CORNERING LIGHTING MODULE
CLM02-CAN
INSTALLATION MANUAL

ISO 9001
ZETOM-CERT

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OPERATION WITH USB BOOTLOADER
The firmware can be updated with the USB Bootloader programming interface available from
Quasar Electronics

GENERAL INFORMATION

The CLM02-CAN module is designed for mounting in cars with +12V electrical installation equipped with CAN-bus. The module interpreting CAN-bus messages realizes number of functions that inrease driving safety and comfort:

- Passive lighting the corners using fog headlights (halogens) during turning the car;
- Controlling of the front parking sensors;
- Day ligths realized with road ligths with decreased brightness;
- Temporary illuminating the space in front of the car after finishing the drive (Coming/Leaving Home function).

THE KIT CONTAINS:
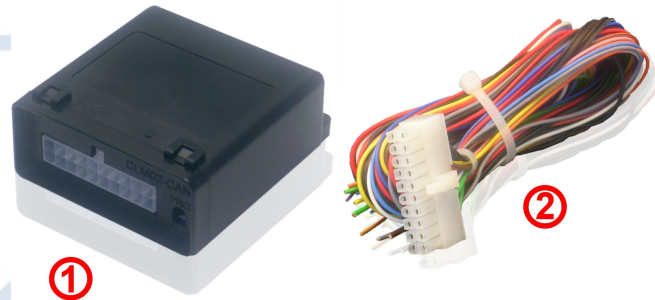
- CLM02-CAN central unit   - 1 pc.
- CLM02-CAN-W20 wire harness   - 1 pc.

MODULE LOGICAL FUNCTIONS

Main module functions:

- Passive corners lighting realized by turning the left fog headlight on durning turning to the left and turning the right fog headlight on durning turning to the right;
- Day ligths realized with road lights with decreased brightness;
- Passive illuminating the space in front of the car after finishing the drive (Coming/Leaving Home function).

Additional module functions:

- Output for controlling the front park sensor.

> ⚠ Realization of the particular functions by the CLM02-CAN module depends on the corresponding CAN-bus message availability which depends on the particular car make and type.
> The up to date list of handled car makes and types with CAN-bus messages available is presented on the manufacturer's website **www.quasarelectronics.pl**

STANDARD passive cornering lighting

Module realizes the passive cornering lighting function using the installed in car fog headlights.

The module turns on the left (or right) fog headlight with full brightness when:

- The car is speed is in 0-40 km/h range;
- The steering wheel left (or right) turn angle is greater then 20 degrees;
- The parking lights are turned on;
- The engine work status is active;
- The fog headlights are turned off.

PROGRESSIVE passive cornering lighting

Module realizes the progressive cornering lighting function using the installed in car fog headlights.
The brightness of cornering lighting depends on steering wheel turn angle. The Pulse Width Modulation (PWM) control is used for changing the corner lighting brightness. When the steering wheel is turned with the angle greater than 20 degrees the fog headlight are turned on with full brightness.

The module turns on the left (or right) fog headlight when:

- The car is speed is in 0-40 km/h range;
- The steering wheel left (or right) turn angle is greater then 4-5 degrees;
- The parking lights are turned on;
- The engine work status is active;
- The fog headlights are turned off.

Day lights

Module realizes the day light function using the installed in car road lights.

The fog headlights are turned on with half of the full brightness, the decreased lighting level is obtain by PWM control of the fog headlights bulbs.

The module turns on the day lights after 5 seconds when the following conditions are accomplished:

- The engine work status is active;
- The parking lights are turned off;
- The fog headlights are turned off;
- The road lights are turned off;
- The handbrake is released (function available in CLM02-CAN from 05/2011).

The module turns off the day light when one of the following conditions is accomplished:

- The engine work status is inactive
- The parking lights are turned on;
- The fog headlights are turned on;
- The road lights are turned on;
- The handbrake is pulled-up (function available in CLM02-CAN from 05/2011).

Passive illuminating the space in front of the car after finishing the drive (Coming/Leaving Home function)

Module realizes the function of controlling the installed in car fog headlights and dedicated "Coming/Leaving Home" output for additional illuminating the proximity of the car after finishing the drive. This function is useful when the car parking place is distant from the house door.

The module activates this function when after finishing the drive, the short blink of road ligths is made. The module activates the function for 30 or 60 seconds (dependently on "Coming/Leaving Home" function setting) when:

- The ignition is turned off after finishing the drive with the parking lights turned on (information that the car was driven by night). The time period between turning the parking lights off and turning the ignition off is 60 sec;
- The short blink of road lights is made;
- any door is opened;

The function is activated at the moment of door opening.
Turning the ignition off while the function is active causes its immediate termination.

Front park sensor control output

The output which is set to +12V/1A when the car speed is lower than 10 km/h and the ignition is turned on. When the car speed exceeds the 10 km/h the output turns the +12V off (powering of the front park sensor).

MODULE SETTINGS CONFIGURATION

SELECTING CAN-BUS INTERFACE PROGRAM

The CLM02-CAN module handles above than 150 car makes and models and by reason of proper CAN-bus messages interpretation there is need of choosing the proper CAN program number during the module installation.

> ⚠ The up to date list of handled car makes and types with corresponding CAN program numbers is available on manufacturer's website **www.quasarelectronics.pl**

For choosing the proper CAN program number you should:

- Turn the ignition off;
- Press and hold the PRG button for approx. 5 seconds until the LED goes on. Then within 2 sec. release the button and LED will go out. After this procedure, the module is in the programming mode;
- The LED starts flashing sequentially. The number of flashes represents the number of the program. A two-digit number defines the program number; each digit can range from one through nine. The first and the second digit of the program number are selected by a single momentary push of the PRG button after required number of LED flashes. Each digit must be selected separately;
- After confirmation of the second digit choice, the program is selected for saving in the memory.

    Indication of proper program selection: LED – three flashes

    If the PRG button is not pressed within 15 sec. the programming mode is abandoned.

    Program choice error is indicated with a 3 sec. long LED flash.

The requested CAN program number choice can also be made in the module configuration program **"CLM01-CAN Bootloader"** available from the manufacturer's website to download.

THE FIRMWARE UPDATING

Due to new car models are being developed, the handled CAN-bus protocols must be still updated. The CLM02-CAN modules offer possibility of updating the firmware with actual CAN-bus protocols. For updating the firmware in the devices produced by **QUASAR Electronics**, the special interface Q-CAN BOOTLOADER has been developed. To update the CLM02-CAN firmware you need the Q-CAN Bootloader with special cable fitting to CLM02-CAN module. Interface works with special configuration program **"CLM01-CAN Bootloader"** available from the manufacturer's website to download.

The updated firmware for particular CAN alarms and modules can be downloaded from the manufacturer's website (see tab *Drivers/Software* available from menu option *Products → Files to download* or see tabs concerning particular devices). The firmware on our website is packed. After downloading the file, the firmware should be unpacked and saved in particular folder on computer hard disk.

> ⚠ Downloading of the configuration program CLM01-CAN Bootloader and
> actual firmware versions for particular devices from **www.quasarelectronics.pl** website
> is available after user free registration

PROGRAMMABLE FUNCTIONS

Programmable functions enable module work configuration according to the user needs.
The programming of the module functions is made with the dedicated configuration software **"CLM01-CAN Bootloader"** working on the PC computer connected to the module through the programming interface **Bootloader USB** with the dedicated cable **Bootloader-W20-CLM02-CAN**.

The description of connection the interface to the PC computer and set up the communication between the module and the PC computer is described in the **Bootloader USB** user manual.

The program **CLM01-Bootloader** functions set up window view is presented below:
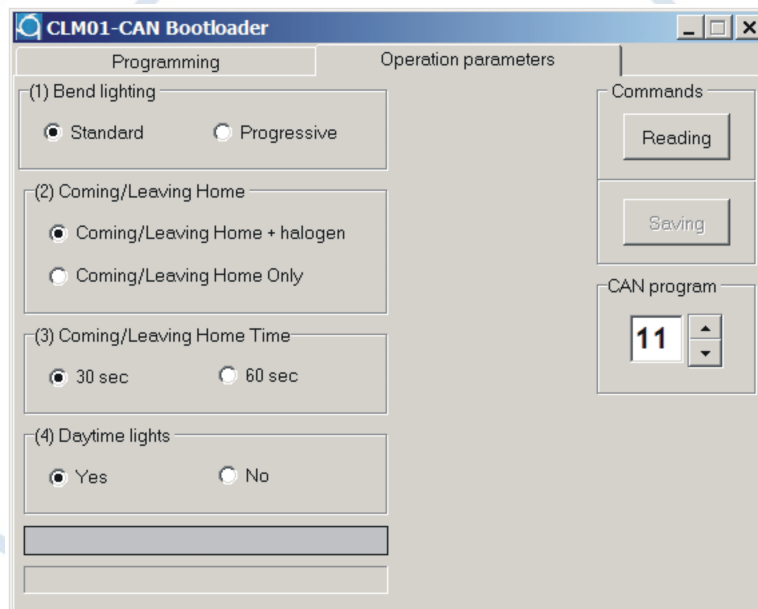
The button **Reading** enables loading of the actual parameters setting. The actual parameters setting can be modified and then stored in the module memory with the button **Saving** (enabled after reading the actual parameters setting).

TECHNICAL DATA

No:	Parameter	Value	Unit	Remarks
1	Nominal power voltage	12	V	8 through 16V
2	Typical current consumption	18	mA	in neutral state
3	Ambient temperature	-40..85	ºC	
4	Max. humidity	60	%	0 through 60%
5	Max. output load:			
	PIN: 14, 16	6	A	
	PIN: 18, 20	5	A	
	PIN: 1, 2	1	A	
6	Supported CAN-bus data rates	33-500	kBit/s	
7	Dimensions	70x83x35	mm	width/depth/height
8	Weight	82	g	Module weight without wiring harness
9	Case proofness index	-	IP-40	

MODULE INPUTS/OUTPUTS DESCRIPTION

No.	Input/output name	Pin number in header	Color of wire	Description
1	Left halogen, input	19	blue	+12V input, left fog headlight control from the car installation side
2	Left halogen, output	20	blue-white	+12V/5A output, control of the left fog headlight from the bulb side
3	Right halogen, input	17	green	+12V input, right fog headlight control from the car installation side
4	Right halogen, output	18	green-black	+12V/5A output, control of the right fog headlight from the bulb side
5	Road light - left lamp, input	15	yellow	+12V input, road light left lamp control from the car installation side
6	Road light - left lamp, output	16	yellow-black	+12V/6A output, control of the road light left lamp from the bulb side
7	Road light - right lamp, input	13	orange	+12V input, right road light lamp control from the car installation side
8	Road light - right lamp, output	14	red-black	+12V/6A output, control of the road light right lamp from the bulb side
9	Coming/Leaving Home	1	white	Output with active +12V/1A. Turning the ignition off after driving with parking lights turned on sets output to +12V for 30 or 60 sec.
10	TX-Boot	3	-	When connected to Bootloader USB acts as TX line
11	+12V PARK	2	brown	Output with active +12V/1A used for controlling the front parking sensors
12	Parking lights (analog input) / RX-Boot	4	violet	+12V input connected to the parking light bulb. The input is used when there is no CAN-bus message with main light status. When connected to the Bootloader USB acts as RX line
13	Handbrake, input	8	gray	Input activated with ground level connected to the handbrake switch
14	"Coming/Leaving Home" function triggering	6	white-black	Input activated with +12V connected to the road lights controlling wire
15	CAN-H	9	orange-green	CAN-bus "High" input
16	CAN-L	10	orange-brown	CAN-bus "Low" input
17	GND	5	black	Module power ground
18	Main power +12V	11	red	+12V/10A. The power supply positive terminal
		12		

THE CLM02-CAN MODULE INSTALLATION SCHEMATIC

RIGHT FRONT FOG LIGHT - INPUT
Connection from controller side
Pin 17 / GREEN

RIGHT FRONT FOG LIGHT - OUTPUT
Connection from bulb side
Pin 18 / GREEN-BLACK

COMING/LEAVING HOME
OUTPUT active with +12V/5A within 30/60 sec after finishing the drive with main lights turned on
Pin 1 / WHITE

+12V PARK
OUTPUT, which is set to +12V/1A, provided for controlling the front park sensor work
Pin 2 / BROWN

PARKING LIGHTS STATUS
INPUT on which appears +12V when the parking ligths are turned on
Pin 4 / VIOLET

RIGHT ROAD LIGHT - INPUT
Connection from controller side
Pin 13 / ORANGE

RIGHT ROAD LIGHT - OUTPUT
Connection from bulb side
Pin 14 / RED-BLACK

HAND BRAKE
Input activated with ground level, when the handbrake is pulled-up the daylights are turned off
Pin 8 / GRAY

Car front fog light right lamp

Road light right lamp

LEFT FRONT FOG LIGHT - INPUT
Connection from controller side
Pin 19 / BLUE

LEFT FRONT FOG LIGHT - OUTPUT
Connection from bulb side
Pin 20 / BLUE-WHITE

POWER SUPPLY
+12V
Pin 11, 12 / RED

GROUND
Pin 5 / BLACK

CAN
CAN-L input
CAN-H input
Pin 10 / ORANGE-BROWN
Pin 9 / ORANGE-GREEN

LEFT ROAD LIGHT - INPUT
Connection from controller side
Pin 15 / YELLOW

LEFT ROAD LIGHT - OUTPUT
Connection from bulb side
Pin 16 / YELLOW-BLACK

COMING/LEAVING HOME - Trigger.
+12V input, triggering the Coming/Leaving Home function (connect to Left or Right Road Light Input)
Pin 6 / WHITE-BLACK

Car front fog light left lamp

Road light left lamp