ★ A/F .01 ★ 9F ★ #	t L 2 0 2 0 5 0 0	.ow scale).00).00 ;00)	T 2 T 2 T 2 T 5	High scale 2.00 20.00 900 5	
Calibration	Enabled/disabled Enabled Enabled Enabled Disabled Disabled	Channel name LCI_Lambda LCI_ARR LCI_Lambda_Temp LCI_Diagnosys		Sampli T 10 Hz T 10 Hz T 10 Hz T 10 Hz T 1 Hz	ng frequency	Measure un Measure un A/F .01 C F #	t L 2 0 2 0 5 0 0	.ov scale 00 00 .00	 	High scale :00 :0.00 :000 5	
Colline Collibration Set acquisition system time	Enabled/disabled F Enabled Enabled Disabled Disabled	Channel name LC1_Lambda LC1_AFR LC1_Lambda_Temp LC1_Diagnosys		Sampli T 10 Hz T 10 Hz T 10 Hz T 10 Hz T 1 Hz	ng frequency	Measure un ■ lambda .01 ■ A/F .01 ■ °F ■ #	t L ⊻0 ⊻5	.ov scale 00 00 .00	T 2 T 2 T 2 T 5 T 5	High scale 2.00 20.00 000 5	
 Online Calibration Set acquisition system time 	Enabled/disabled	Channel name LC1_Lambda LC1_AFR LC1_Lambda_Temp LC1_Diagnosys		Sampl T 10 Hz T 10 Hz T 10 Hz T 10 Hz T 1 Hz	ng frequency	Measure un Measure un A/F .01 F # #	t L 20 20 20 0	.ow scale 0.00 0.00 000)	T 2 T 2 T 3 T 5	High scale 2:00 20:00 000 5	
Calibration	Enabled/disabled Enabled Enabled Enabled Disabled EDisabled	Channel name LC1_Lambda LC1_AFR LC1_Lambda_Temp LC1_Diagnosys		Sampl T 10 Hz T 10 Hz T 10 Hz T 10 Hz T 1 Hz	ng frequency	Measure un Iambda .01 A/F .01 F #	t L 2 0 2 0 2 0 0	.ow scale 0.00 0.00 000)	T T T T S T S	tigh scale 2,00 20,00 900 5	
Colline Collibration Set acquisition system time	Enabled/disabled F Enabled Enabled Disabled Disabled	Channel name LC1_Lambda LC1_AFR LC1_Lambda_Temp LC1_Diagnosys		Sampl T 10+tz T 10+tz T 10+tz T 10+tz T 10+tz	ng frequency	Measure un iambda .01 A/F .01 F # #	k L C	.ow scale 0.00 0.00 0.00 0	T 2 T 2 T 3 T 9 T 9	fligh scale 200 20.00 2000 5	
Calibration Set acquisition system time	Enabled/disabled F Enabled Disabled Disabled	Channel name LC1_Lambda LC1_AFR LC1_Lambda_Temp LC1_Diagnosys		Sampl T 10 Hz T 10 Hz T 10 Hz T 10 Hz T 1 Hz	ng frequency	Measure un ▲ lambda .01 ▲ A/F .01 ■ ↔ #	k L () () () () () () () () () () () () ()	.ow scale).00).00)00)	T 2 T 2 T 2 T 5 T 5	fligh scale 2000 20.00 2000 5	
 Online Calibration Set acquisition system time Custom sensor manager 	Enabled/disabled Image: Construction Image: Construction	Channel name LC1_Lambda LC1_AFR LC1_Lambda_Temp LC1_Diagnosys		Sampl T 10 Hz T 10 Hz T 10 Hz T 10 Hz T 1 Hz	ng frequency	Measure un ■ lambda .01 ■ A/F .01 ■ 4/F .01 ■ 4F ■ 4F	k L 2 0 2 0 2 0 0 0 0	.ow scale 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.0	ן 2 ד ב ד ד פ ד פ	High scale :00 :00.00 :000 :	
 Online Calibration Set acquisition system time Custom sensor manager 	Enabled/disabled F Enabled Disabled Disabled Disabled	Channel name LCI_Lambda LCI_AFR LCI_Lambda_Temp LCI_Diagnosys		Sampl T 10+fz T 10 +fz T 10 +fz T 10 +fz T 11 +fz	ng frequency	Measure un ■ lambds .01 ■ A/F .01 ■ 9F ■ 9F ■ #	k L 3 0 2 0 2 0 0 0 0	.ow scale 1.00 0.00 000)	T T T S T S T S	tigh scale :00 20.00 :00 5	
Calibration Calibration Set acquisition system time Custom sensor manager	Enabled/disabled Enabled Enabled Disabled Disabled	Channel name LC1_Lambda LC1_AFR LC1_Lambda_Temp LC1_Diagnosys		Sampl T 10 Hz T 10 Hz T 10 Hz T 10 Hz T 1 Hz	ng frequency	Measure un ▲ Iambda 01 ጃ A/F 01 ッ 약 ጃ ≠	k L	.ow scale 1.00 0.00 000)	1 2 2 1 1 9 1 9	fligh scale 200 000 000 5	

Every **LCU-One** you connect is seen as a set of four additional channels, you will normally choose one of the first two channels (lambda or AFR) and, in case you want to check the sensor usage, you will enable one or both the other two.

Lambda temperature is measured right where the sensing part of the Probe is, and can ensure it is Properly working within the correct range. Lambda diagnosis can be used to check if the measure is in error, but this doesn't happen if everything is OK in the wirings.



Chapter 4 – Race!

Now you're ready to race! After the burnout, before the staging phase, turn your data acquisition switch on. Your **MXL QM** will not start data recording while the data acquisition is switched off. When race's over, turn off the acquisition switch, connect the USB cable to your **MXL** and download data to your PC as explained in the following chapter. Then you will analyze your performance in detail through the QMAn software.



Chapter 5 – Download

The download Procedure will allow you to transfer acquired racing data to your PC for later analysis. Data download is possible by running both QMAn or DragOn software.

5.1 – QMAn

- Connect your **MXL QM** to your PC by using the USB cable. The **MXL** must be turned on.
- Run QMAn software
- Click the "Download" button on the toolbar.

The following window appears (download window will be described after):

QMAn 1.00.04 - [Test/Run manage File Data Personal Selection View O	e r] ptions ?	-	_				_ <u>_ </u> _ ×
Download Configuration Preferences	Load Ur	load Proper	Ø♠ Ø♦ ties Import Expo	rt Remove Hide	▼ E-mail		(III)
Dest/Run manager				[m. v. v. [m. tv	[n [u.	[[m] [
Championship/Track	Run name		Date and time	Reaction time Elapsed time	Run type Notes	Path	hie name
- Sample	Run 3 - 0.000	0 (29102007_008	Mon 10 29 07 - 11:27 AM	0.0000 0.0000	Time Trial Insert here your run comments.	C:\Programmi\AIM\DRAGSTER_SUITE\DATA\	29102007_008.drk
None	Run 2 - 0.000	0 (29102007_007) Mon 10 29 07 - 11:27 AM	0.0000 0.0000	Time Trial Insert here your run comments.	C:\Programmi\AIM\DRAGSTER_SUITE\DATA\	29102007_007.drk
	Run 1 - 0.000	0 (29102007_006) Mon 10 29 07 - 11:26 AM	0.0000 0.0000	Time Trial Insert here your run comments.	C:\Programmi\AIM\DRAGSTER_SUITE\DATA\	29102007_006.drk
E Past Year	Run 3 - 0.000	0 (29102007_002) Mon 10 29 07 - 11:27 AM	0.0000 0.0000	Time Trial Insert here your run comments.	C:\Programmi\AIM\DRAGSTER_SUITE\DATA\	29102007_002.drk
Past 3 Months	Run 2 - 0.000	0 (29102007_001) Mon 10 29 07 - 11:27 AM	0.0000 0.0000	Time Trial Insert here your run comments.	C:\Programmi\AIM\DRAGSTER_SUITE\DATA\	29102007_001.drk
E Past Wook	Run 1 - 0.000	0 (29102007)	Mon 10 29 07 - 11:26 AM	0.0000 0.0000	Time Trial Insert here your run comments.	C:\Programmi\AIM\DRAGSTER_SUITE\DATA\	29102007.drk
E Past Week	Download 1.	0.04 - MXL QM					
I Today	-						
+ Personal Selections Edit	- 🗁 Choose	e folder	rogrammi(AIM)DRAGSTER_S	UTE(DATA)			
			w> <month><year (="")="" vvvv=""></year></month>	».drk			
		e Name					
		Select all	Deselect a				
	N Sel.	Downl D	ate of Run	Starting Time of Run	DRK file name		
	1		October 29, 2007	11: 26: 42		Т	
	2		October 29, 2007	11: 27: 10		T	
	3		October 29, 2007	11: 27: 47		T	
	4	0	October 29, 2007	11: 31: 15	29102007_003.drk	T	
	5 2	~	October 29, 2007	11:31:38	29102007_004_drk	—	
		0	Debelar 29, 2007	11, 31, 35	20102007_00F.du		
	-	_	Operation in progre	855			· · · · · · · · · · · · · · · · · · ·
					0%		
				1			
	Clear data	logger memory	🔲 Erase all data from logger	r at the end of download	🚬 Download <u>s</u> elected 🚽 🔩	<u>C</u> ancel	
	ų						

Select the runs you want to download by flagging the related checkbox then click the "Download selected" button. The cyan row indicate that the run is new and hasn't be downloaded yet.



5.2 – DragOn

- Connect your **MXL QM** to your PC by using the USB cable. The **MXL** must be turned on.
- Run **DragOn** software
- Click the "Download" button on the left bar.

The following screen appears:

DragOn - v	version: 1.00.03														
le ?															
		мирм	VixI QM Pro	Evo3 QM Ev	o3 QM Pro 1										
		uniden 1.													
-					Tre	nomit)	Pagaina							
	Go to QMAn		61944 A		116	nsiint		ieceive							
			53438	1/-55	Current configu	ration									
				226	Installation	Data logge	Ecu	Vehicle name	Available time	Time with GPS	Total frequ	Master fre	Expansions	Video system	Tot. Lambda
			45 32	U U 670	STOCK	MXL OM	FORD - MU	DEFAULT	3.20.15 (h	2.16.56 (h	346 (Hz)	326 (Hz)	20 (Hz)	No	1
			•												
—	Download	Select cr	onfiguration	Channels Sy	stem configuration	CAN-Lambda co	onfigurator								
		-	1					\/	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~						
			New		Delete	C	lone	Imp	ort	Expor	t				
								()							
		N	Installation	name	ECUM	lanufacturer		ECU Model			Vehicle name		Created		Tot, Lambda
1 39	LAN-net info	1	STOCK		T FORD			MUSTANG 20	05/07		DEFAULT	Т	October 24, 2	007	1
									14						
		Dou	upload 1.00	02 MVI 0M											
1			Anioau 1.00	103 - MAL QM											
Ę l	Online		Choose f	folder C:	\Programmi\AIM\DR	AGSTER_SUITE\	DATA								
		a				(), II									
_		S 1	DRK File	Name <)ay> <month><yea< td=""><td>r (yyyy)>.drk</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></yea<></month>	r (yyyy)>.drk									
1-															
7 .	Calibration	SZ III	Sel	lect all		Deselect all									
									-						
_		N	Sel.	Downloade	d Date of Ru	n	Star	ting Time of Run	DRK file nam	e					
-	Cat annuisition	1		0	Today		11:	26: 42	29102007.dr	k					
1 🛞	system time	2		0	Today		11:	27: 10	29102007_0	D1.drk					
		3		0	Today		11:	27: 47	29102007_0	02.drk					
		4		0	Today		11:	31: 15							
		5		0	Today		11:	31: 38							
		6		0	Today		11:	33: 25							
	Cuetom concor														
	manager														
								_							
					Operatio	n in progress									
									0%						
)											
		No	Clear dataloo	gger memory	Erase all data I	rom logger at th	ne end of downl	oad R	Download <u>s</u> e	ected	<u>C</u> a	ncel			
								_				_			

Select the runs you want to download by flagging the related checkbox then click the "Download selected" button. The cyan row indicate that the run is new and hasn't be downloaded yet. After the download click "Go to QMAn" on the top of the left bar to switch to analysis software.



5.2.1 – Download window

The download window could be preceded by the following small window stating that the software is waiting for a logger to be connected. As soon as one is connected the main download window will be Prompted.

1.00.04		×
Looking for a co	nnected lo	gger
		<u>C</u>ancel
	1.00.04 Looking for a co	1.00.04 Looking for a connected lo

Please kindly notice that the normal Procedure is:

- connect a logger;
- switch the logger on;
- perform download operation through the following window, in which you can see some command buttons and a list of runs available for download. Normally all the runs available are selected for download, you can choose to download only some of them and the command buttons named **Select All** and **Deselect All** are there to help you in this Process.

👱 Download 1.00.04 - MXL QM 📃 🗆 💟										
	Choose folder D:\vari_drk\071114\01\									
DRK: File Name CloggerType> <day><month><year (="")="" yyyy="">_<test number="">.drk</test></year></month></day>										
Ø	_	Select	all		Deselect all					
N	Sel.	Do	Date of Run		Starting Time	Logger Type	Logger ID	Run	DRK file name	
1	17	C	Today		12: 21: 13	MXL QM	12345	1	MXL QM07012008_1_003.drk	T
2	1	C	Today		12: 22: 04	MXL QM	12345	2	MXL QM07012008_2_003.drk	Т
3	1	0	Today		12: 22: 23	MXL QM	12345	3	MXL QM07012008_3_003.drk	Т
				Opera	ation in progress.					
							_	0	%	
S.	Clear di	atalogge	r memory	Erase all dat	ta from logger at	the end of downlo	ad 🛃	Downloa	ad <u>s</u> elected	

The choose folder button lets you customize the download file location.

The DRK File name button lets you tailor the naming of all the downloaded drk files.

If you flag the checkbox named "Erase all data from logger at the end of the download" the memory of the gauge will be completely emptied, so you will not flag it if you want to download from the same gauge on multiple PCs.

Download selected button will start the download Procedure while the *Cancel* button will exit this window without downloading anything.



For every drk file you're creating the following window is automatically Prompted. Here you can set the names of track, driver, championship and vehicle. After one download these names are automatically inserted by the software, recognizing the gauge that is connected to the PC, so you may decide to flag the checkbox "Use following settings for all the drk files that are going to be generated".

🙎 Te	👱 Test information setting 1.00.04 🛛 🛛 🔀							
MXL	.QM07012008_1_002.drk							
v u	Ise following settings for a	I.drk files are going	to be generated.					
2	Track:	drag1			•		Add / Modify	
3	Vehicle:	None			•		Add / Modify	
	Driver:	None			•	-	Add / Modify	
2	Championship:	drag4			•		Add / Modify	
4	Test comments:							
		1						
			\sim	<u>0</u> K				



Chapter 6 – Analysis

Analysis is fundamental to set up your vehicle. You will analyze your racing data using the included **QMAn** software. This chapter describes how to use **QMAn** in order to obtain the maximum amount of information from the test file. This software has been designed focusing our attention on usability and ease of use, minimizing the number of clicks it takes for you to get the information you need, and get it quickly.

6.1 – Test/Run manager

Once you run **QMAn**, the following screenshot will appear. It features a toolbar, a left and a right part. The right part shows you the runs you already downloaded to your PC. The left part lets you refine the list of runs displayed on the right part.

🛛 🕅 MAN 1.00.04 - [Test/Run manager]							
File Data Personal Selection View Options ?							
Download Configuration Preferences	Load Unload Property	β● β● Import Export	Remove Hide	• 🔽 E-mail		(AID
U Test/Run manager							
Championship/Track	Run name	Date and time Re	action time Elapsed time	Run type	Notes	Path	File name
C T Sample	TR1 (Run One - Sample Data 1)	Sat 11 08 03 - 07:10 PM	0.5370 8.1450	Time Trial	Insert here your run comments.	C:(Programmi(AIM)DRAGSTER_SUITE(DATA)Sample)	Nov8JTR1.drl
None	First Round (Sample Data 2)	Set 11 08 03 - 11:22 PM	0.5440 8.2170	Elimination Run	Insert here your run comments.	C:(Programmi)A3M(DRAGSTER_SUTTE)(DATA);Sample)	Nov0E18.drk
10 10 10 10 10 10 10 10 10 10 10 10 10 1							
E Past 3 Multis							
E Part Month							
Past Week							
Yesterday							
Today Today							
Personal Selections Edit	1						
							_
	x						<u> </u>

Available commands are:

- **Download** as already explained this opens the download window.
- **Configuration** it runs the DragOn software.
- Preferences opens a window in which software preferences can be set.
- Load loads the selected run/s for analysis (it is enabled only if non of the selected runs are loaded).
- **Unload** unloads the selected runs (it is enabled only if all the selected runs are already loaded).
- Properties opens a window that lets you modify some run file Properties.
- Import lets you add some run files to your run database from an external file.
- **Export** lets you export some run files from your run database (e. with the aim to move them to another PC).
- **Remove** removes a run from the database.
- **Hide** hides a run from the database.
- **E-Mail** lets you send some runs by e-mail.



Because of the large number of runs that you will acquire during your racing time, we give you the possibility to choose and group runs following your preferred and customizable Criteria or Selection (Time, Racer, Track, Championship, Vehicle).

As shown in the previous screenshot, the "Test/Run manager" layer is divided into 2 separate parts: on the left it is shown the track name (left click on the track name to select the desired one) while on the right there's a list of all the runs which belong to that track.

In order to load a run for analysis, you may

- double click on the desired one;
- select one run and click the "LOAD" button in the upper toolbar;
- select the desired run, right click and choose the "LOAD" command in the context menu.

QMAn has been designed to share data easily. If you need to share test or run file data, you may **send the file via e-mail** by just clicking one button. Go to "Test/Run Manager" layer and select the test you wish to send among the available one. The selected file will become red-highlighted.

Now, before sending the DRK file, please ensure that your PC is connected to Internet and, then, press button "E-mail" (located inside the button toolbar). By default, the recipient's address will be an AIM email address, just change it with the recipient you want send .drk files to.

In case you need assistance from AIM, just select the "Send files by e-mail to AIM" option. We will receive just the test file and logger information. No personal data will be sent to us. Please remember to write in the e-mail text the reason you're sending data for, we'll reply you as soon as possible.

NOTE: it is reminded that you may not send a file if it is loaded. In this case, please unload it and, then, send it via e-mail.



If you want **set software preferences**, please close all open tests and select "Preferences" from the top toolbar. The following picture will appear.

Run length	rVef	nicle type
C 330 feet	0) Junior dragster
🔿 1/8 mile	(Full scale dragster
1/4 mile	0	Snowmobile grass drag
🔿 500 feet		
Team		
Name	To insert your name here use menu F	ile->preferences.
Information	To insert information here use menu	File->preferences.
Logo		
		No Picture
		Choose Picture

Please choose the correct **run length** and **vehicle type**, as many features in the software were specifically developed for different lengths and vehicles.

You can also have a slight customization of software printouts inserting your name, some team information and your team logo.



6.2 - Analysis View

Once a run has been loaded, it will be Prompted the "Analysis View" window, shown in the screenshots that follow along this chapter. There are up to 8 Analysis View available, any of them is customizable independently from others, hence enabling you to have different analysis templates always available. The default name for each view is "Time View", it can be changed through the plot settings command, as explained later.

Again the view has a toolbar, a left part and a right part, showing new information, both the left and the right part are divided in sub windows, described in what follows.

The left part of the toolbar is the same already described. Available commands in this view are:

- **Channels** to modify run channels Properties.
- Settings to modify plot settings Properties.
- **Plot type** to choose which kind of plot you want to display.
- **Zoom In** to move the analysis to a shorter time window.
- Zoom Out to move the analysis to a longer time window.
- **Displacement** to change channels displacement on the plot.
- **Prediction** to plot, when available, an ET prediction, useful for bracket racing.

Three different types of plot graph are available: Time, XY and Histogram; clicking on the Plot type toolbar button you can switch between each other.

We'll be immediately explaining the Time Plot graph, to follow later with XY and Histogram. What is similar in the three graphs will be explained only for the Time Plot one. As a matter of fact the left part, including the channels list, the time slip, the weather information and the 3D settings is in common between the three graphs. The same can be said on the bottom part with the run history.



6.2.1 – Time Plot

The "Time plot" feature allows the user to plot a logged channel versus time. Left click inside the graph to show a vertical cursor. Along the horizontal axes it will be shown the time and distance (calculated from the start line) value corresponding to that position. At the top right part of the graph the value tags of the shown measures are displayed. The background of the plot is greyscale coloured in order to evidence the time slip times.

At the top of the window it is possible to see a tab control with the leftmost tab named "Run Compare", and a tab for every loaded run. Selecting any runs tab the view will show only the data of that particular run, selecting the Run Compare tab you'll be able to see at the same time the data of up to 2 runs.



The user may choose the channel to be plot on the graph left-clicking on the channel name inside the "channels list" window (located in the upper left corner of the "Time plot" window).

Moreover, the measurements displayed inside the "available measurements" toolbar are linked to the cursor movement, showing the current value corresponding to the selected track position.

In order to plot the scale together with the input channel, please enable the checkbox aside the desired channel inside the "channels list" toolbar.



Clicking on the *Displacement* toolbar button it is possible to choose how to display the channels into the plot, you'll use the small button with numbers in the channels list window to decide where to place every channels. In the following screenshot an example in which we placed RPM and shaft speed at the top and two temperatures at the bottom.





Clicking the small coloured button close to every channel name it is possible to choose the plot colour of the channels itself. The click on the colour button Prompts the following window.



In the lower part of the "Time plot" window it is displayed the "Run toolbar", which is a graph showing the complete time history of the loaded run.

User may drag and drop the black square drawn inside the "Run toolbar": the graph displayed inside the "Time plot" window will move together with the dragged window. The black square evidences what shown in detail in the upper part of the plot.

When in Run Compare mode the run history bar displays two separate black squares, one for every run. Users normally drag them together, as stated by the *Tie* command check button in the right part of the run history. Unchecking the Tie button you'll be able to fine align runs that eventually are not correctly recognized by the software.



The width of the data window can be modified, you may click the 2 buttons located inside the buttons toolbar. QMAn allows the user to choose among 7 predefined zooms: 2 seconds window, 4, 6, 8, 10, 14 and 20 seconds. For instance, if you were looking a graph inside a 10 seconds window and you click the "Zoom in" button, the "Time plot" will change to an 8-seconds window.



You can zoom either using the up-down arrows buttons on your keyboard or through the mouse wheel when the mouse cursor is over the plot.

Plot settings can be modified through the **Settings** command in the toolbar. The following window is Prompted. Kindly notice that there are parts of this window that are different for XY graphs and Histogram graphs, they will be explained later.

Plot settings	×
Profile name:	Select plot type and features
Time View	Time XY Histo
Colors Def. White Def. Black Graphic object View Print Plot background Plot grid Plot grid Plot cursor Image: Color of the second se	Line width 3 Cursor tags None Cursor tags Show Shift RPM Show Rpm / Shaft 1:1 Show Car reaction time
Shown channels RPM EGT SHAFT CHT Speed CVT Drive	
Linear	Per Run Color Use 3D Channel
	RPM A EGT EGT SHAFT CHT CHT CHT Speed
	Apply Cancel OK

It is possible to set the view name, defaulted to "Time View".

It is possible to modify the colours of the graph objects that are not bound to channels, and it is given the possibility to go back to defaults, with black or white background. Different backgrounds are managed for printing and for view, as usually printouts have white background.

The channels shown in the channels list already described can be sorted, this is a useful feature when a huge number of recorded channels (typical of several applications of the **EVO3** or **MXL**) are logged for every run. This way you'll be able to use different views to plot different information, always ready for a quick interpretation of data.

Line width settings refer to channels traces.

Cursor tags refers to the cursor drawing around the line plotted for every channel.

Enable time interval bolding refers to the gray scaled background of the time plot.

Show shift RPM is useful while displaying some Junior Drasters data, the same for Show RPM / Shaft 1:1.

Show Car reaction time enables the drawing on the time plot of a vertical dashed red line evidencing it.



Per Run Colour is useful when comparing two runs, all the channels pertaining to a run will have the same colour, making it easy to identify them.

The Use 3D channel lets you plot channels' lines using a colour that is not the colour chosen for that channel, but instead a colour bound to a third channel value through a colour scale shown in the bottom left part of the view.



Double click the 3D colour scale to show its settings window.

3D Channel Settings		×
✓ Use 3D Channel		
RPM EGT SHAFT CHT Speed CVT Drive Band number > 8400 7800 < 8400 7200 < 7800 6600 < 7200 6000 < 6600 5400 < 6400 4800 < 5400 3600 < 4200 < 3600	✓ Use 'greater than max' ✓ Use 'lower than min' Use default colors App Canc OK	ly :el

Through this window it is possible to set the bands number and the bands thresholds.



6.2.2 – Histogram

While showing a histogram plot you'll be able to see how long a channel remains within a certain band. In the following screenshot the RPM histogram, that lets you understand which are the most used RPM in the run, allowing you a better engine tuning.

Kindly notice that while moving the mouse cursors over a bar on the plot a tag will show you the value of the bar.





The next screenshot shows you that the parameters that can be set for this plot are the histogram computation base (time or percentage) and the beans number.

Plot settings	2
Profile name:	Select plot type and features
Time View	Time XY Histo
Colors Def. White Def. Black Graphic object View Print Plot background Pint Plot grid Pint Plot ursor Pint Steed Pint Shown channels Move Up EGT Move Up ShAFT Move Down CVT Drive Linear Move Down	Histogram type Time Time Percentage Beans number 6 7 8 9 10 11 12 13 14 15 16 Per Run Color Use 3D Channel
	SHAFT CHT Ispeed
	Apply Cancel OK

Even the histogram plot can show a 3D channel. In this case, within a single horizontal bar you can see multiple sub bars with different colours, the amplitude of each sub bar lets you understand a distributed histogram of the 3D channel.





6.2.3 – XY Plot

The XY plot or scatter plot shows the traces of the enabled channels versus one selected X channel. If you check the *Cursor* button in the run history bar you can move the cursor within the run history bar and see what happens inside the XY plot. In this "cursor movement" mode the drag and drop functionality of the time window doesn't work: just unckeck the cursor button and the drag and drop mode will be back.





The next screenshot shows you that the settable parameters of the XY plot are the horizontal axis channel and the drawing mode: lines, dots or circles (and their dimensions).

The XY plot lets you show a 3D channel as well as the other two plots.





6.2.4 – C hannel info

There are a number of parameters that can be modified for each channel, you may right click on the channel name inside the "Available measurements" toolbar or click the "Channels" button inside the buttons toolbar. The "Set Channels" window (shown here) will be displayed.

Set Channels	×
EGT SHAFT Channel SHAFT CHT	name: RPM rate: 20 Unit of measure: rpm
Speed CVT Drive Linear	Cale Min 0 Max 10500
Value = A = 1	Value x A) + B B = 0 Number 1
Max. RPM Modified	rs f pulses per engine /1 value 0 value 0
Paramete	not used.

If you change the plotting scale you'll generate a redraw of the graphs as soon as you close this settings window. Changing the plotting scale value will allow you to modify the graph's higher and lower limit.

If you enable an alarm and Properly set its threshold you'll see a red coloured background for the channel values (only in case the alarm is hit) in the channels list window.

The other parameters affect the channel value and behave differently sensor by sensor, normally nothing has to be changed in these values.



6.2.5 – How to set the time slip info

Once the time slip have been handed to the racer. QMAn has been designed to allow you to insert useful data (reaction time, $60' - 330' - 1/8^{th} - 1000'$ and $1/4^{th}$ time, 330' - 660' and 1320' speed) inside the test file in order to recall them when needed.

In case you selected a shorter run length in software preferences (already described) the higher distances settings (say 1320 time and speed, ...) will not be shown.

Run Performance				×
Time of Day	07:10 PM			
Lane	🖲 Left	C Right		
Dial In Time	8.1400			
Reaction Time	0.5370			
60' Time	1.6890			
330' Time [60' to 330']	3.0890	1.4000		
1/8th Time [330' to 660']	5.1450	2.0560		
1000' Time [660' to 1000']	7.2389	2.0939		
1/4th Time [1000' to 1320]	8.5419	1.3030	Car Reaction Time	0.274
330' Speed	0.00			
660' Speed	78.74			
1320' Speed	0.00			
Comments				
Insert here your time slip co	mments.			
				OK Cancel

These settings affect the gray scaled backgrounds of the time plot.



6.2.6 – How to set weather station data

The user is allowed to set the weather conditions, in order to be able to correlate the test performances (reaction time, linear acceleration, engine's setup) even to the atmospheric conditions.

If you wish to set weather parameters, please press the "..." button aside of the "Weather" toolbar (left column) or double click the Weather window.

_

Weather conditi	on			×
		~	<u>90</u>	
C Sunny	Partially Cloudy	C Cloudy	C Rainy	
Temperature			70.0	
Humidity			0.00	
Barometer			0.00	
Wind speed			20.00	
Wind direction			45	
Corrected Air Fa	tor		0.000	
Density Altitude			0.0	
Air Density Ratio			0.000	
Dew Point			0.000	
Comments				
		OK	Cancel	1
		L		_



6.3 – Test Loaded View

This view shows a report form of all the information bound to every run loaded for analysis. If you red-highlight a line of a run you can click on one of the toolbar buttons to open the settings window already shown and that will be rapidly summarized in the following lines.

The view has a toolbar and a bottom part containing the report itself.

The left part of the toolbar is the same already described. Available commands in this view are:

- **Run Info** to modify run settings.
- **Time Slip** to modify time slip settings.
- Tachometer to modify tachometer settings.
- Weather to modify weather settings.

The reports easily self describes: the first column includes the descriptions, then you'll see one column for each run you load.

👹 QMAn 1.00.04 - [Test loaded]			
Ele Data Personal Selection Vier	w Options 2		
2 🚫 🗄	. 🐡 🗖 🖸	🚔 🗖	(Auri)
Download Configuration Print pr	eview Print Run Info Time Slip	Tachometer Weather	
🕒 Test/Run manager 🕒 Time 🕯	/iew 🕒 Time View 🕒 Time View 🕒 Time	View C Time View C Time View C Time	View 🕒 Time View 💕 Test loaded
- Constal information			
Date / Time	Set 11.00.2003	Set 11.08.2003	
- Event	Time Trial	Elimination Run	
- Run name	TRI	First Round	
- Drive gear teeth	14	13	
- Driven gear teeth	96	90	
- Wheel circumference	[inches]	[inches]	
Comments	Insert here your run comments.	Insert here your run comments.	
- Run performance			
Time of Day	07:10 PM	11:22 PM	
Lane	Lert	Left	
- Reaction	0.5170	0.1000	
	1 6890	1.6970	
- 330'	5.0890 [3.4000]	5.1140 [3.4170]	
	8.1450 [3.0560]	0.2170 [3.1030]	
- 1000'	0.0000 []	0.0000 []	
1/4th mile ET	0.0000 []	0.0000 []	
- ET prediction	not possible	0.8208 [77.99]	
-330' mph	0.00	0.00	
	78.74	75.46	
- 1/sth mph	0.00	0.00 Teach berg unter line die commonie	
Markers' value	[n], [co], [220], [con], [1000], [1220]	[0] - [60] - [200] - [660] - [1000] - [1220]	
RPM	[0] [00] [000] [000] [1000] [1000]	[0] [00] [000] [000] [1000] [1000]	
EGT			
- SHAFT			
🔁 онт			
- Speed			
- CVT			
Drive			
Tarbandar confige			
Maximum rrm	0	8082	
Maximum temp: Cvl head	0.00	206.46	
- Maximum temp: EGT	0.00	1240.35	
Comments	Insert here your run readings comments.	Insert here your run readings comments.	
🖻 🤁 Settings			
- Launch: Cyl head temp	154.40	131.00	
- Launch: Exhaust temp	693.69	665.47	
- Launch: rpm	3617	3693	
Tire pressure (both)	0.00	0.00	
Contracts	arsert nere your run settings comments.	inserchere your run settings comments.	
a word drawting	200	140	
- Wind speed	7.00	4.80	
- Weather	Partly Cloudy	Cloudy	
Temperature	60.5	62.0	
- 🔄 Hunidky	0.00	0.00	
Barometer	0.00	0.00	
Corrected air factor	0.000	0.000	
Density abitude	0.0	0.0	
Air density ratio [%]	0.000	0.000	
Dev pork [degrées]	Inset here us a meather information comments	Inset here your weather information community	
Contorio	more there your measurer machinologi commerces.	source your weather internation comments.	
1			



6.3.1 – Run Info

This window lets you enter general information on the performed run.

General Information	×
Event date	5at 11 08 2003
Run type	 Time trial
	Qualification
	C Elimination
Run name	TR1
Drive gear teeth	14
Driven gear teeth	96
Wheel circumference	[inches]
Comments	
Insert here your run comments.	
	OK Cancel



6.3.2 – Time Slip

You can store all the information bound to the time slip, that, as already explained, affect the time plot.

Run Performance				×
Time of Day	07:10 PM			
Lane	• Left	C Right		
Dial In Time	8.1400			
Reaction Time	0.5370			
60' Time	1.6890			
330' Time [60' to 330']	5.0890	3.4000		
1/8th Time [330' to 660']	8.1450	3.0560		
1000' Time [660' to 1000']	0.0000			
1/4th Time [1000' to 1320]	0.0000		Car Reaction Time	0.274
330' Speed	0.00			
660' Speed	78.74			
1320' Speed	0.00			
Comments				
Insert here your time slip co	omments.			
<u> </u>				
				OK Cancel

6.3.3 – Tachometer

You can store all the readings of the tachometer that matter most, even at launch.

Settings and Tach Readings			×
Readings			
Max rpm	3	Comments	
Max cylinder head temperature	0.00	Insert here your run readings comments.	
Max exhaust temperature	0.00		
Launch			-
Rpm	3617	Comments	
Cylinder head temperature	154.40	Insert here your run settings comments.	
Exhaust temperature	693.69		
Tire pressure	0.00		
		OK Cancel	



6.3.4 – Weather

You can remember all the important information coming from a weather station.

Weather conditio	n		2	۱
1	*	-		
C Sunny	Partially Cloudy	C Cloudy	🔘 Night	
Temperature			<u>58.5</u>	
Humidity			0.00	
Barometer			0.00	
Wind speed			7.00	
Wind direction			200	
Corrected Air Fact	or		0.000	
Density Altitude			0.0	
Air Density Ratio			0.000	
Dew Point			0.000	
Comments				
Insert here your	weather information comm	nents.		
		ОК	Cancel	



Appendix "A" – Technical draws

A.1 – MXL/EVO3 QM Pista: AMP female connector

Pin	Signal	Pin	Signal	Connector draw
1A	GND	1B	Analog input 4	
2A	9-15V Battery input	2B	V reference	
ЗA	CAN 1- (ECU interface)	3B	Analog GND	6 5 4 3 2 1
4A	CAN 1+ (ECU interface)	4B	Analog input 3	12 11 10 9 8 7
5A	RS232 TX (ECU interface)	5B	Analog input 2	
6A	RS232 RX (ECU interface)	6B	V reference	
7A	USB D-	7B	Analog GND	
8A	RPM 150-400V coil - RPM square wave >8V	8B	Analog input 1	12 Pins AMP female connector pinout (Labelled as "A") – Contacts insertion
9A	+ VB	9B	Analog input 8	view
10A	GND	10B	USB D+	
11A	+ VB	11B	Analog GND	
12A	Speed	12B	Analog input 7	
		13B	Analog input 6	87654321
		14B	V reference	16 15 14 13 12 11 10 9
		15B	Analog GND	16 Pins AMP female connector pinout
		16B	Analog input 5	(Labelled as "B") – Contacts insertion view

C-Acquisition switch channel

D-CAN for Expansion Modules

Pin	Function	Pin	Function	Pin	Function	Pin	Function
1	Reserved	3	Reserved	1	CAN 0+	4	CAN 0-
2	GND	4	Start acquisition switch	2	GND	5	9-15V Battery input
				3	+VB		



4 Pins female Binder connector pinout (Labelled as "C"): external view



5 Pins female Binder connector pinout (Labelled as "D"): outside view



A.2 – MXL QM Pro: 22 Pins Deutsch connector

Kindly notice there are some differences from EVO3 wirings, evidenced in red.

Pin	Signal	Pin	Signal	Connector Draw
1	+ VB (50 mA max)	12	GND	
2	GND	13	+ VB for Ext. exp. modules (350 mA max)	$ \begin{array}{c} 2 \\ 3 \\ 15 \\ 21 \\ 12 \end{array} $
3	CAN 0+ (Ext. exp. modules)	14	MEM	$\begin{array}{rrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr$
4	CAN 0- (Ext. exp. modules)	15	VIEW	⁶ 7 ⁸ ⁹
5	Speed 3	16	Ext. Gear Flash	
6	Speed 4	17	RS232 RX (ECU interface)	
7	USB D+	18	RS232 TX (ECU interface)	
8	USB D-	19	GND	
9	GND	20	CAN 1+ (ECU interface)	
10	+ VB (50 mA max)	21	CAN 1- (ECU interface)	22 pins Deutsch male
11	GND	22	9-15 V Battery input or Gear Flash power supply (no fuse)	as "A"): contacts insertion view

A.3 – EVO3 QM Pro: 22 Pins Deutsch connector

Kindly notice there are some differences from **MXL** wirings, evidenced in red.

Pin	Signal	Pin	Signal	Connector Draw
1	+ VB (50 mA max)	12	GND	
2	GND	13	+ VB for Ext. exp. modules (350 mA max)	$\begin{array}{c} 2 & 1 & 14 \\ 3 & 15 & 21 & 12 \\ \end{array}$
3	CAN 0- (Ext. exp. modules)	14	Ext. Gear Flash	$\begin{array}{rrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr$
4	CAN 0+ (Ext. exp. modules)	15	Input 1	⁶ 7 ⁸ ⁹
5	Speed 3	16	Input 2	
6	Speed 4	17	RS232 RX (ECU interface)	
7	USB D+	18	RS232 TX (ECU interface)	
8	USB D-	19	GND	
9	GND	20	CAN 1+ (ECU interface)	
10	+ VB (50 mA max)	21	CAN 1- (ECU interface) 9-15 V Battery input or	22 pins Deutsch male connector pinout (Labelled as "A"): contacts insertion
11	GND	22	Gear Flash power supply (no fuse)	view



A.4 – MXL/EVO3 QM Pro: 37 Pins Deutsch connector

Pin	Signal	Pin	Signal	Connector Draw
1	9-15 V Battery input	20	Analog input 12 (0-5V max)	
2	Analog input 1 (0-5V max)	21	V Reference (5V – 30 mA)	
3	Analog input 2 (0-5V max)	22	V Reference (5V – 30 mA)	
4	Analog GND	23	Analog input 10 (0-5V max)	$2 \frac{118}{1930}$
5	Analog GND	24	V Reference (5V – 30 mA)	$4^{20}_{3136}^{2016}_{15}$
6	V Reference (5V – 30 mA)	25	Analog input 9 (0-5V max)	$5 \frac{21}{22} \frac{27}{27} \frac{27}{25} \frac{28}{27} \frac{14}{14}$
7	V Reference (5V – 30 mA)	26	Analog input 8 (0-5V max)	$6^{23^{234}}_{23^{234}}$
8	Analog input 3 (0-5V max)	27	Analog GND	7 2425 12 8 0 10 ¹¹
9	Analog input 4 (0-5V max)	28	GND	e g m
10	Analog input 6 (0-5V max)	29	+ VB (*)	-
11	Analog GND	30	Speed 2	
12	RPM Square Wave 4-8 V	31	Analog GND	37 pins Deutsch male
13	RPM Coil – Sq. Wave >8 V	32	Analog input 5 (0-5V max)	connector pinout (Labelled
14	+ VB (50 mA max)	33	Analog input 7 (0-5V max)	as "B"): contacts insertion
15	GND (Battery input)	34	V Reference (5V – 30 mA)	view
16	+ VB (*)	35	Analog GND	
17	+ VB (50 mA max)	36	Speed 1	
18	GND	37	Start acquisition switch	
19	Analog input 11 (0-5V max)			

(*) The total power consumption sum of pin 16 and pin 29 must not exceed 50 mA (max current sink).

Analog input 1-12 Voltage = 0-5V max , V Reference = 5V 30 mA