

2021

**MB607
ELECTRIC WATER PUMP
INSTALLATION MANUAL**



MUXWIRING, INC.

April 13, 2021

Rev. A.

Thank you for using the MB607 with programming for water pump / lift pump.

IMPORTANT - PLEASE READ!

The procedures and instructions contained in this document are to be used as a general guideline. We intend for the end user to be the ultimate decision maker as far as the use of this device. If you, the end user of this unit, are uncomfortable or feel unsafe while using this unit or during installation, **DO NOT PROCEED and DISCONTINUE USE and seek assistance.** This unit is an advanced control module and is meant to be used by a user with experience with car wiring and safety. It is considered an advanced device to be installed by a user with skills and abilities that match the scope of a project of this magnitude.

This device is designed for use with vehicles used primarily as show-only, demonstration or race style cars and trucks. User should determine local, state and federal laws concerning use of a device of this type with this function and comply with laws accordingly. MUXWIRING, INC. makes No Warranties on any products it offers for sale, expressed or implied, as to function or operation.

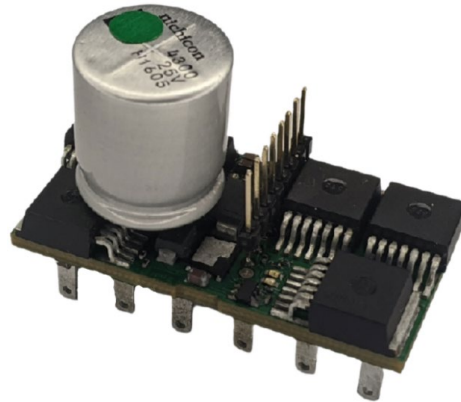
While use and testing were performed on this device, MUXWIRING, INC. cannot control the factors involved in the install and use of this device. All devices offered for sale are not intended for daily drivers. They are for off-highway and show car use only. The installation, use and programming of the device requires considerable time and skill to match. The user should determine suitability of device for the specific application before buying or attempting to install and use the device.

Purchaser ASSUMES ALL RISK in use of this product and is responsible for personal, property and economical injury related to use, proper or improper, installation, proper or improper, of this device. This would include any damage or injury directly or indirectly as a result of use of this device.

IF IN DOUBT, DO NOT USE, DO NOT PROCEED!

ATTENTION! PLEASE READ!

- All MB607 should be fused as indicated in this manual. Do not attempt to use module unfused.
- Ensure all MB607 and all accessories are well grounded to chassis.
- While the MB607 enclosure is weatherproof, also mount upright with wires at bottom. Make sure there is always a drip loop in wires from bottom. Water damage to module voids any warranties.
- Accessories should never exceed 7 amps sustained current for any one output, never more than 25A total module. If more current is needed, multiple outputs can be connected together to increase current as it adds together.
- NOTE: Pulsed current, such as a door popper, can be used in short bursts up to 60 amps.
- The power connections on the module are primary method of self-protection!
- The 12V supply on PIN A3 and GND pin B4 provide protection power.
- Power and Ground should be applied to MB607 when the vehicle has power.
- Never remove module fuse while vehicle is powered-disconnect battery ground first.

MB607**KEY FEATURES**

- Six high current solid-state outputs with polarity option/setting
- Up to 7A continuous outputs, 25A MAX per module
- Battery side current sensing on each of the 6 high power output channels
- Programmable circuit breaker and reset
- Seven 20V tolerant inputs with reading range from 0V to 16.2V
- All input, outputs and supply voltages can be read in software*¹
- Module internal temperature sensing and reading
- Two channels can be used for RPM and Speed inputs from 3V to max voltage range
- Active low or high input trigger support
- Typical Input impedance 10Kilohms
- Durable thermal and water rated housing available (IP67)
- Ultra-low current draw in standby <1mA at 12V
- Stand-alone or CAN bus networked up to 18 modules
- High Speed – CAN bus topology up to 1Mbps
- RealDash™ display support, configuration, and diagnostics*¹

¹ * -Requires optional programming cable and GUI tool

SPECIFICATIONS

- 7V – 16V DC (20V DC max) supply voltage with reverse voltage protection
- Maximum voltage on output channels cannot exceed power supply voltage
- Seven inputs can tolerate 5V above the supply voltage
- 7A per output
- Total output current draw combined 25A max
- Module must be externally fused 30A or less
- 60A max surge (300mS max)
- 85C max temp

ABSOLUTE MAXIMUM RATINGS

PARAMETER	PIN NAME	VALUE
VOLTAGE RANGE	BATT 12DC	0V to 20DC
OUTPUT DRIVE	I/O x (1-6)	Output drive source, 60A max (300 mS max) single channel only
OUTPUT DRIVE	I/O x (1-6)	Continuous drive current, 7A max (25A total all channels)
INPUT	I/O x (1-7)	Input range 0V to supply voltage + 5V (max 20V)
PWM	I/O x (1-6)	PWM drive, 100 Hz to x 1kHz (limited drive to 25kHz), 0 to 100% duty
CURRENT SENSE	I/O x (1-6)	Current sense on each pin, 0.5A to 30A range (accuracy +/- 1A typical)
STORAGE TEMPERATURE		-20 to 85C no operation

RECOMMENDED OPERATING CONDITIONS

PARAMETER	PIN NAME	VALUE
VOLTAGE RANGE	BATT 12DC	7V – 16.2V DC typical
OUTPUT DRIVE	I/O x (1-6)	7A typical each pin, max
INPUT	I/O x (1-6)	Input range 16.2V
PWM	I/O x (1-6)	PWM 100 Hz to x 500Hz
CURRENT SENSE	I/O x (1-6)	Current sense on each pin, 0.5A to 30A range
ANALOG INPUTS	IN x (7-13)	DC input, ADC in, 0V to battery voltage - trigger detect programmable

TECHNICAL DESCRIPTION

The MB607 is a fully programmable module using proprietary command language. Simple to learn yet very powerful. The module is designed for a variety of input and output settings to leverage our advanced programming capabilities. MB607 commands can be updated individually or distributed over network with common and inexpensive tools. MB607 has a wide operation temperature range and should be mounted in an environmentally sealed water-resistant housing.

The MB607 module has seven dedicated analog or digital inputs with voltage wake-up trigger threshold. The MB607 has six channels high power output drive, source or sink. Two channels can be paired as single push-pull drive for locks or power window drive with current sense on each channel for current limit-switch protection. The MB607 comes with many different standard configurations or can be ordered with custom programming.

INSTALL TIME TYPICALLY 1 - 2 HOURS

UNIVERSAL ELECTRIC WATER PUMP (EWP) CONTROLLER W/DUAL FAN SUPPORT

TOOLS NEEDED

- Drill with various size drills
- Mounting screws or bolts
- Quality 12 and 18 gauge wire
- Star washer
- IN-LINE FUSE 25A max
- Metro-Pack crimper (similar to Delphi # 12085271)
- Engine Coolant Temperature Sensor

NEEDED FOR DUAL FAN SUPPORT

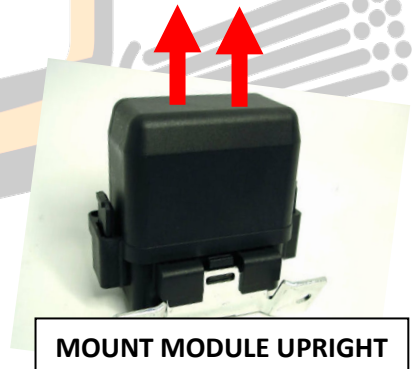
- 20A typical Relay

INSTALLATION PROCEDURE

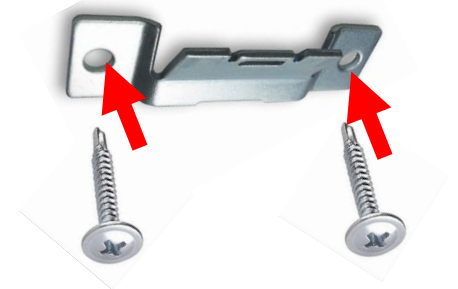
DISCONNECT BATTERY GROUND!!!



Noting the size of the assembled enclosure, remove lid from weatherproof enclosure. Attach mounting bracket to enclosure base, find a suitable place to mount the enclosure. Make sure module is mounted upright, never mount near excessive heat source or in an excessively wet location. The ideal location would minimize the wire length between the battery source and your accessories to be powered. Shorter wire runs always yield best results.



Use screws or bolts, nuts and washers to mount bracket to chosen location. Ensure that the chosen area is clear of objects, once verified, drill and attach mounting bracket. Remove the mounting bracket from base and use as a drilling template. Holes should not exceed bracket hole size.



CONNECT MODULE GROUND

Using a Metri-pack crimper, attach a 12 gauge or larger wire to correct Metri-pack 12077413 connector and seal. Crimp a ring connector on other end and attach to quality ground. This can be frame or chassis if well grounded. Remove paint. Use star washer. Insert Metri-pack connector into B4 slot in weatherproof base. See Figure A.



CONNECT 12V SUPPLY

Using a Metri-pack crimper, attach a 12 gauge or larger wire to correct Metri-pack 12077413 connector and seal. This wire will be 12V supply. There should be a fuse installed in this wire feeding the Module power supply. Connect Metri-pack pin to weatherproof base slot A3. See Figure A.



CONNECT INPUTS and OUTPUTS

1. Connect pins B5 and B6 to thermal water sensor in engine block. Polarity is not important.
2. Connect pin C2 to Fan 1 relay low. Make sure Fan relay high side is connected to 12V ignition fused.
3. Connect pin A6 to water pump positive. Make sure water pump negative is grounded to good ground.
4. Connect pins C3 and C4 in parallel to Fan 2 positive. Make sure Fan 2 negative is connected to ground.
5. Connect pin B1 to ignition on. This will be ignition sense pin for module.
6. Connect pin B2 to AC ON switch. This pin will be low (ground) when AC is normally on.
7. Connect pin A2 to AC OVER PRESSURE switch. This pin will be low (ground) when AC is on and pressure is OVER 200PSI.
8. FOR USE WITH LIFT PUMP, SEE ADDENDUM!

PLUG UNUSED PINS

Using a Metri-pack Blocker plugs (#12010300), insert into any unused sockets in bottom of base.



ATTACH STRAIN RELIEF

Attach the 3 strain relief clips aka Terminal Position Assurance Locks (TPA) on bottom of weatherproof base over wires.

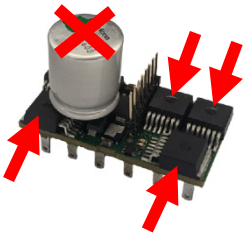


INSERT MB607 MODULE

Note that there is an unused pin in module, B3. This is alignment key. Note the module has corresponding pin missing. Insert module so missing pin lines up with unused B3. Ensure pin alignment, then press firmly on module to seat in base.



Try to confine pressure to black colored perimeter components - do not press on silver cylinder! Replace lid.



RECONNECT BATTERY AND TEST

Reconnect negative battery post and confirm function of each input and output.



ADDENDUM 1-24 (Lift Pump ADDITION)

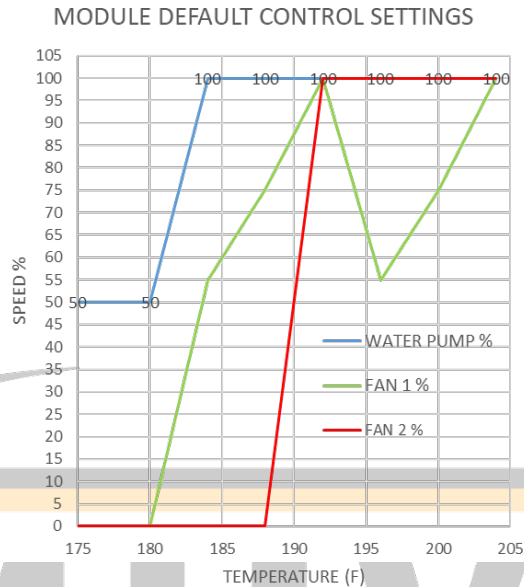
PLEASE NOTE: ONLY CERTAIN PUMPS ARE QUALIFIED - PLEASE ASK FOR DETAILS

- Hydraulic pump added to system, differentially driven. PINS C1 and C5
- Pump control is done by SPDT, center relax floating momentary switch to PIN A4
- The input is single wire, when connected to 12V-pump goes up; when connected to ground, pump goes down. The system assumes floating when off.
- ANY TIME LIFT PUMP RUNS, locally connected fan motor will be cut off. That is done to keep current from exceeding module maximum current.
- It is understood that the cut-off of main fan during pump control will occur when pump is running and will be limited to short bursts and never **exceed 20 seconds** of use.



MB607 (EWP) OPERATION DETAILS

The MB607 Module is fully programmable. This Module use with EWP program is defined as follow:



1. Module senses water temperature.

WHILE IGNITION IS ON, AC off:

- a. When temperature is below 184f-fan off, water pump at ~50% duty.
- b. When temperature is 184f- Fan 1 is off, fan 2 is on, 55% duty, pump is 100% duty.
- c. When temperature is 188f- Fan 1 is off, fan 2 is on, 75% duty, pump is 100% duty.
- d. When temperature is 192f- Fan 1 is off, fan 2 is on, 100% duty, pump is 100% duty.
- e. When temperature is 196f- Fan 1 is ON, fan 2 is on, 55% duty, pump is 100% duty.
- f. When temperature is 200f- Fan 1 is ON, fan 2 is on, 75% duty, pump is 100% duty.
- g. When temperature is 204f- Fan 1 is ON, fan 2 is on, 100% duty, pump is 100% duty.

WHILE IGNITION IS ON, AC ON, pressure is normal:

- a. unconditional- Fan 1 is OFF, fan 2 is on, 75% duty, pump is 100% duty.
- b. When temperature is 192f- Fan 1 is off, fan 2 is on, 100% duty, pump is 100% duty.
- c. When temperature is 196f- Fan 1 is ON, fan 2 is on, 55% duty, pump is 100% duty.
- d. When temperature is 200f- Fan 1 is ON, fan 2 is on, 75% duty, pump is 100% duty.
- e. When temperature is 204f- Fan 1 is ON, fan 2 is on, 100% duty, pump is 100% duty.

WHILE IGNITION IS ON, AC ON, pressure is HIGH:

- a. UNCONDITIONAL - Fan 1 is ON, fan 2 is on, 100% duty, pump is 100% duty.

WHILE IGNITION IS OFF:

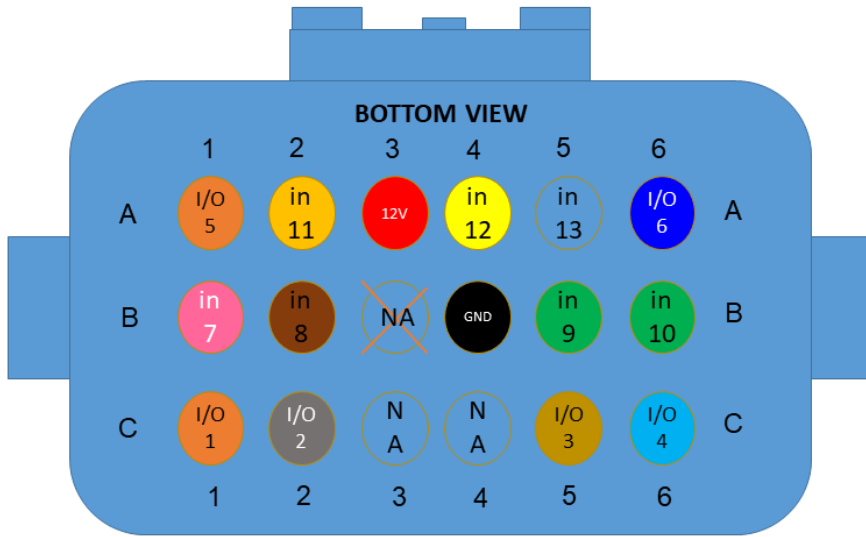
- a. 5 minute timer starts, fans follow normal temperature cooling EXCEPT;
 1. Battery voltage falls below 11.0V.
 2. Temperature drops below 175F.

BOTH CASES RESULT IN FANS OFF, PUMP OFF.

MODULE TROUBLESHOOTING/TEST METHODS

1. Ensure 12V and ground are connected properly, pay special attention to ground connection (free of paint, rust, dirt and such-use of good star washer is recommended).
2. Ensure user fuse is good and 12V is fed into module.
3. Open top cover of module.
4. An amber colored LED is visible in center of module. When ignition is off, LED should blink slowly (~2 second cycle). When ignition is on, LED should blink fast (several times per second).
5. While ignition is on, the wires that connect the engine block water temperature sensor (module pins B5, B6) may be removed; immediately the fans should turn on 100% and the water pump should turn on 100% (this is a fail-safe feature of module).
6. While ignition is on, grounding the "AC ON" module pin B2 will result in one fan turning on 75%, water pump 100%.
7. While ignition is on, grounding the "AC OVER PRESSURE" module pin A2 will result in both fans on 100% and water pump at 100%.
8. ALWAYS REPLACE TOP COVER WHEN COMPLETE.





Pin functions DEFINED

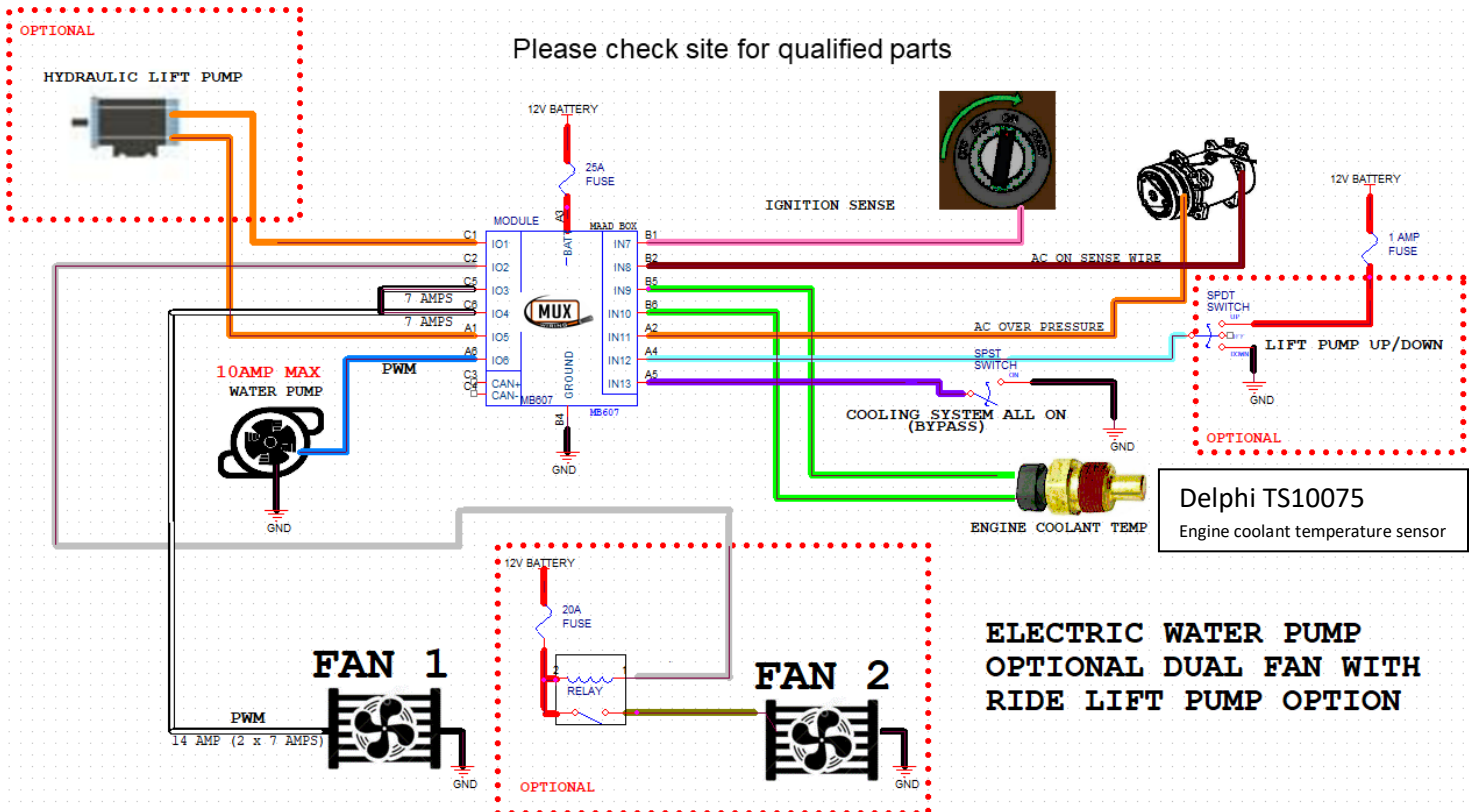
PIN NUMBER	FUNC NAME	DESCRIPTION
C1	I/O 1	PUMP (UP WHEN HIGH)
C2	I/O 2	FAN RELAY DRIVE (LOW OUTPUT)
C3	TBD+	NOT POPULATED
C4	TBD-	NOT POPULATED
C5	I/O 3	FAN PWM 1 (7 AMP)
C6	I/O 4	FAN PWM 2 (7 AMP)
B1	IN 7	IGNITION SENSE
B2	IN 8	AC ON (LOW ENABLED)
B3	ALIGNMENT	KEYWAY
B4	GND	MAIN MODULE GROUND
B5	IN 9	WATER TEMP SENSOR 1
B6	IN 10	WATER TEMP SENSOR 2
A1	I/O 5	PUMP (DOWN WHEN HIGH)
A2	IN 11	AC OVERPRESSURE IN (LOW ENABLED)
A3	BATT 12DC	MAIN BATTERY VOLTAGE ALWAYS ON
A4	IN 12	PUMP SWITCH
A5	IN 13	BYPASS COOLANT ALL
A6	I/O 6	WATER PUMP DRIVE (HIGH)

Model MBOX607_EWP Module

- = 12V ALWAYS ON (FUSED, 25 A MAX)
- = GROUND



Please check site for qualified parts



MUXWIRING, INC. warrants against any defects in materials and workmanship to MUXWIRING MB607 module, wiring harnesses and accessory modules for a period of one (1) year from the first date of purchase. Subject to the terms of this warranty described below, MUXWIRING, INC. will replace any such defective product that is returned to MUXWIRING, INC. within the one (1) year period from initial purchase. Replacement of any defective part or product will not extend the applicable warranty period. The warranty does not apply to: (i) any product that is not installed in compliance with the applicable product documentation; (ii) any defect in, or failure of, the product resulting from an accident, shock, negligence, water immersion or misuse; (iii) any product that has been modified, adjusted, repaired, or disassembled by any party other than MUXWIRING, INC.; or (iv) any defect other than in materials and workmanship. This warranty covers only the original purchaser of product purchased from a MUXWIRING, INC. authorized dealer in the United States. In order to receive warranty service, purchaser must provide MUXWIRING, INC. with a copy of the receipt stating the dealer name, product purchased and date of purchase. Products found to be defective during the warranty period will be replaced (with a product deemed to be equivalent or better) at the discretion of MUXWIRING, INC. MUXWIRING, INC.'s sole liability for any defective product is limited solely to the replacement of product pursuant to this warranty. MUXWIRING, INC. reserves the right to replace any repairable parts with new or refurbished parts. MUXWIRING, INC. DISCLAIMS ALL OTHER WARRANTIES, WHETHER EXPRESS, IMPLIED OR STATUTORY, SUCH AS WARRANTIES OF MERCHANTABILITY AND FITNESS FOR PURPOSE. IN NO EVENT SHALL MUXWIRING, INC. BE LIABLE FOR ANY PUNITIVE, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES, INCLUDING WITHOUT LIMITATION, LIABILITY FOR LOSS OF USE, LOSS OF PROFITS, LOSS OF PRODUCT OR BUSINESS INTERRUPTION HOWEVER THE SAME MAY BE CAUSED, INCLUDING NEGLIGENCE.

AVAILABLE AS A KIT



- MB607 Module
- Weather Sealed Housing
- Mounting Bracket



- Metri-Pack 280 Crimp on ends
- Wire Seals
- Terminal Position Assurance Locks (TPAs)