

Alpha-N plus



**Assembling Instructions
BMW M3 E30**

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1 Introduction

1.1 Disclaimer

Liability claims against the vendor regarding damage caused by the fitting, application and use of the Alpha-N-Controller Unit provided will be rejected, except in cases of defects in materials and workmanship.

1.2 Safety hints

Incorrect wiring of the Alpha-N can destroy the Alpha-N Module or the ECU (Motronic) (see 1.1).

1.3 Assumption

This manual refers only to the vehicle type **BMW M3 E30** and covers all standard engine variants (195PS, 215PS, Evo1, Evo2 and SportEvo).

The Alpha-N plus Module acts as an attachment to the OEM (Bosch Motronic) ECU.

The Air Temperature Sensor (part of delivery) must be placed in the Air Intake System.

1.4 Delivery

- [1] Alpha-N plus module
- [2] Throttle potentiometer (also called Throttle Position Sensor, Throttle Pot or TPS)
- [3] Air temperature sensor
- [4] Alpha-N wiring harness
- [5] Connector housing for the adapter harness (Throttle Position Sensor)
- [6] Adapter harness (Throttle Pot)
- [7] 10 Crimp Sockets AMP (Motronic-Connector) (+2 reserves)
- [8] Ground wire ring connector
- [9] 5 crimp sockets (adapter-harness throttle pot.) (+2 reserves)
- [10] 10 cable ties, medium size (Alpha-N mounting, Cable fixing)
- [11] 3 cable ties, large size (Alpha-N mounting)
- [12] Weave tape
- [13] Heat shrink tubing

Option ShiftLights

- [15] Connector housing, AMP Mate-N Lok
- [16] 7 crimp sockets (+1 reserve)
- [17] 2 Screws

1.5 Required Tools

- ¼-in. ratchet with extension and 10mm socket
- Phillips screw driver (medium size)
- Edge cutter
- Flatt head screw driver (small size -> 3mm)
- Pinout tool to remove the sockets of the ECU (Motronic) connector
- Crimping tool

2 Installation Throttle Pot Harness

2.1 TPS - Throttle Position Sensor

The TPS (Throttle Position Sensor [2]) replaces the original throttle position switch.

- Unscrew the two throttle switch screws.
- Remove the throttle switch from the throttle spindle/shaft.

Note! Sometimes the sealing ring of the throttle shaft will stick on the flange and need to be removed in that case.

- Remove the connector from the throttle switch.
- Refasten this connector to the harness of the injectors (using cable ties [10]).



- Route the TPS-harness [6] along the alternator cable and underneath the Airbox. Fasten it at about 3 points (using cable ties [10]).



- Plug the TPS connector into the (still loosely fastened) TPS [2] and clamp it.



- Push the TPS onto the throttle shaft (therefore, open the throttle a little).
- Screw in the two screws. Tighten the screws first and then unscrew them a little again. When releasing the throttle there must be a quiet clicking sound (This is a switch inside the TPS).



2.2 Air Temperature Sensor

The original air temperature sensor is part of the Air Flow Meter (AFM). Since the AFM will be removed, a separate temperature sensor needs to be placed in the air intake system. This separate Sensor [3] is part of the delivery.

It is normally screwed into a fixture found on the Airbox.



- Plug onto



- Run the harness in front of the holder for the AFM



2.3 Interface to the Engine Harness

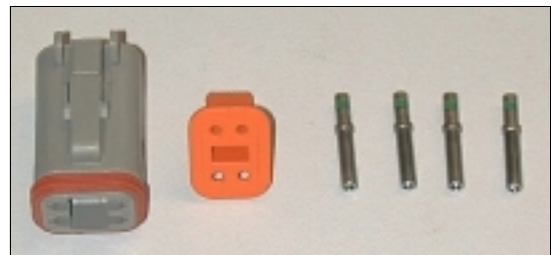
The interface to the engine harness will be implemented by an additional connection. Therefore the original AFM-connector must be removed.

Both "Deutsch DT04" as well as "AMP Super-Seal" connectors are in use.

The documentation shows the installation using the Deutsch connectors.



AMP Super-Seal



DEUTSCH DT04

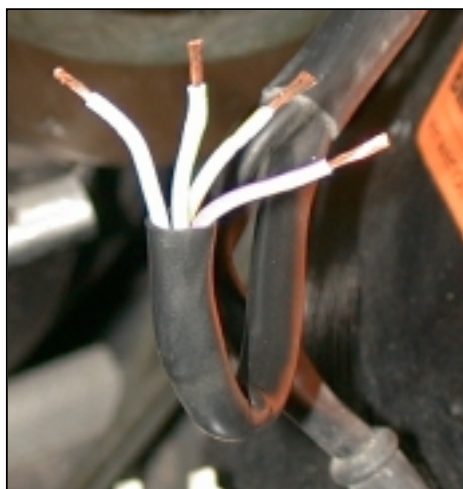
- Pull the rubber bushing back



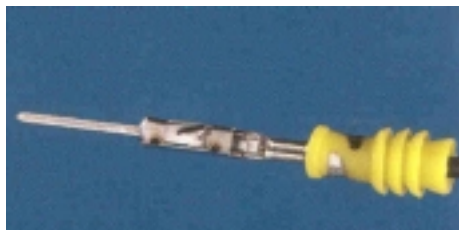
- Cut the four wires as close as possible to the connector housing



- strip wires about 0.2 in.



- Crimp sockets [9] (female) onto the wires...



Crimping the single wire sealing of the AMP Super-Seal connector



- ... and assemble the connector please refer to the added schematic.

terminal	color
1	gray/purple
2	gray/yellow
3	gray/white
4	brown/orange or gray/green

Same order as the original positions!



- Screw the connector holder in (not used with AMP)



- Push the connectors together



- Fasten the harness with cable ties [10]



The assembly of the TPS harness is now complete.

Note, that the screws of the TPS are not tightened at this point. This must be done after adjustment with the PC-Software used to program the Alpha-N module.

3 Installation Alpha-N Harness

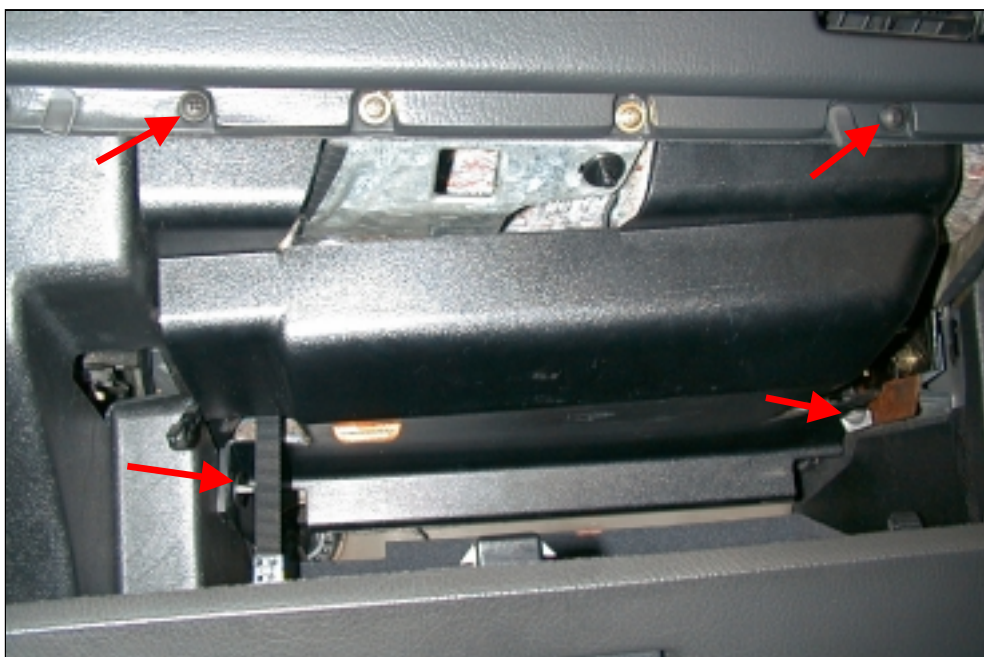
3.1 Basics

Since there is no specific recommendation for the placement of the Alpha-N-Module, the user is free to fit the module somewhere around the ECU. But, it's better to position the module as close as possible to the ECU to allow shorter wires (better EMI immunity).

In the following, the documentation describes placement behind the ECU directly above the glove compartment.

3.2 Preparation

- Open the glove compartment and remove the two screws and the plastic pins shown below



- Right strap: Turn the upper end clip 90 degrees and unhook.
Lift the clip upwards through the hole.
Turn 90 degrees back.
Remove the clip downwards through the hole.
- Left strap: Remove the pin in the glove compartment.

- Remove the two connectors from the lamp

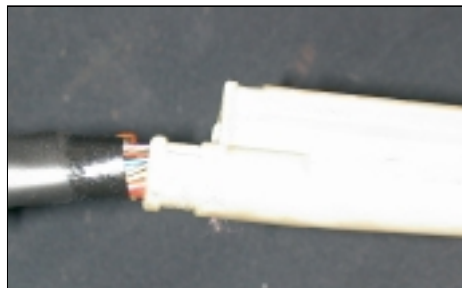


3.3 Wiring

- Remove the Motronic connector and loosen the screw of the common ground.



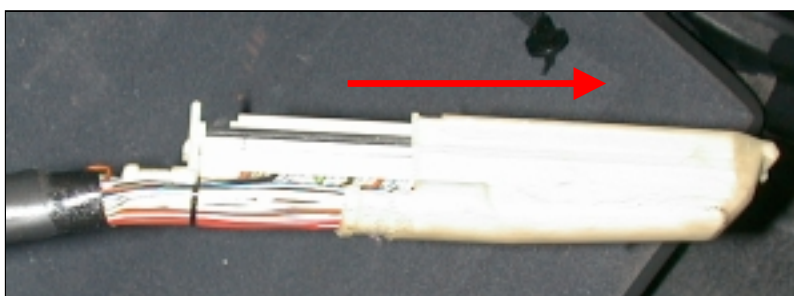
- Remove the weave tape from the connector



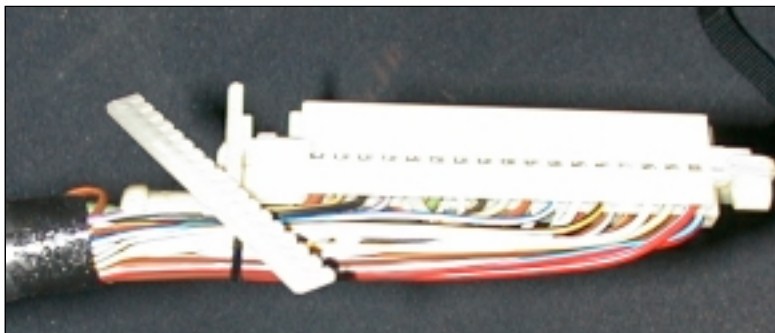
- Unscrew the screw in the end of the ECU (Motronic) connector



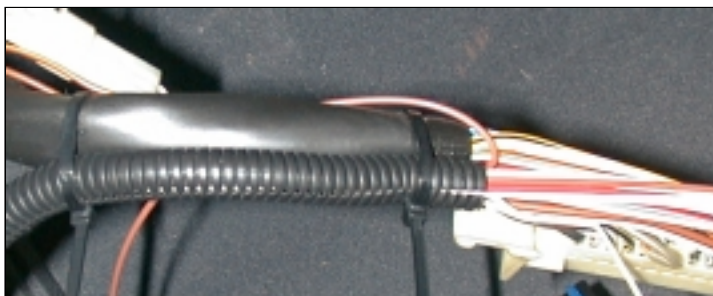
- Remove the connector housing by pulling in the direction as shown below



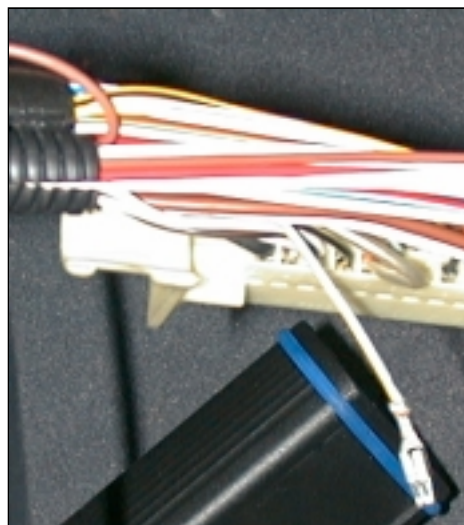
- Remove the Pin-Lock-Strip



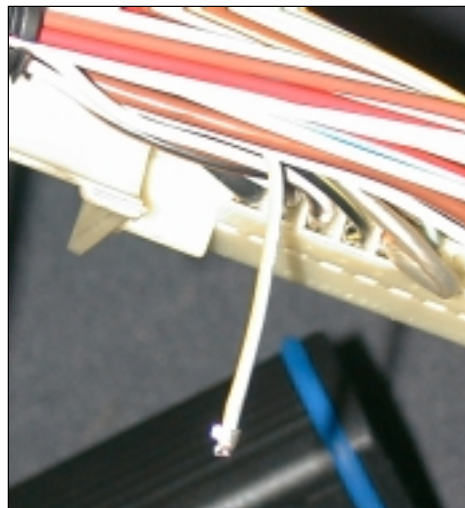
- Determine where the Alpha-N Module will be placed.
Feed the Alpha-N harness to the position where the engine harness comes into the compartment and run it along the engine harness up to the ECU (Motronic) connector.
Cut the cover hose at the same position, where the cover of the engine harness ends.
Fasten the harnesses together at two points using cable ties.



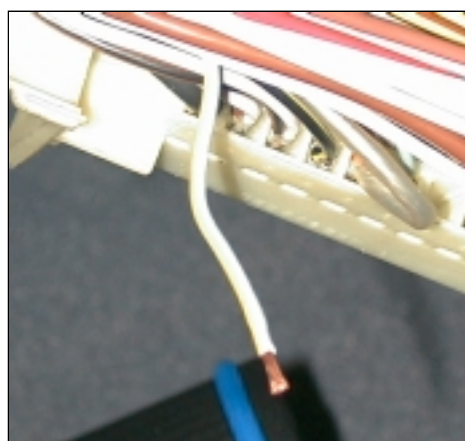
- Pull out one socket after another, starting with the lowest Terminal number (2)



- Cut the socket contact in the middle to save wire length. (Do not cut sockets of pins 2 and 3. Just lay these wires back)



- Pull off the rest of the socket and strip the isolation about 0.2 in.



- Hold the appropriate Alpha-N wire to its target position with a light bow and cut the wire at this position. Strip the isolation about 0.2 in..
The Alpha-N wires are labeled with the number of the target terminal.

Terminal	Function
2	Idle Contact (brown/blue)
3	Full Contact (brown/black)
6	GND (brown/orange + gray/yellow)
7	AFM Signal Input (gray/yellow)
8	PPU
9	5V Reference (gray/white)
18	+12V (red/blue)
24	Lambda (Narrow band) Signal
33	Idle Valve Position



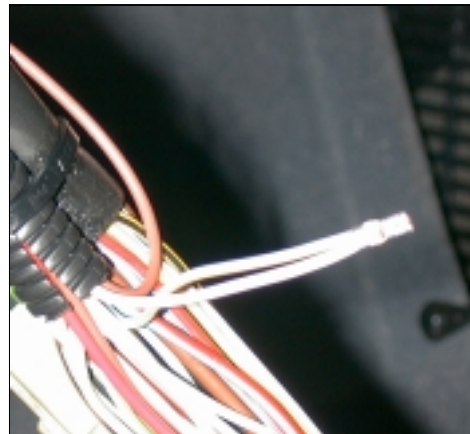
- Crimp both wires together into a new socket (Wires of terminal 2, 3 and 7 are single wires). Push the socket into the Motronic connector.
NOTE! Pay attention of the right direction.

The handling of the number 7 wire (gray/yellow) of the engine harness and the wires corresponding to terminals D and G of the Alpha-N-Harness deviates slightly from the procedure described above.

In this case:

Crimp together the wire of terminal 7 (gray/yellow) from the engine harness together with wire G-Pot (TPS) of the Alpha-N harness. Use a standard socket connector for the connection and cut the contact part off. Use the provided shrink tubing [13] to isolate this splice. Bend the two wires back into the hose. Wire D of the Alpha-N harness will be inserted into the terminal position 7 of the Motronic connector.

- Crimp the wire of terminal 7 (gray/yellow) together with wire “G-Pot” of the Alpha-N harness



- Isolate the splice with shrink tube [13]



Finally, screw the one ground wire R onto the common grounding point.

- Run the wire along the engine harness up to the common grounding point..
- Cut the Wire to correct length
- Crimp the ground ring connector [8] onto the wire
- Screw the wires on



- Fasten the wire to the engine harness

Reassemble the Motronic connector. Wrap the connector input with weave tape [12] and secure the bundle with a cable tie [10]. Don't forget the screw on the other end of the connector.

The assembling is now complete.

The next step will be the function test and the adjustment with the PC.

Addendum

If the idle valve is not used (some racing setups), wire 33-J can be left open.

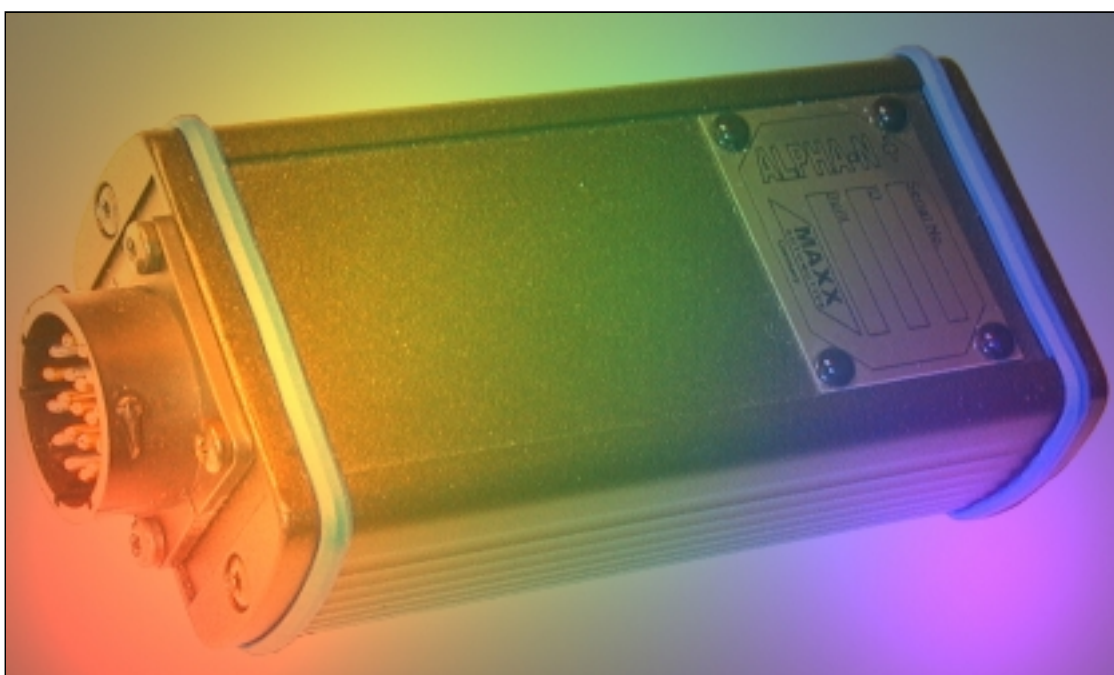
If you don't want to view the signal of the oxygen sensor or no oxygen sensor is in use, the wire 24-E can be left open.

3.4 Mounting of the Alpha-N Module

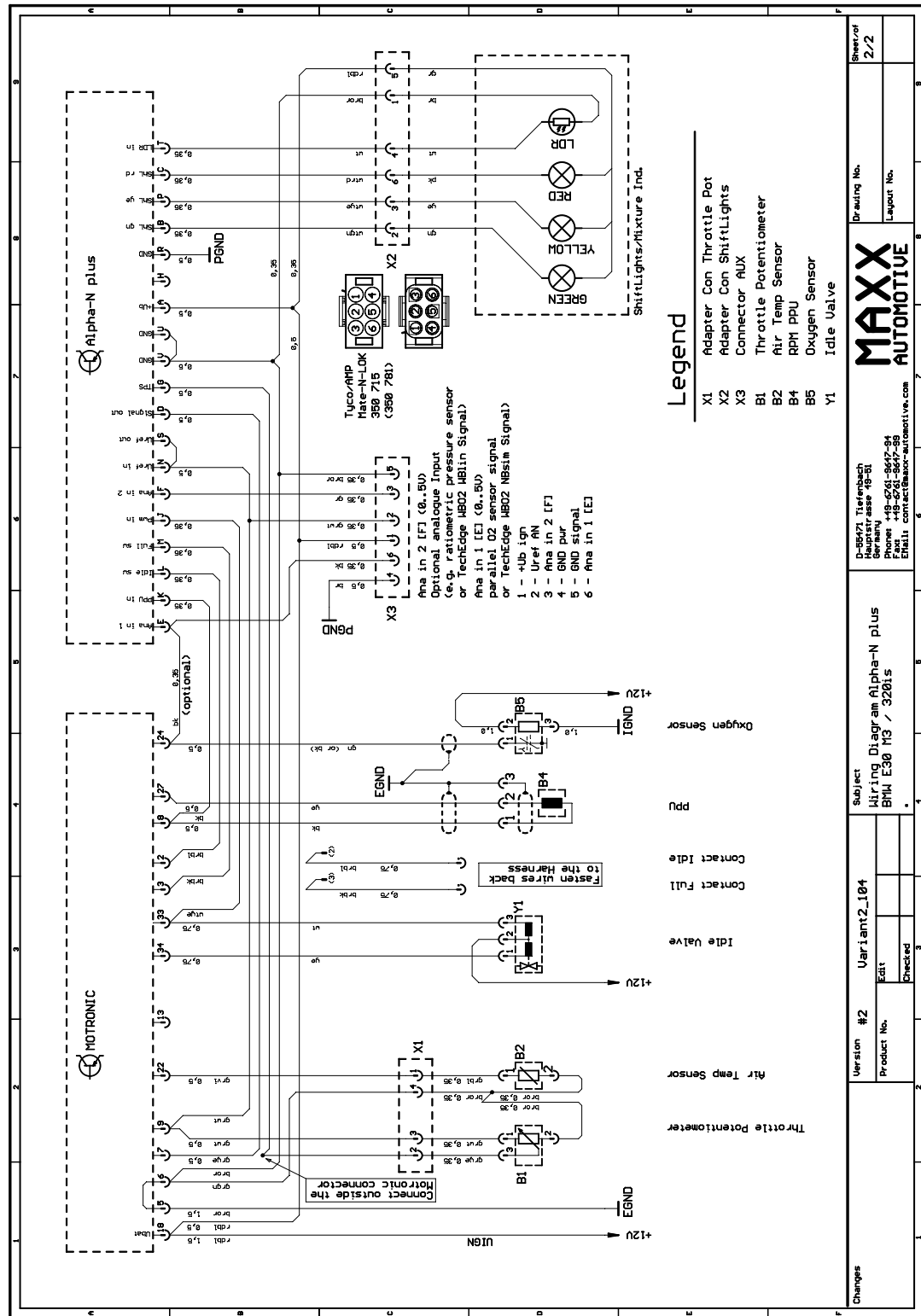
The Alpha-N Module does not have any screw wholes for fitting as there are many different applications. Practice has shown that it is sufficient to fasten the module by using some cable ties [11] or [10].

If the module should be placed underneath the dashboard it can be placed right behind the ECU (Motronic).

NOTE! The communication Interface will be blocked in that case. So, do the adjustments before recover the ECU compartment.



4 Wiring Diagram



5 Optional ShiftLights

ShiftLights are an additional Option of the Alpha-N to view adjustable RPM-Limits or mixture tendencies (Air/Fuel ratio).



There are four Variants available

Two variants called "open": Three loosely delivered LEDs (super bright) together with a light-sensor and some connectors [15] and [16]. The user is responsible for the installation and the wiring.

5.1 ShiftLights „basic open“

LEDs 8mm



5.2 ShiftLights „professional open“

LEDs 18mm



Two variants called "module": Three LED's (super bright), together with a light-sensor already assembled in a black box. Fitted with a 1,5m flat Cable. The connector are delivered loosely. After running the cable in a proper manner down to the Alpha-N harness, the connector plug needs to be assembled and plugged into the harness connector.

5.3 ShiftLights „basic module“

LEDs 8mm



5.4 ShiftLights „professional module“

LEDs 18mm



6 Appendix

6.1 Pin- table of the motronic main connector

Motronic pin	wire color	Alpha-N pin	Description
2	brown/ blue	L	The original wire does NOT need to be tied together with the new wire from the Alpha-N harness and can be put aside the engine harness outside the motronic connector.
3	brown/ black	M	The original wire does NOT need to be tied together with the new wire from the Alpha-N harness and can be put aside the engine harness outside the motronic connector.
6	brown/ orange ----- gray/ green	U/V	Crimp both together. Set into terminal 6.
7	gray/ yellow	D G	<ul style="list-style-type: none"> Remove the original wire from terminal 7 and crimp it together with the POT-G wire of the Alpha-N harness. Isolate the splice with shrink tube and put it aside the engine harness outside the motronic connector. Crimp a pin onto the 7-D wire of the Alpha-N harness and set it into terminal 7 of the motronic connector.
8	black	K	Crimp both together. Set into terminal 8.
9	gray/ white	N/S	Crimp both together. Set into terminal 9.
18	blue/ red	A	Crimp both together. Set into terminal 18.
24	black	E	Crimp both together. Set into terminal 24.
33	white/ yellow	J	Crimp both together. Set into terminal 33.

MAXX-automotive GmbH
Hauptstrasse 49-51
55471 Tiefenbach
Germany

Phone: +49 6761 9647 94
Fax: +49 6761 9647 99

Email: contact@maxx-automotive.com

Web: <http://www.maxx-automotive.com>