torqbyte_

CM5-LT

Dual Water Methanol Injection

Pump Controller

User Guide

Congratulations on the purchase of your new Torqbyte CM5-LT !

Torqbyte CM5-LT is the most robust and advanced dual Water Methanol Injection pump controller on the market. In order to take full advantage of this product's capabilities, it is important to familiarize yourself with the proper installation and maintenance instructions contained in this user guide. Please take some time to review it in detail. For more information and updates on the CM5-LT and its accessories, please visit us at torqbyte.com

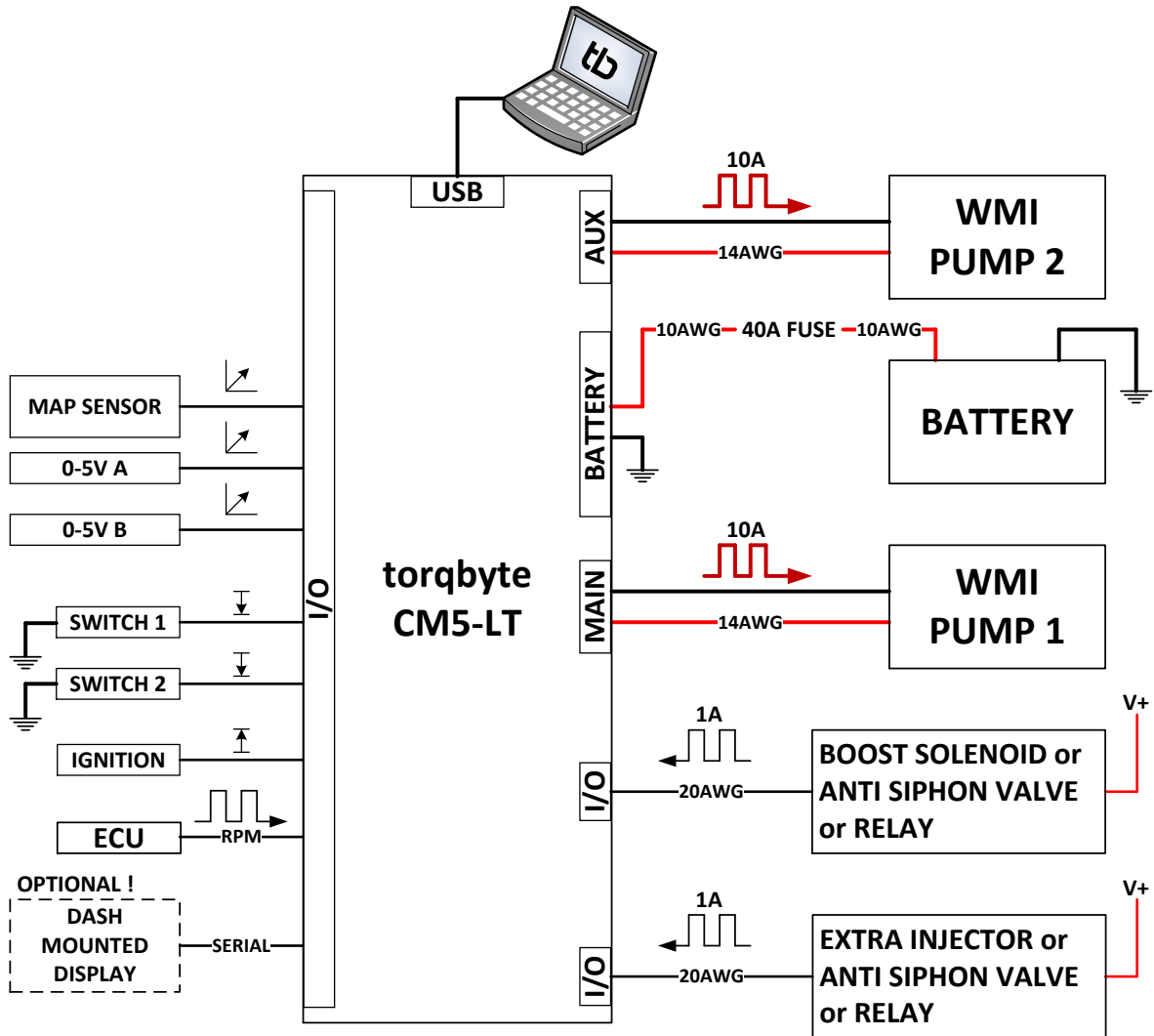# Contents

Warnings and Disclaimer

- This product is intended for racing applications and off-road use only and never for use on highways or public roads.
- This installation procedure is not for novices. Install and use this product with EXTREME caution.
- The fuel pump is an extremely dangerous point of failure due to a combination of electricity and fuel. This unit can supply the fuel pump assembly with dangerous levels of electrical energy.
- If you are not proficient in proper wiring techniques and familiar with basic electrical theory, DO NOT attempt this installation. Obtain help from a trained professional or contact us for technical assistance.
- Any misuse, improper installation, tampering, or misapplication of this product will void its warranty and could result in property damage, injury, or death.
- This product is designed for positive 12V systems with a negative chassis ground. DO NOT install this product on vehicles with other power or ground configurations.
- This product is designed to be controlled by OEM switched output pump controllers with a variable frequency drive (VFD) or pulse width modulated (PWM) outputs switching between 12V and Ground (0V). DO NOT use this unit with linear output drives or with switched drives generating output voltages other than 12V and 0V.
- By installing this unit, you agree with and accept the Warranty and Terms and Conditions on the last page of this user guide.

General Precautions

- The unit must NEVER get wet or be exposed to excessive moisture. It must be mounted on the inside of the vehicle at all times.
- The unit must not be covered (with carpeting, for example) or placed in direct contact with any sources of heat.
- The vehicle's battery must be disconnected before installing this unit.
- The current draw of the desired fuel pump to be driven by the unit must be must be known in advance and appropriately-sized wiring must be used for the entire wiring connection between the unit and the pump and between the unit and the battery. This concern is discussed in more detail later on in this manual.
- The colors of wires in and out of the unit should NEVER be reversed and all the polarity (+ve and –ve) markings on the unit must be STRICTLY adhered to. Reversing the polarity of any wires could damage or destroy the unit and could damage or destroy the vehicle's electrical system, and could also result in a fire hazard.
- The unit should be installed in such a way so that its front-mounted Light Emitting Diodes (LEDs) can be viewed and its USB connector accessed.
- Do not attempt to disassemble and/or repair the unit yourself as this will void the warranty.

System Block Diagram

The CM5-LT can be configured in many ways, depending on the user's specific set-up. A system block diagram is shown below:

Kit Contents

NOTE: It is recommended that you retain the original packaging in case you need to ship your CM5-LT or any of its contents back to Torqbyte in the future.

Item	Quantity	Part Number
CM5-LT Unit	1	345650
Wiring: • Main Pump Pigtail 8" Long • Auxiliary Pump Pigtail 8" Long • Power In Pigtail 8" Long • Input/Output Harness (with 72" Long MAP Sensor wiring) • USB Cable	1 1 1 1 1	
10AWG-12AWG Wire Splices (Yellow)	2	D-406-0002
14AWG-16AWG Wire Splices (Blue)	4	D-406-0003
20AWG-22AWG Wire Splices (Red)	2	D-406-0001

ITEMS REQUIRED BUT NOT INCLUDED

- Crimp-on Ring Terminals
- 40A Fuse in a Fuse Holder Equipped with 10AWG Wires
- Additional Lengths of 10AWG, 14AWG SXL Wire and 20AWG TXL Wire
- Additional Sealed Wire Splices
- Mounting Screws and Hardware

Unit Features and Interfaces

The front of the CM5-LT unit is shown below:
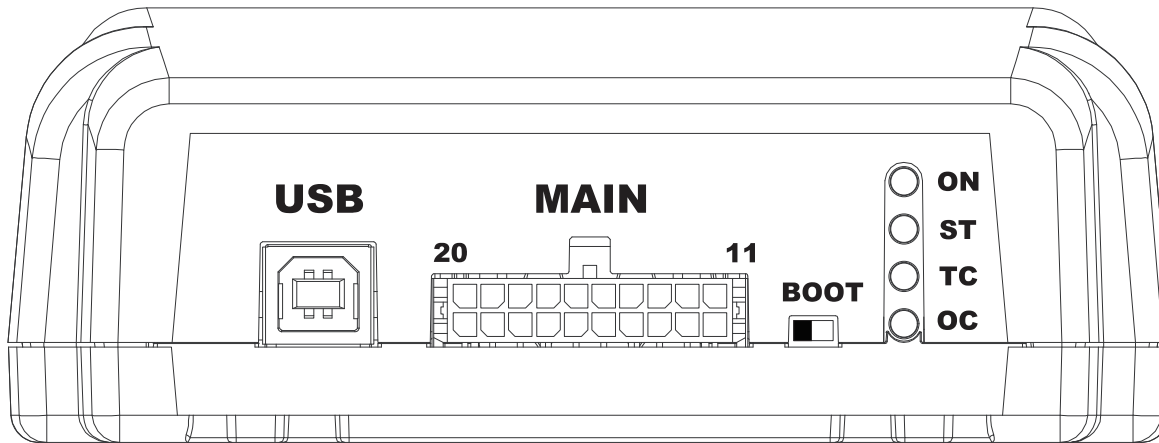
- **ON (Power)** LED steady ON indicates power and normal operation of the unit. A blinking **ON** LED indicates an internal memory corruption.
- **ST (Status)** LED steady ON indicates the unit is successfully connected via USB to a laptop or a tablet.
- **TC (Tach)** LED blinks at half the rate of the incoming RPM signal. If the engine is running and the **TC** LED is not blinking, verify your wiring.
- **OC (Overcurrent/Fault)** LED should be off by default. A blinking **OC** LED indicates a user-settable overcurrent or undercurrent safety limits have been exceeded. **OC** LED steady ON indicates a hard overcurrent (overload) fault was detected on one of the unit's two high power outputs. This type of fault causes the unit to shut down the overloaded output to protect itself.
- **BOOT** switch is used to select the unit's mode of operation. When the switch is all the way to the LEFT, the unit operates normally. When the switch is all the way to the RIGHT, the unit is in the "Firmware Update" mode in which the unit is ready to accept new firmware from the laptop or tablet connected to it via USB. Torqbyte will release new firmware versions for the CM5-LT on an ongoing basis as we roll out new functionality, improvements and updates. DO NOT slide this switch left or right when the unit is powered. This will be explained in more detail later on.
- **MAIN** connector is a 20-Pin connector that receives the unit's main harness and contains the following interfaces:
    - 12V SWITCHED IGNITION INPUT
    - 0-5V or 0-12V RPM SIGNAL INPUT
    - +5VDC POWER FOR ANALOG SENSORS
    - GROUND REFERENCE FOR ANALOG SENSORS
    - +12VDC POWER FOR THE OPTIONAL DASH-MOUNTED LCD
    - OPTIONAL DASH-MOUNTED LCD COMMUNICATION DATA LINES
    - 3 x ANALOG 0-5VDC ANALOG SENSOR INPUTS
    - 2 x GENERAL PURPOSE ACTIVE-LOW (PULL-TO-GROUND) INPUTS
    - 2 x GENERAL PURPOSE ACTIVE-LOW (PULL-TO-GROUND) OUTPUTS
- **USB** connector accepts a USB cable that is used to interface the unit to a laptop or a tablet for uploading/downloading the unit's configuration parameters, data logging and firmware updates.

The rear of the CM5-LT unit is shown below:
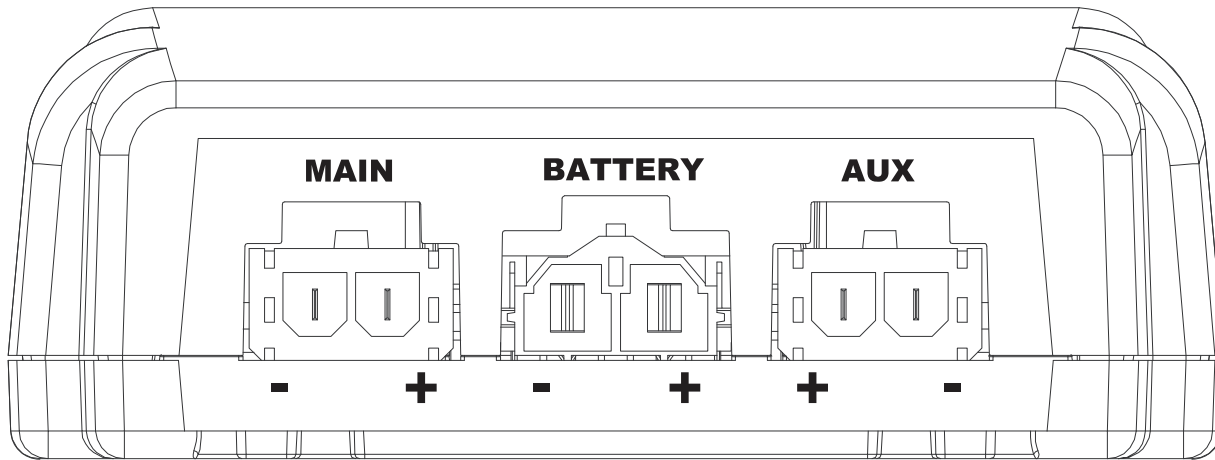
- **AUX OUTPUT** is the secondary high power pump output. This output can be used for driving a second water methanol injection pump or a fuel pump. This output can be operated in full CM5-LT control mode or can be operated in factory fuel pump modulator pass-through mode, in which the output emulates the pulses issued by the factory fuel pump modulator. The unit can also be configured to allow the factor fuel pump modulator to be in control some of the time and take over a user-defined set point. This output is capable of supplying the connected pump with 10A of current.
- **BATTERY IN** connector receives the unit's power feed from the vehicle battery.
- **MAIN OUTPUT** is the primary high power pump output. This output can be used for driving a water methanol injection pump or a secondary fuel pump. This output can only be operated in full CM5-LT control mode. This output is capable of supplying the connected pump with 10A of current.

Kit-Included Wiring

The CM5-LT kit comes with an Input/Output Harness with a 6ft MAP sensor harness, a 4ft LCD harness and three 8" long power and pump output pigtails as follows:

Auxiliary Out Pump Pigtail

Power In Pigtail

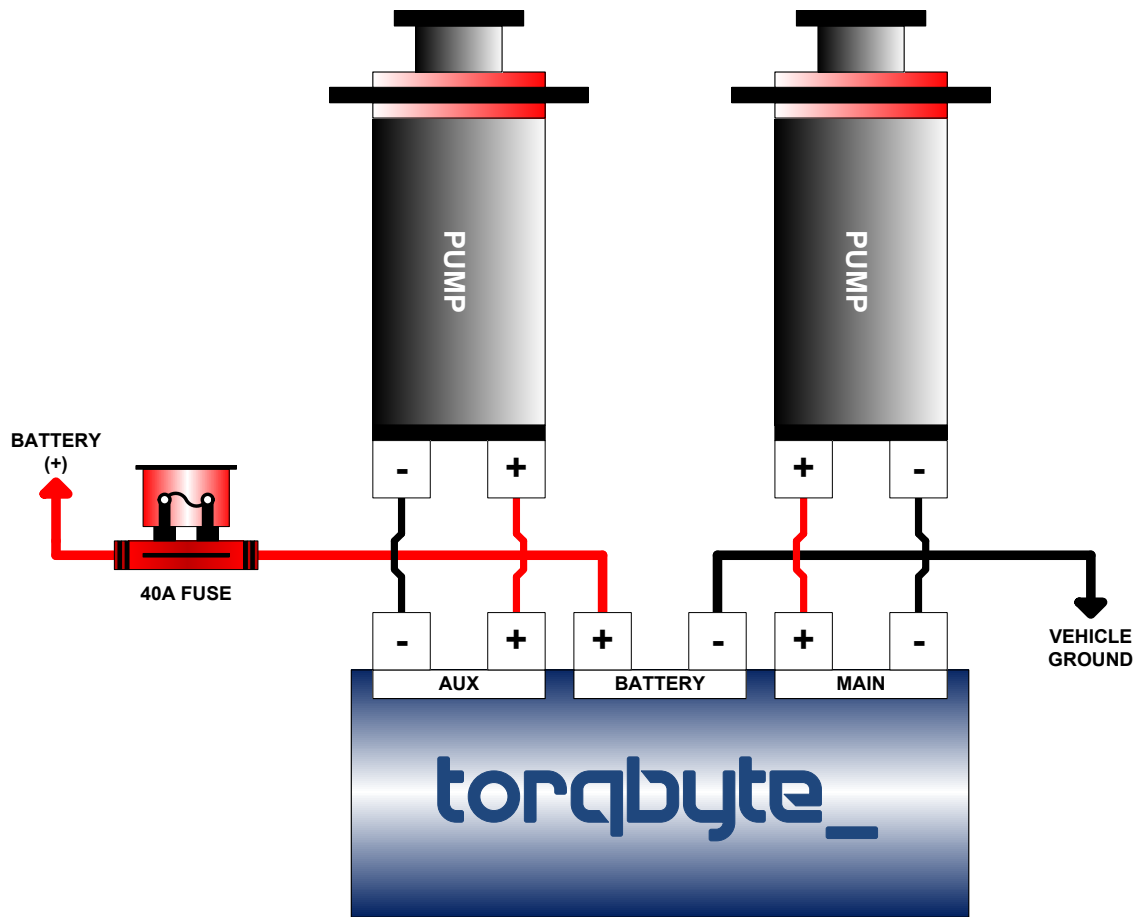# Main Pump Out Pigtail

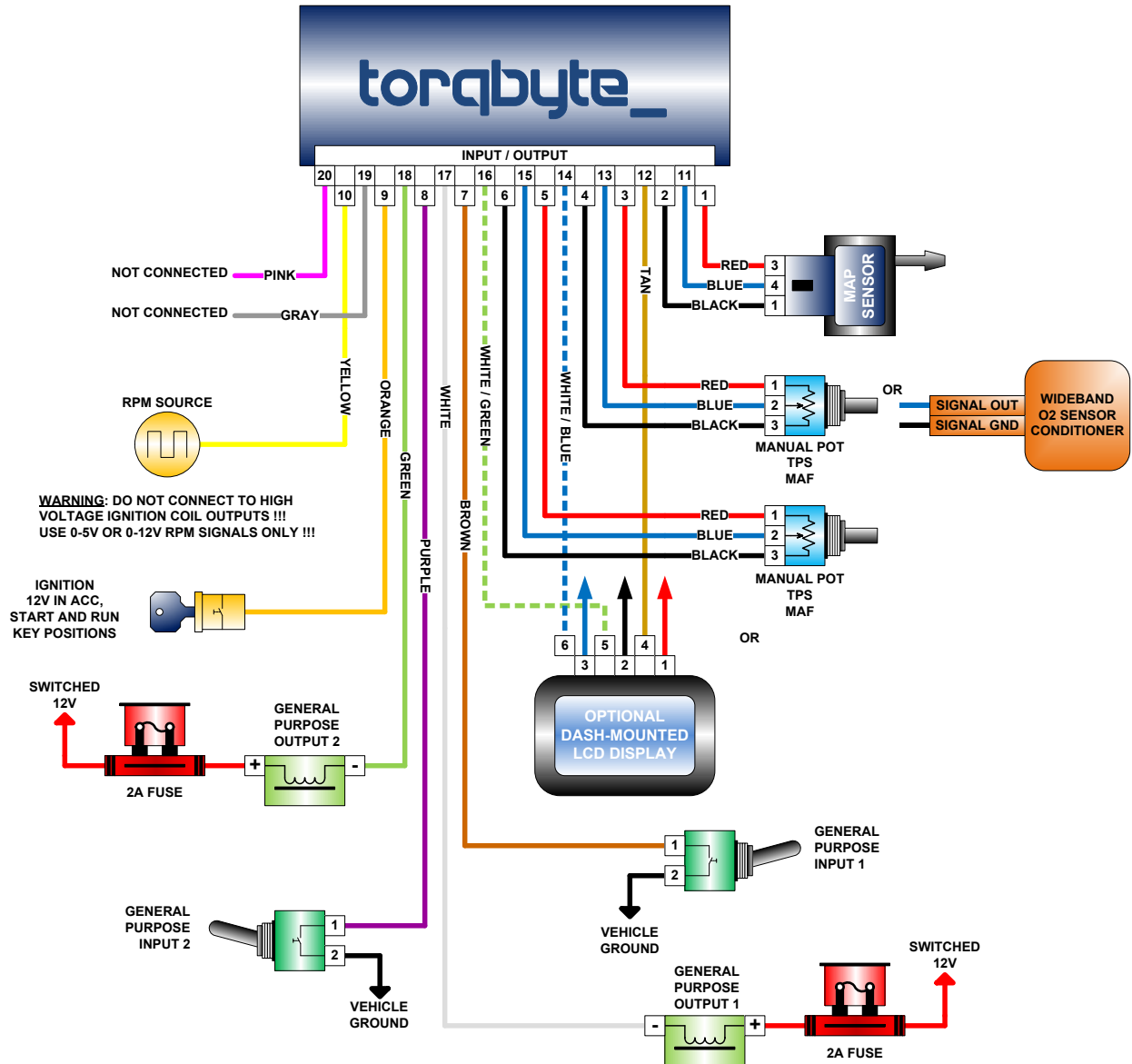## Wiring Diagram – High Power Wiring
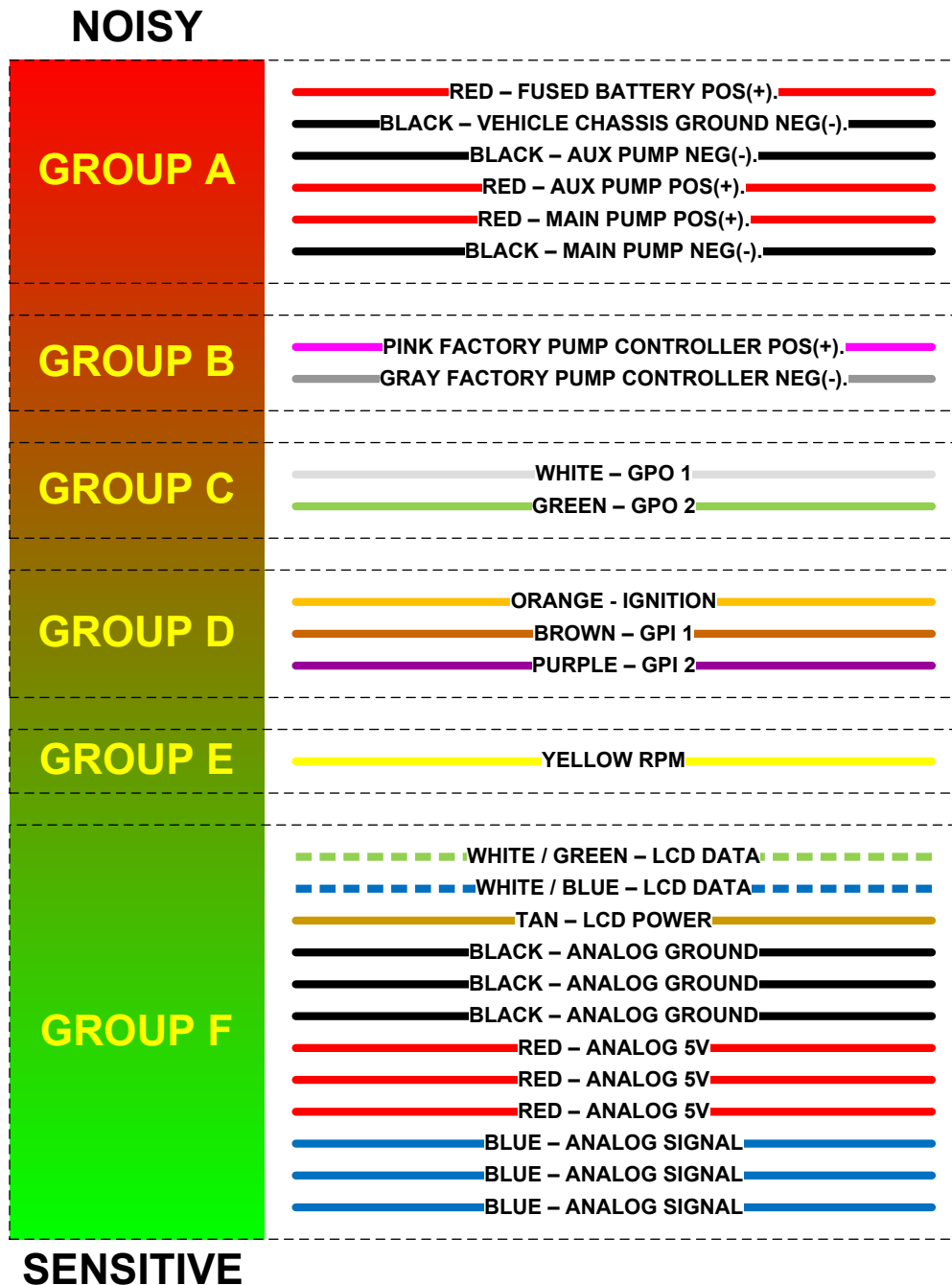
The CM5-LT high power wiring diagram is shown below:

Wiring Diagram – Input and Output Wiring

The CM5-LT input / output wiring diagram is shown below:

Wire Routing Caution

The diagram below shows how the unit wiring should be grouped. Some wires carry switching signals which are very noisy and can corrupt other sensitive signals and cause the unit to interpret false pressure readings or derive erroneous RPM values. The unit provides extensive hardware and software signal conditioning mechanisms to minimize the effects of noise-induced problems on its sensitive signal lines, but the user is cautioned to NEVER bundle together or run parallel to each other for any considerable distance, any wires from different Wire Groups shown below – especially anything from Group A together with or parallel to anything from Groups E or F.

NOISY

GROUP A
- RED – FUSED BATTERY POS(+).
- BLACK – VEHICLE CHASSIS GROUND NEG(-).
- BLACK – AUX PUMP NEG(-).
- RED – AUX PUMP POS(+).
- RED – MAIN PUMP POS(+).
- BLACK – MAIN PUMP NEG(-).

GROUP B
- PINK FACTORY PUMP CONTROLLER POS(+).
- GRAY FACTORY PUMP CONTROLLER NEG(-).

GROUP C
- WHITE – GPO 1
- GREEN – GPO 2

GROUP D
- ORANGE - IGNITION
- BROWN – GPI 1
- PURPLE – GPI 2

GROUP E
- YELLOW RPM

GROUP F
- WHITE / GREEN – LCD DATA
- WHITE / BLUE – LCD DATA
- TAN – LCD POWER
- BLACK – ANALOG GROUND
- BLACK – ANALOG GROUND
- BLACK – ANALOG GROUND
- RED – ANALOG 5V
- RED – ANALOG 5V
- RED – ANALOG 5V
- BLUE – ANALOG SIGNAL
- BLUE – ANALOG SIGNAL
- BLUE – ANALOG SIGNAL

SENSITIVE

General Wiring Information

The supplied wiring uses the automotive-grade SXL and TXL wire. This wire has the temperature rating and abrasion/chemical resistance characteristics that make it suitable for this application. It is strongly recommended that the installation be completed with equivalent or better-than wire type.

Wire splices are required to complete this installation. The included wire splices are automotive grade and provide sealing when properly heatshrunk. It is strongly recommended to crimp these splices with a manufacturer-recommended crimping tool. TE Connectivity crimper AD-1522, shown below, is available from the manufacturer's distributors *mouser.com* and *digikey.com* along with other online distributors.

NOTE: If you prefer to avoid doing any wiring, we can supply you with a custom-made set of wire harnesses suited to your application. We require only a basic hand-drawn sketch with some lengths and terminal sizes. Please contact us for pricing and lead-time information.
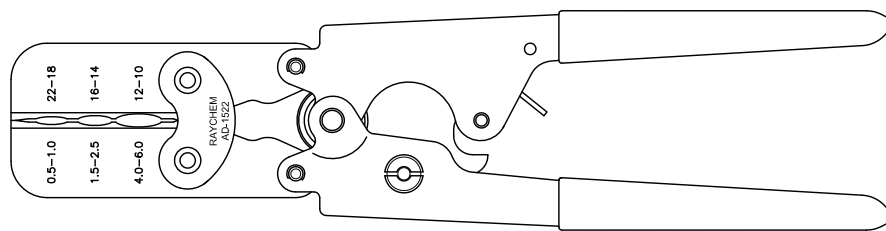
Wire Splices

If additional splices are required, it is recommended to use the TE Connectivity Duraseal splices shown in the table below:

Part No.	Wire Gauge	Color	Wire Strip Length	Recommended Crimper	Supplier	Supplier
D-406-0003	12-10 AWG	Yellow	3/8" - 1/2"	AD-1522	Mouser	Digikey
D-406-0002	16-14 AWG	Blue	1/4" - 3/8"	AD-1522	Mouser	Digikey
D-406-0001	22-18 AWG	Red	1/4" - 3/8"	AD-1522	Mouser	Digikey

Alternately, the following GM splices can also be used and can be crimped using the same AD-1522 crimping tool shown in Figure 3:

Part No.	Color	Wire Gauge	Supplier	Recommended Crimper
19168448	Yellow	12-10 AWG	General Motors	TE AD-1522 or GM J-38125-8 (12085115)
19168447	Blue	16-14 AWG	General Motors	TE AD-1522 or GM J-38125-8 (12085115)
19168446	Red	22-18 AWG	General Motors	TE AD-1522 or GM J-38125-8 (12085115)

Ring Terminals

This installation requires the use of ring terminals. However, they are not included in the supplied kit due to a variety of bolt sizes specific to each user's application. The table below shows some ring terminals from TE Connectivity's Duraseal product family.

Part No.	Wire Gauge	Screw Size	Wire Strip Length	Recommended Crimper	Supplier	Supplier
B-106-1503	12-10 AWG	#10	1/4"	AD-1522	Mouser	Digikey
B-106-1803	12-10 AWG	5/16"	1/4"	AD-1522	Mouser	Digikey
B-106-1993	12-10 AWG	3/8"	1/4"	AD-1522	Mouser	Digikey

Fuse Information

The connection between the CM5-LT and the battery's positive (+) terminal should include an in-line 40A automotive fuse in a sealed fuse holder with 10AWG wires. The fuse and the fuse holder are not included in the CM5-LT kit, but the two Littelfuse part numbers below are recommended:

Fuseholder Part No.	FHJC1001G
Description	Automotive Fuse Holder 58VDC
Manufacturer	Littelfuse
Supplier	Mouser / DigiKey

Fuse Part No.	JCAS040.X
Description	Automotive Fuse 40A 32VDC
Manufacturer	Littelfuse
Supplier	Mouser / DigiKey

Connector Information

Although the required mating connectors are all provided with the supplied pigtails, should the user want to replace those included with their own custom wiring, information about the unit's mating connectors is provided below:

Connectors	POWER IN
Maximum Current Capacity	36A
Wire Gauge	10 AWG
Wire Type	SXL-10
Mating Connector	Molex Mini-Fit Sr. **42816-0212**
Connector Contacts	Molex Mini-Fit Sr. **42815-0011**
Manual Crimper	Molex **63811-1600**
Contact Durability	30 Mate and Unmate cycles

Connector	MAIN / AUXILIARY OUT
Maximum Current Capacity	20A
Wire Gauge	14 AWG
Wire Type	SXL-14
Mating Connector	Molex Sabre **44441-2002**
Connector Contacts	Molex Sabre **43375-1001**
Manual Crimper	Molex **63811-7300**
Contact Durability	25 Mate and Unmate cycles

Connector	INPUT/OUTPUT
Maximum Current Capacity	3A
Wire Gauge	20 AWG
Wire Type	TXL-20
Mating Connector	Molex Micro-Fit-3 **43025-2000**
Connector Contacts	Molex Micro-Fit-3 **43030-0002**
Manual Crimper	Molex **63819-0000**
Contact Durability	**30** Mate and Unmate cycles

Connector	MAP SENSOR
Maximum Current Capacity	3A
Wire Gauge	20 AWG
Wire Type	TXL-20
Mating Connector	Bosch Kompakt 1.1m **1 928 403 736**
Connector Contacts	Bosch Damping Kontakt (BDK 2.8) **1 928 498 056**
Wire Seals (Positions 1,3,4)	Bosch **1 928 300 599** / TE Connectivity **828904-1**
Sealing Plugs (Position 2)	Bosch **1 928 300 601** / TE Connectivity **828922-1**
Manual Crimper	Bosch **1 928 498 161**
Contact Durability	**30** Mate and Unmate cycles

Installation Procedure

Ensure both battery terminals are disconnected from the battery before starting the installation.

Main Water Methanol Injection Pump Wiring

1. Strip 1/4" off each wire end and insert into the supplied blue wire splice as shown below:
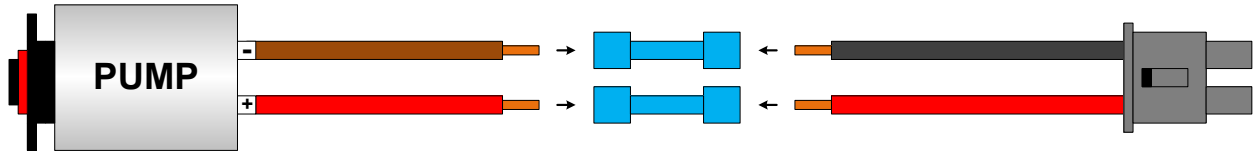
2. Crimp each splice at each end and gently tug on the wires to make sure they are crimped securely. Using a heat gun, heatshrink both splices until the liquid adhesive melts and completely seals the wires.

   NOTE: Concentrate the heat on the splice and not the wire. Excessive heating of the wire insulation can cause it to melt or become degraded, causing it to fail in the future.
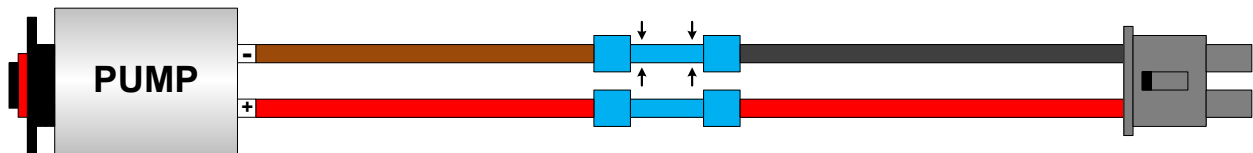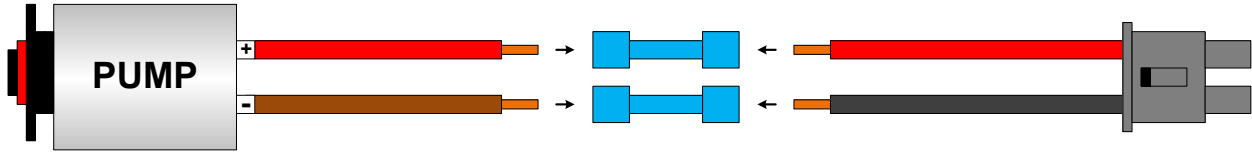

3. Plug the harness into CM5-LT's   MAIN   connector.
   NOTE: Main Pump and Auxiliary Pump connectors are of OPPOSITE polarity. DO NOT plug the Main Pump Harness into the Auxiliary Out connector or vice versa. Doing so will drive the pump in the wrong direction and could damage the pump and or the unit.

Auxiliary Water Methanol Injection Pump Wiring

1. Strip 1/4" off each wire end and insert into the supplied blue wire splice as shown.

2. Crimp each splice at each end and gently tug on the wires to make sure they are crimped securely. Using a heat gun, heatshrink both splices until the liquid adhesive melts and completely seals the wires.

   NOTE: Concentrate the heat on the splice and not the wire. Excessive heating of the wire insulation can cause it to melt or become degraded, causing it to fail in the future.
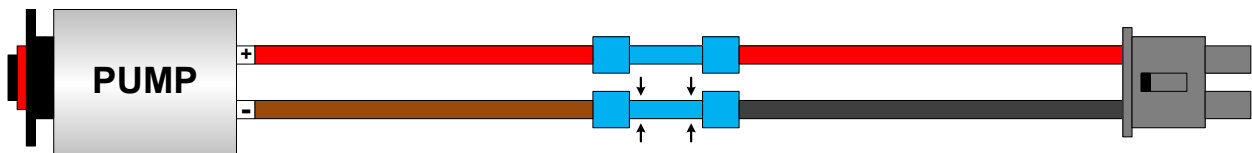

3. Plug the harness into the CM5-LT's AUX connector.
   NOTE: Main Pump and Auxiliary Pump connectors are of OPPOSITE polarity. DO NOT plug the Main Pump Harness into the Auxiliary Out connector or vice versa. Doing so will drive the pump in the wrong direction and could damage the pump and or the unit.
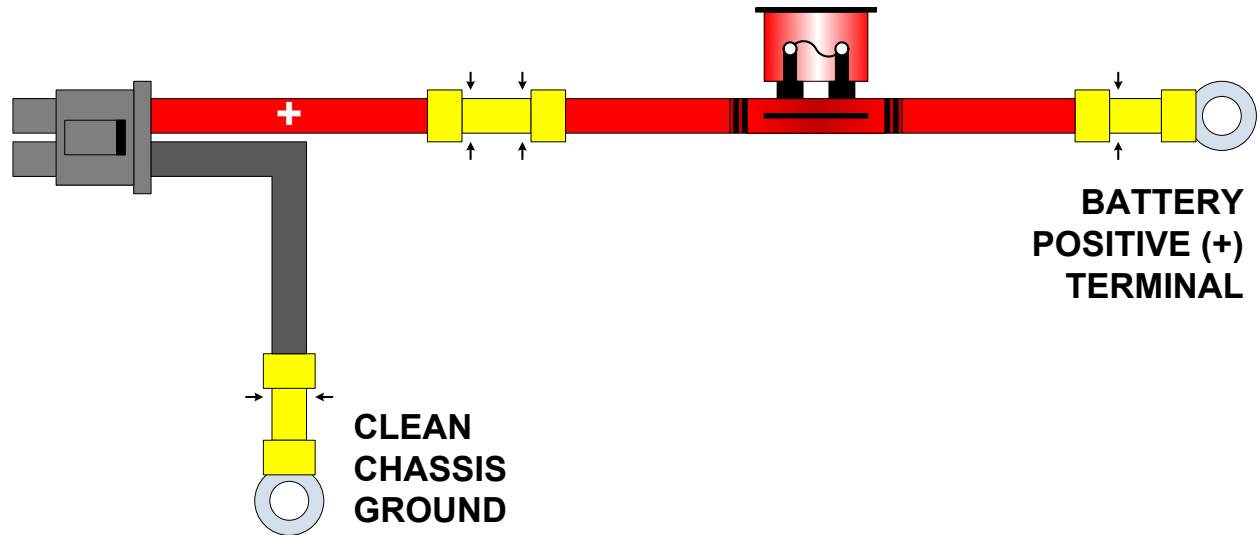
Unit Power Wiring

Power connection to the CM5-LT should include a permanent attachment to the positive (+) battery terminal and a connection to the negative (–) ground connection somewhere on the chassis. The positive (+) connection should be as short as possible and should not be made to a switched circuit. The negative (–) connection should be made to an electrically conductive surface that is free of paint, rust, oil, and grease. Both connections should be made using ring terminals.

1. Strip 3/8" - 1/2" from the wire ends.

40A FUSE
(Not Included)
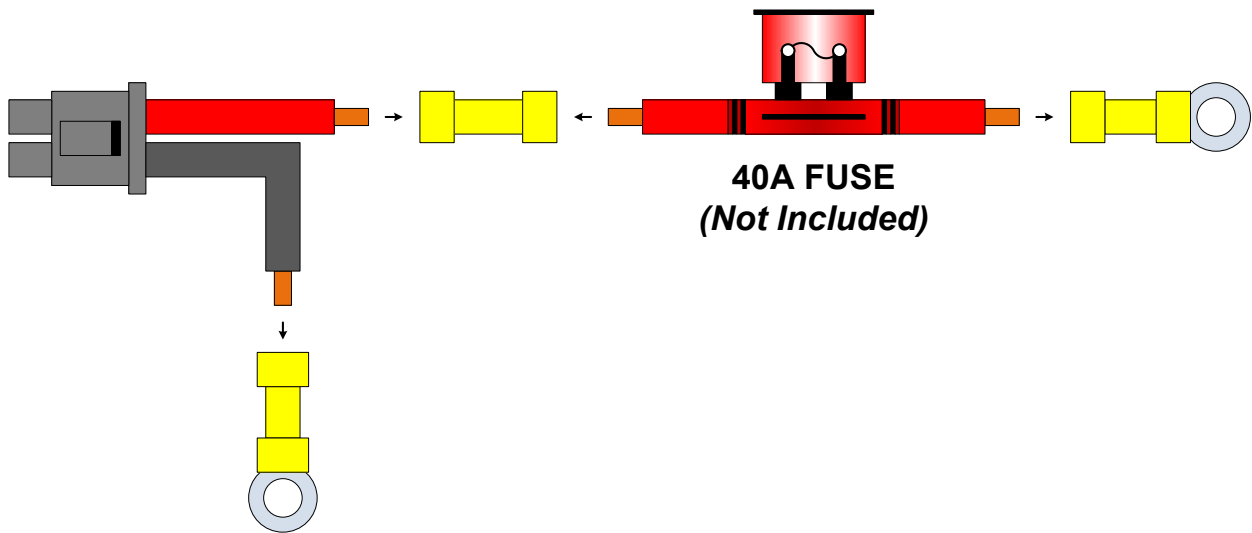
2. Crimp each splice at each end and at the ring terminals and gently tug on the wires to make sure they are crimped securely.
3. Using a heat gun heatshrink both splices until the liquid adhesive melts and completely seals the wires.
   NOTE: Concentrate the heat on the splice and not the wire. Excessive heating of the wire insulation can cause it to melt or become degraded causing it to fail in the future.

BATTERY POSITIVE (+) TERMINAL

CLEAN CHASSIS GROUND

4. Plug the harness into the CM5-LT's [**BATTERY**] connector.

NOTE: Reversing the polarity of the input power wires and connecting the harness to the battery WILL DESTROY the unit.

Input/Output Wiring

The Input/Output Connector on the supplied wiring has the following pinout as viewed facing the unit after with connector is plugged into the unit:
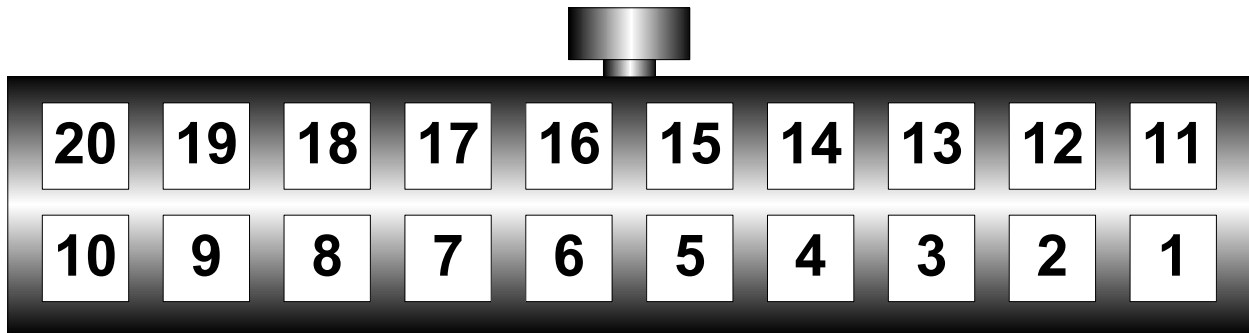

| Pin No.	Signal Name	Wire Color	Signal Description
1	+5V	RED	Analog Sensor Power
2	GND	BLACK	Analog Sensor Ground
3	+5V	RED	Analog Sensor Power
4	GND	BLACK	Analog Sensor Ground
5	+5V	RED	Analog Sensor Power
6	GND	BLACK	Analog Sensor Ground
7	GPI 1	BROWN	General Purpose Input 1 (pull to GND to activate)
8	GPI 2	PURPLE	General Purpose Input 2 (pull to GND to activate)
9	IGN	ORANGE	+12V Key Switched Ignition Voltage
10	RPM	YELLOW	0-12V or 0-5V Square Wave RPM Reference
11	ANALOG MAP	BLUE	0-5V MAP Sensor Analog Signal
12	LCD POWER	TAN	+12V Filtered Power to the Optional LCD
13	ANALOG A	BLUE	0-5V Spare Analog Signal (typically for Wideband O2)
14	LCD DATA A	WHITE/BLUE	Serial Data to the Optional LCD
15	ANALOG B	BLUE	0-5V Spare Analog Signal (typically for Boost Control)
16	LCD DATA B	WHITE/GREEN	Serial Data to the Optional LCD
17	GPO 1	WHITE	General Purpose Output 1 (pull to GND, 1.5A MAX)
18	GPO 2	GREEN	General Purpose Output 2 (pull to GND, 1.5A MAX)
19	FP DRIVE NEG	GRAY	Not Connected
20	FP DRIVE POS	PINK	Not Connected

NOTE: As a minimum, signal wires at Pins 1,2,9,10,11 highlighted above MUST be connected for the unit to be able to perform its most basic function.

Ignition Input - Required

Depending on the user's desired configuration, this wire should be connected to the car's ignition switch such that it will see 12V when the key is turned to ACCESSORY, START or RUN positions. This is important if it is desirable to have the unit turn on when the key is in the ACCESSORY position without the engine running. However, this may not be desirable if the unit is configured such that it could activate the water methanol pump or another output without the engine running, thus risking hydrolocking the engine. However, if the unit is configured to control the fuel pump and required to prime the fuel system before the engine is started, the user may want to wire this signal in a way that enables fuel pump activation at the same key position as the car's factory system.
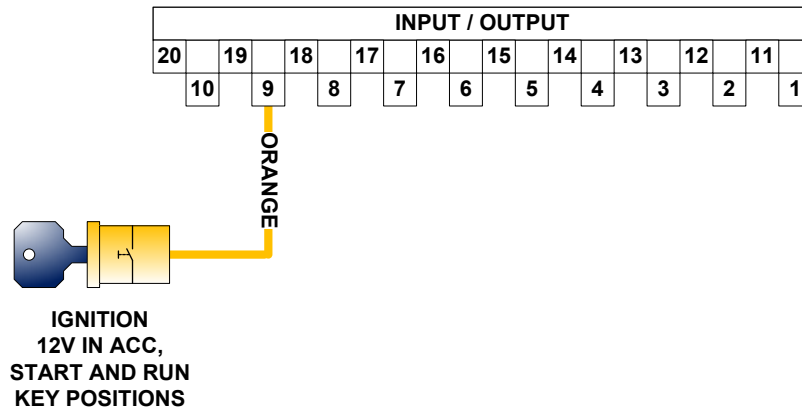

The unit uses this signal to activate a small internal relay which has a 200 Ohm relay coil to ground. This means that the circuit used for this signal will need to be able to supply about 75mA of current. Shown below is a schematic diagram of the relevant circuitry in the unit:
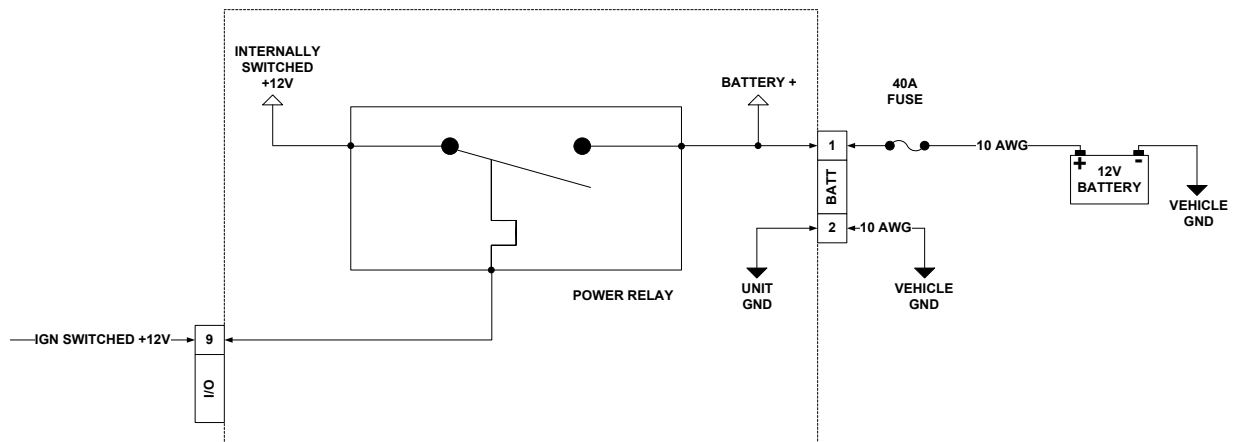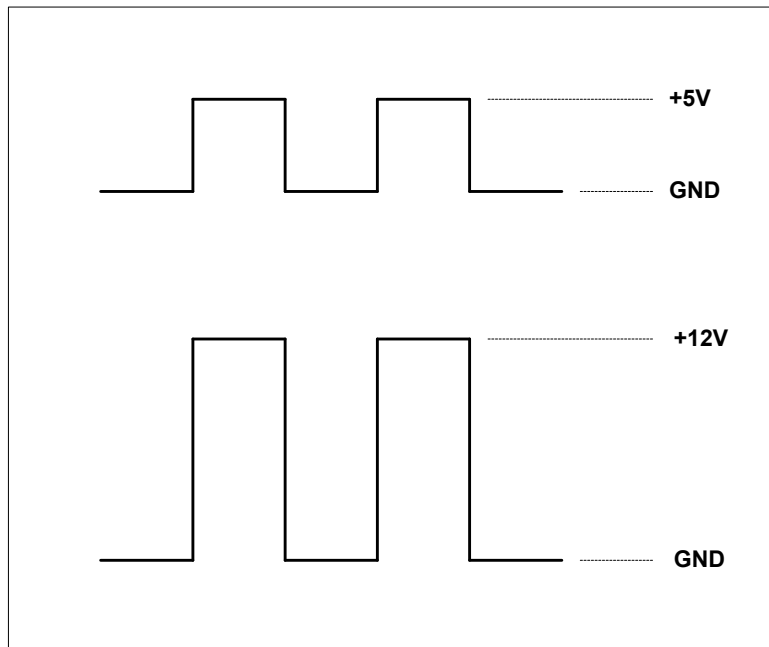
RPM Input - Required

Depending on the user's desired set-up configuration, this signal can be sourced from a number of places in the vehicle such as the ECU, an injector output (which may be a problematic in some vehicles such as late model Porsches that stop pulsing their injectors at some point in their RPM band) or the dedicated RPM output of an aftermarket Engine Management System (EMS) or an aftermarket ignition control.

INPUT / OUTPUT

20		19		18		17		16		15		14		13		12		11	
	10		9		8		7		6		5		4		3		2		1

YELLOW

RPM SOURCE
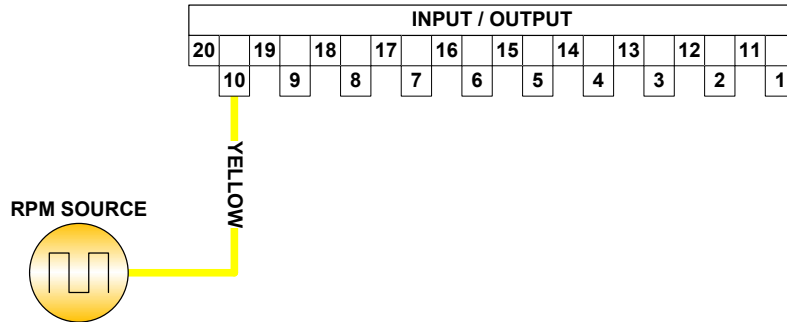
WARNING: DO NOT CONNECT TO HIGH VOLTAGE IGNITION COIL OUTPUTS !!!
**USE 0-5V OR 0-12V RPM SIGNALS ONLY !!!**

NOTE: Wherever the RPM signal is derived from, it is EXTREMELY IMPORTANT for the user to ensure it generates a **0V to 5V or 0V to 12V square wave signal**. NEVER connect this wire to high voltage outputs of magnetos or inductive coil drivers. Such configurations will expose this input to extremely high voltages which will damage or destroy the unit.


ALLOWABLE RPM INPUT LEVELS

+5V

GND

+12V

GND

MAP Sensor Input – Required

The unit is supplied with a 4-BAR MAP sensor. The required connection is shown below.
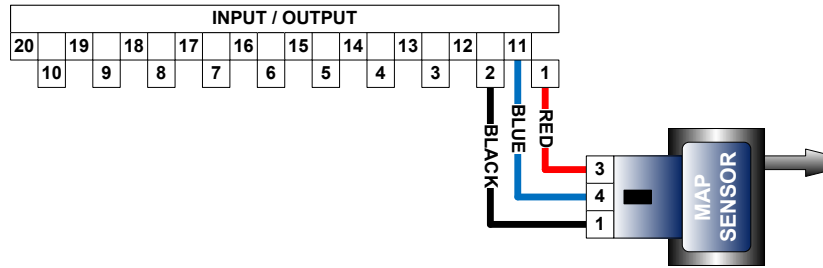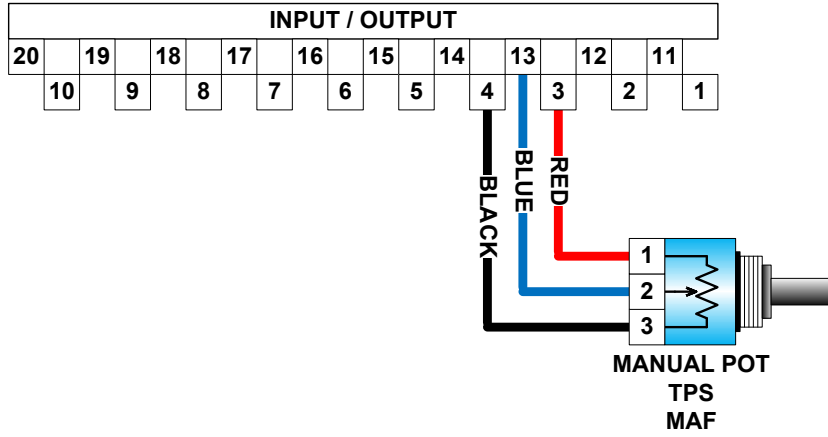

Other MAP sensors can be used, but their output curves will need to be entered in the TorqTune software so the unit software can make the necessary correction for that MAP sensor. The pinout for the supplied sensor is shown below.
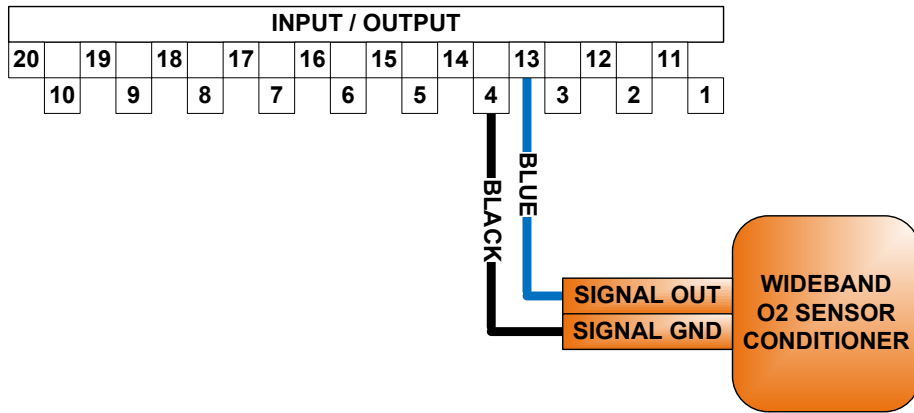

4: Output
3: +5Vdc
2: Not Used
1: Ground
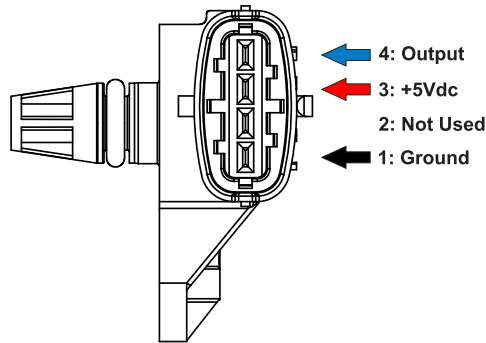
Spare 0-5V Analog Input A - Optional

The CM5-LT provides an uncommitted spare analog input that can be used to measure an external voltage ranging from 0V to 4.7V. This voltage can be selected as the source of the values for the vertical axis in any of the unit's 16x16 duty tables. This allows the user to implement their own unique pump control schemes that have the ability to vary the duty of any of the outputs based on RPM + this voltage instead of RPM + Boost Pressure (i.e. MAP Sensor Voltage). This voltage may be derived from a number of 0-5V sensors such as Mass Airflow (MAF), Throttle Position Sensor (TPS) or a 0-5V output from an O2 Wideband Controller/Conditioner. It can also be derived from a manually operated multi-turn potentiometer that the user can mount on and operate from their dashboard or somewhere else in the vehicle.

Some typical configurations are shown below.

INPUT / OUTPUT

20		19		18		17		16		15		14		13		12		11	
	10		9		8		7		6		5		4		3		2		1

BLACK
BLUE
RED

1
2
3

**MANUAL POT
TPS
MAF**

OR

INPUT / OUTPUT

20		19		18		17		16		15		14		13		12		11	
	10		9		8		7		6		5		4		3		2		1

BLACK
BLUE

SIGNAL OUT
**SIGNAL GND**

**WIDEBAND
O2 SENSOR
CONDITIONER**

Spare 0-5V Analog Input B - Optional

CM5-LT provides a second uncommitted spare analog input that can be used to measure an external voltage ranging from 0V to 4.7V. This voltage can be selected as the source of the values for the vertical axis in any of the unit's 16x16 duty tables. This allows the user to implement their own unique pump control schemes that have the ability to vary the duty of any of the outputs based on RPM + this voltage instead of RPM + Boost Pressure (i.e. MAP Sensor Voltage). This voltage may be derived from a number of 0-5V sensors such as Mass Airflow (MAF), Throttle Position Sensor (TPS). This input is most commonly used as a Boost Reference input that allows the user to operate a multi-turn potentiometer to adjust the boost set point the unit attempts to hold when its General Purpose Output 1 (GPO 1) is used to perform electronic boost control via the internal software Proportional Integral Derivative (PID) algorithm.

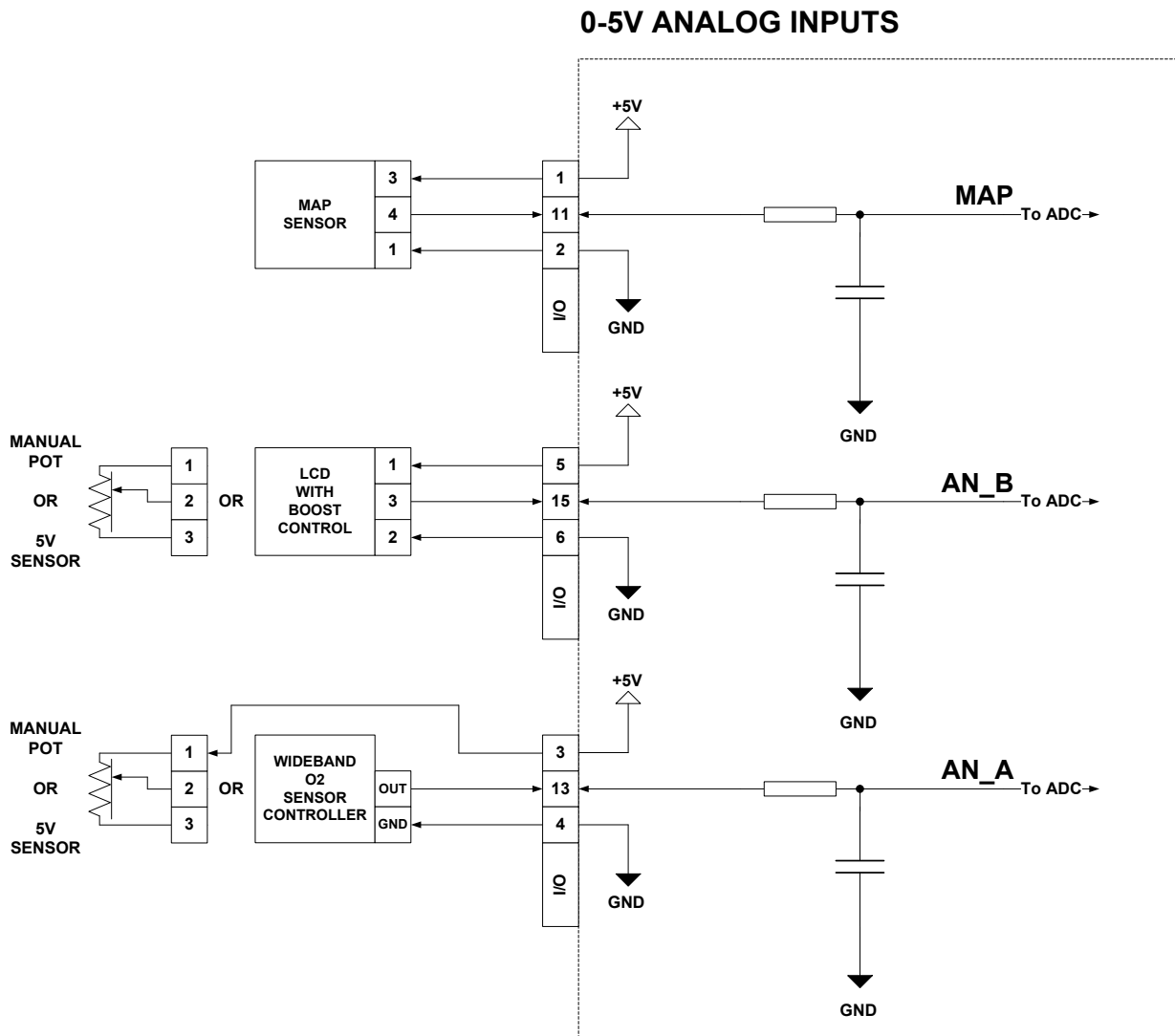A typical configuration is shown below.

MANUAL POT
TPS
MAF
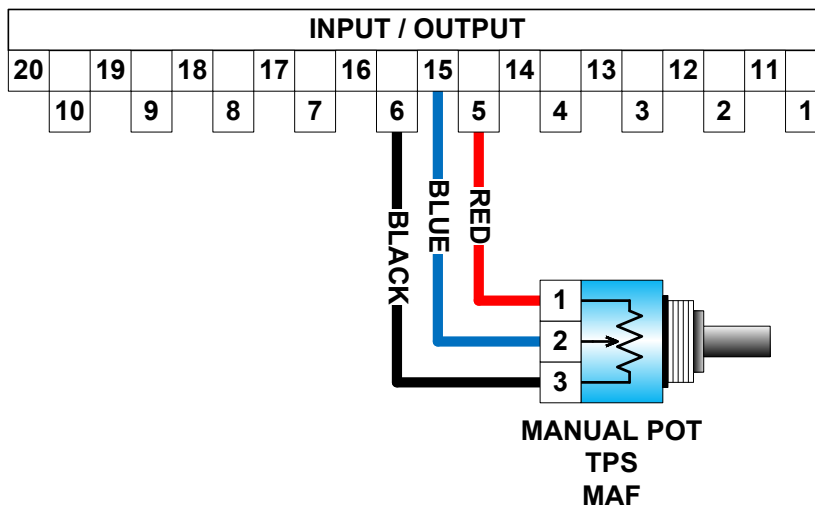
An optional dashboard-mounted LCD screen is also available with includes a digital potentiometer which allows the user to raise and lower the boost setting right from the LCD by clicking the up and down buttons. This configuration is shown below.
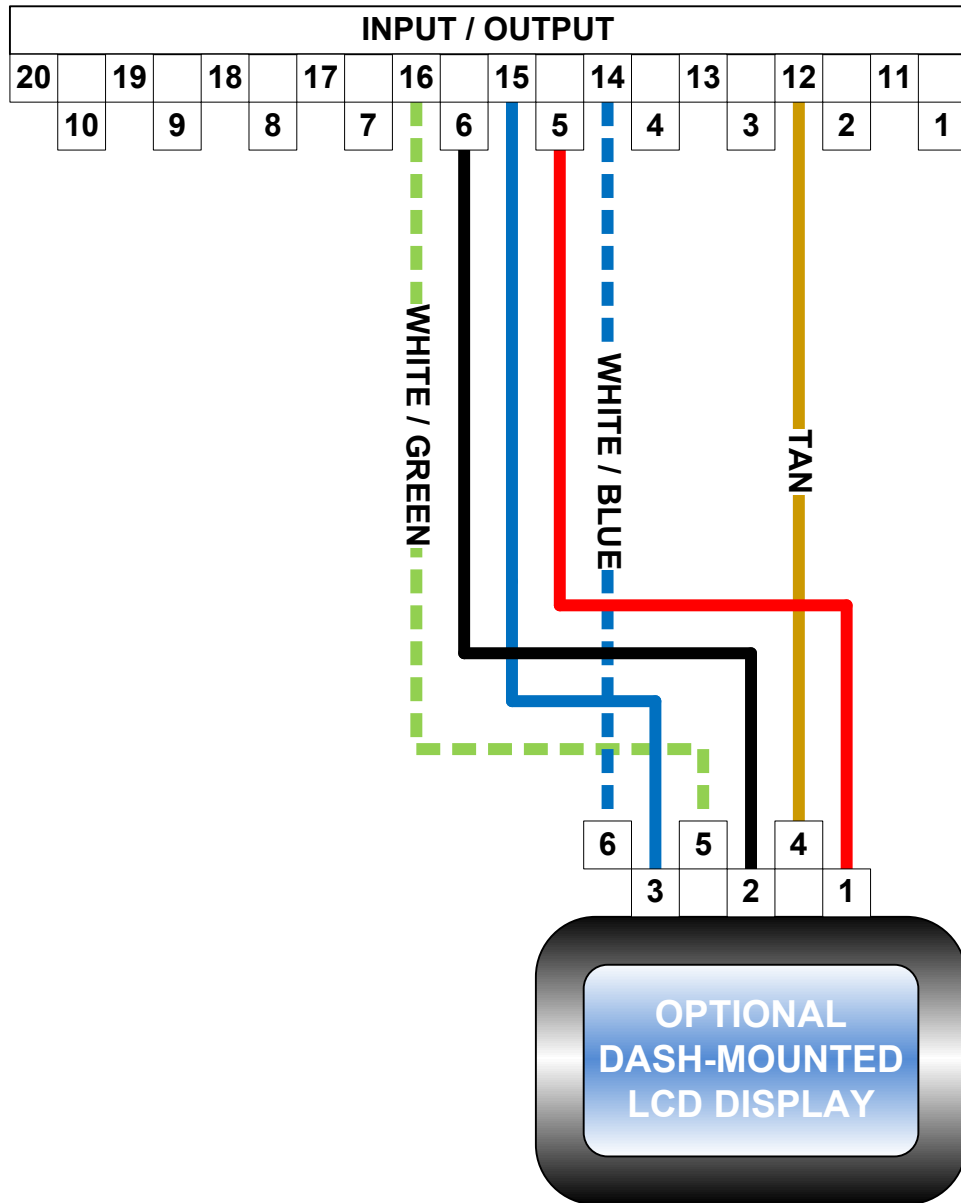
Analog Inputs – Schematic

Shown below is a schematic diagram of the relevant circuitry in the unit:

0-5V ANALOG INPUTS

MAP SENSOR		MAP To ADC
MANUAL POT OR 5V SENSOR	LCD WITH BOOST CONTROL	AN_B To ADC
MANUAL POT OR 5V SENSOR	WIDEBAND O2 SENSOR CONTROLLER	AN_A To ADC

General Purpose Output 1 – Optional

The CM5-LT provides the user with a low-power, pull to ground output which can "sink" 1.5A of current from an external load. Typical uses for this output include:
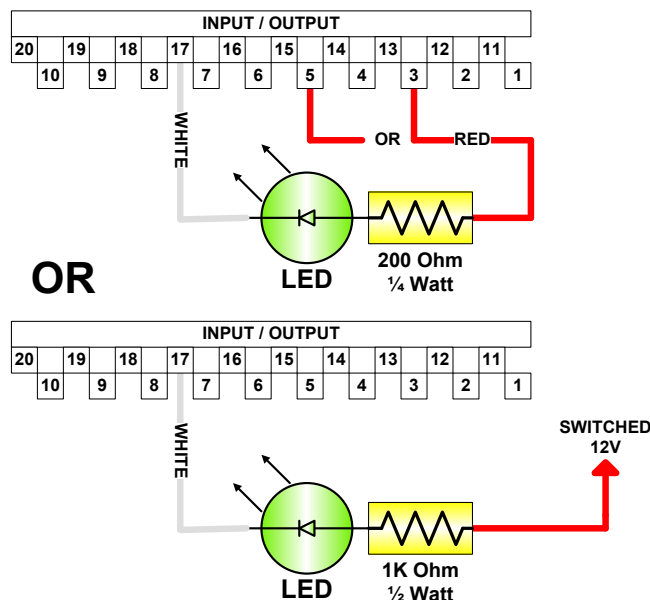
- Inline Water Methanol Anti-Siphon Solenoid
- Boost control solenoid such as the Bosch N75
- High Impedance Injector
- On-Off Relay
- 12V Indicator Light
- Indicator Light Emitting Diode (LED)

This output is fully configurable through its own dedicated 16x16 table. For loads that require to be either ON or OFF (such as a relay), the user can fill the table with 0% duty wherever the output should be OFF and 100% wherever it should be ON. When other duty values are entered, the unit will output a variable duty signal with a fixed frequency of 30Hz. This low frequency is required for fine control of solenoids. When PID boost control is used, the GPO1 table will only be used for looking up a start boost solenoid duty.

A typical configuration is shown below for driving Solenoids, Relay Coils, Injectors or Lights:
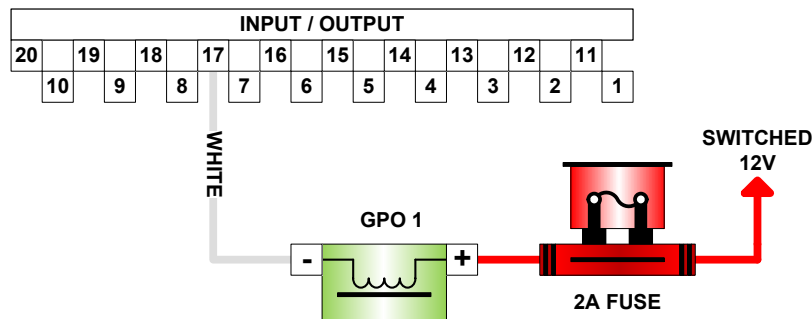
If using the output to drive an LED indicator, one of the following configurations can be used:

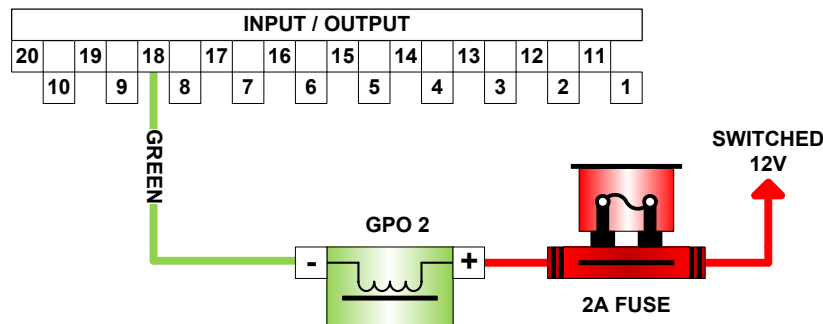## General Purpose Output 2 – Optional

The CM5-LT provides the user with a second low-power, pull to ground output which can "sink" 1.5A of current from an external load. Typical uses for this output include:

- Inline Water Methanol Anti-Siphon Solenoid
- High Impedance Injector
- On-Off Relay
- 12V Indicator Light
- Indicator Light Emitting Diode (LED)

This output is fully configurable through its own dedicated 16x16 table. For loads that require to be either ON or OFF (such as a relay) the user can fill the table with 0% duty wherever the output should be OFF and 100% wherever it should be ON. When other duty values are entered the unit will output a variable duty signal with a fixed frequency of 30Hz. This low frequency is required for fine control of solenoids.

NOTE: PID boost control is NOT available through GPO 2.

A typical configuration is shown below for driving Solenoids, Relay Coils, Injectors or Lights:
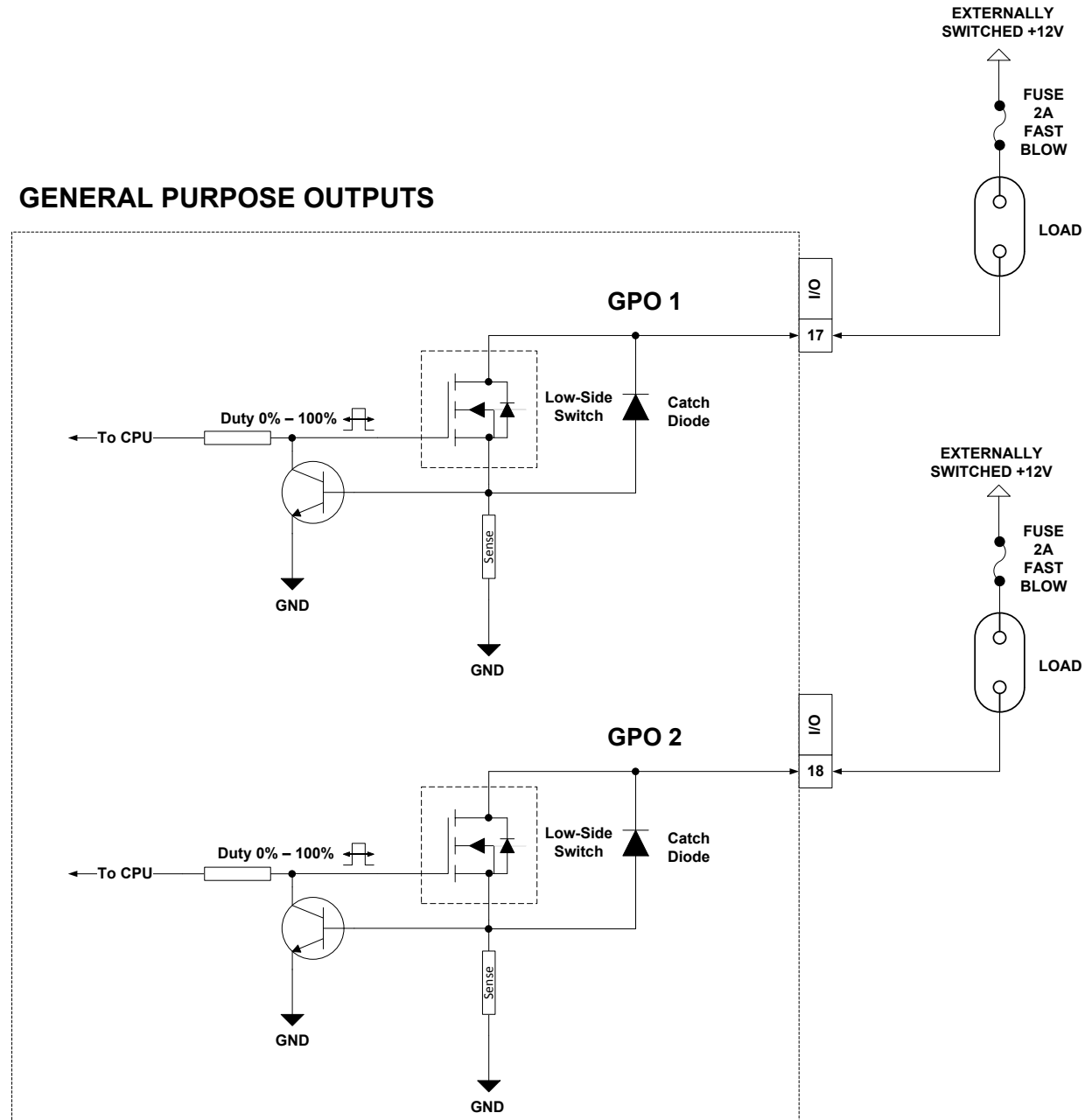

If using the output to drive an LED indicator, one of the following configurations can be used:
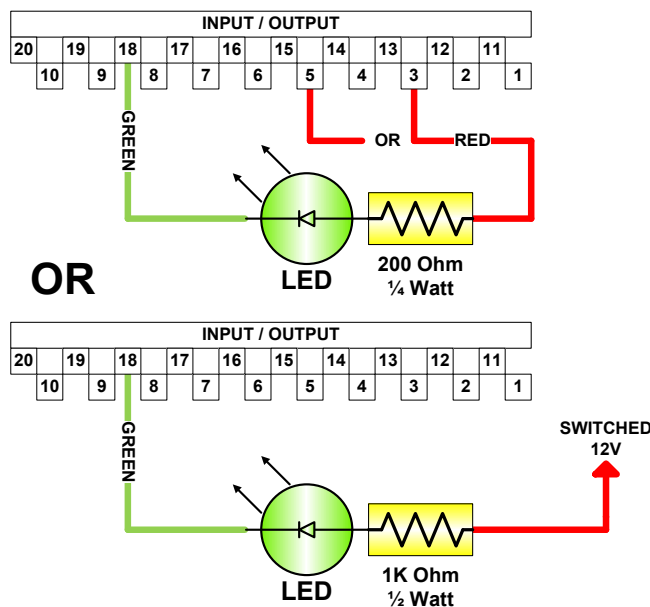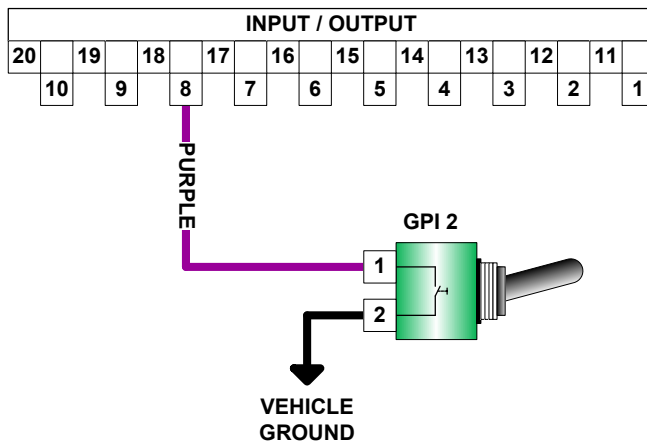
General Purpose Output Schematic

Shown below is a schematic diagram of the relevant circuitry in the unit:

GENERAL PURPOSE OUTPUTS

EXTERNALLY
SWITCHED +12V

FUSE
2A
FAST
BLOW

LOAD

GPO 1

I/O

17

Duty 0% – 100%

To CPU

Low-Side
Switch

Catch
Diode

Sense

GND

GND

EXTERNALLY
SWITCHED +12V

FUSE
2A
FAST
BLOW

LOAD

GPO 2

I/O

18

Duty 0% – 100%

To CPU

Low-Side
Switch

Catch
Diode

Sense

GND

GND

General Purpose Inputs

The CM5-LT provides the user with two general purpose logic inputs which can be connected to a manually operated toggle or momentary pushbutton switch to trigger the unit's software to execute some user-programmed behaviour. For example the unit can be configured to override an output to 100% duty when the input is active, or to cut the boost solenoid duty to 0% in order to set the boost limit to the lowest possible setting (i.e. that of the waste gate spring).

The typical configurations are shown below.
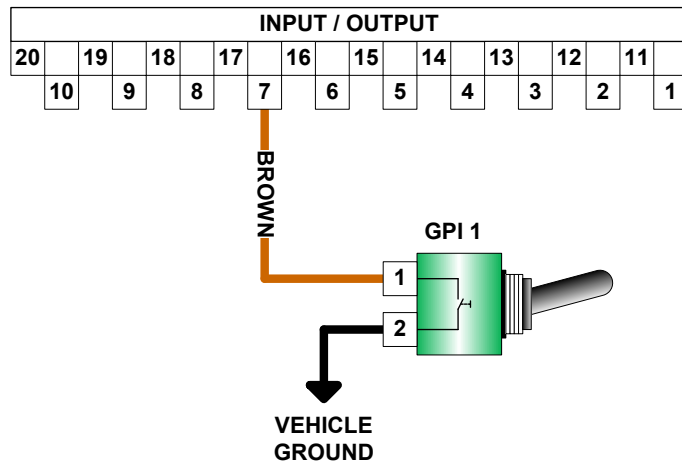
NOTE: These inputs are "active-low" which means that when they are left unconnected (or floating) the unit reads them as INACTIVE. When the user connects an input to vehicle ground the unit will read that particular input as ACTIVE. Always configure the wiring to either float or ground these inputs. NEVER connect them to a power source, such as the vehicle battery voltage.

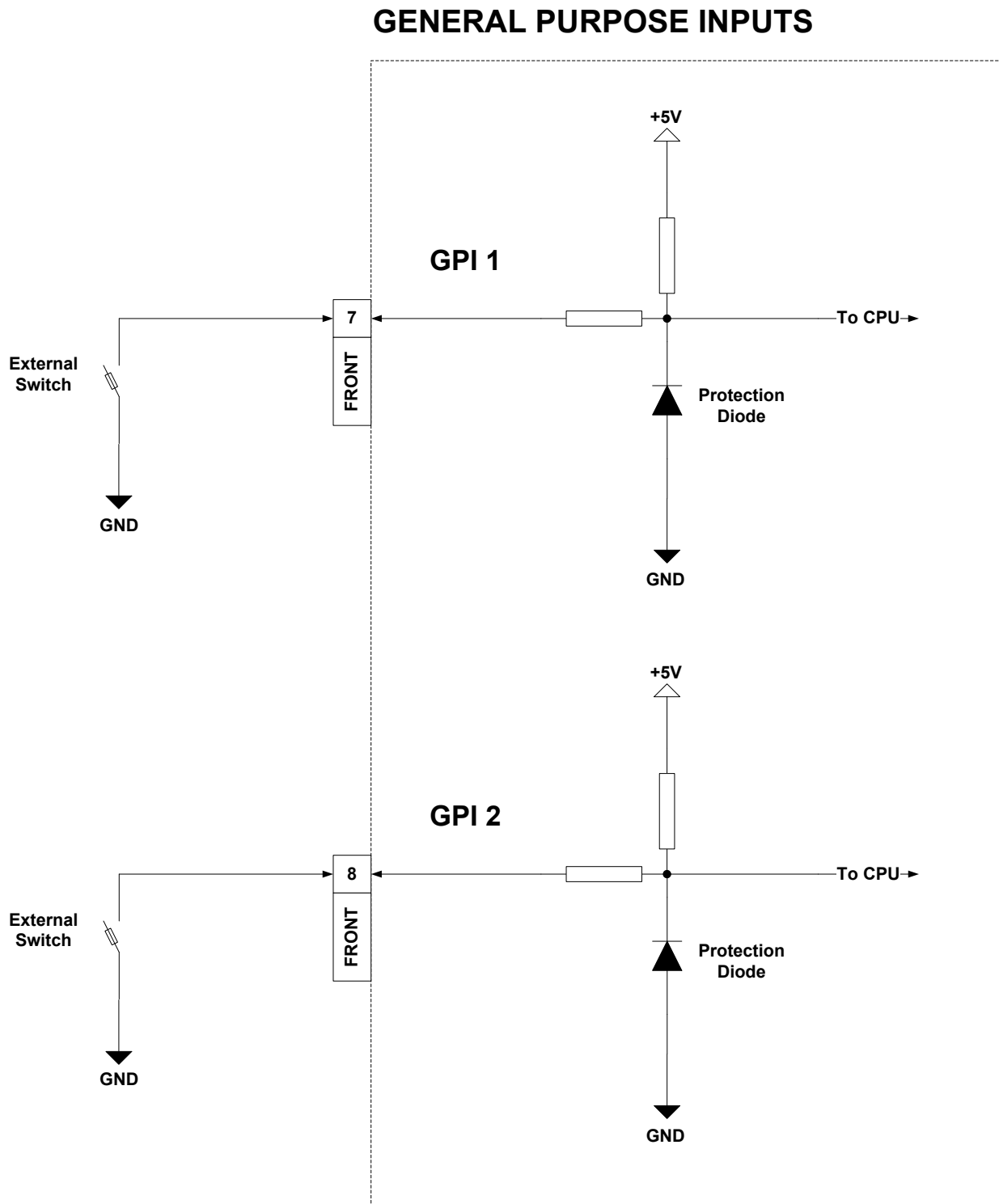Shown below is a schematic diagram of the relevant circuitry in the unit.

GENERAL PURPOSE INPUTS

USB Power

The CM5-LT is designed so that its processor can be powered from a PC's USB port. This functionality is intended to allow the user to configure the unit on the bench, outside of the vehicle. However, while powered only from the PC, the unit will NOT be able to read or operate circuit blocks that otherwise require the vehicle 12V battery power.

NOTE: If a laptop or a tablet is connected to the CM5-LT while it is installed in the car, the unit will remain ON even when the ignition is OFF. Ensure that you disconnect CM5-LT's USB cable from the laptop or tablet before turning the vehicle OFF.

Firmware Upgrade Procedure

From time to time, Torqbyte will release new versions of unit firmware which add new functionality or existing functionality improvements.

A detailed firmware upgrade procedure is described in the User Guide for our TorqTune PC software.

Warranty

Terms and Conditions

This Torqbyte product is warranted to be free from defects in workmanship and material for a period of one (1) year from the original date of purchase. Torqbye retains the sole and exclusive right to determine whether this warranty applies to the selected product, assume any obligation or liability, and undertake any action therein under the terms and conditions of this warranty.

This warranty is non-transferrable and applies only to the original retail purchaser. Warranty claims must include dated and authentic proof of purchase as well as pre-paid transit.

This warranty applies solely to the repair and replacement of the selected Torqbyte product, and shall under no circumstances exceed the original purchase price of the product.

Any misuse, improper installation, improper calibration or configuration, tampering, or misapplication of this Torqbyte product could result in property damage, injury, or death. Install and use this product at your own risk.

In no event shall Torqbyte be held liable whatsoever to you or any party related to you for any indirect, incidental, exceptional, consequential, special, exemplary, or punitive damages, injury, costs or lost profits incurred due to product failure or failure of any part of the product or this software, even if Torqbyte has been advised of the possibility of such damages. In any event, Torqbyte's total aggregate liability to you for all damages of every kind and type (regardless of whether based in contract or tort) shall not exceed the purchase price of the product.

In the event of a suspected defect, the consumer must contact Torqbyte via either the Contact Us Page at http://torqbyte.com/pages/contact-us or email, at support@torqbye.com in order to discuss the nature of the defect and attempt to resolve the issue. At Torqbyte's discretion, a Return Merchandise Authorization (RMA) number may be issued for a warranty return. Returns will only be accepted with an accompanying RMA number and may result in repair, replacement, or refund of the selected product.

torqbyte_ inc.
21 Antares Drive, Suite 101, Ottawa, ON K2E 7T8 Canada
torqbyte.com