



GD35C Gear Display

User Manual 1.0



Device

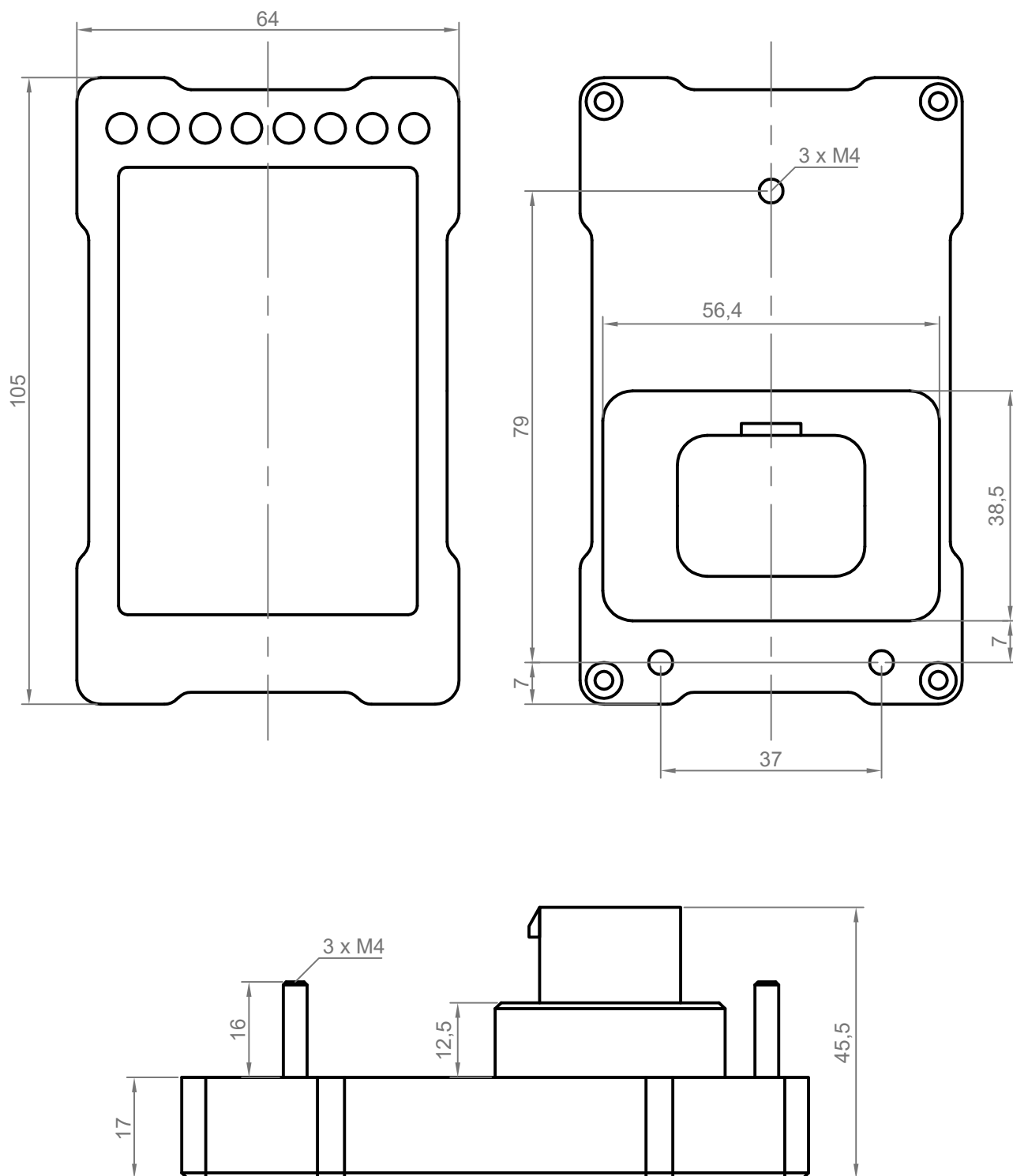
GD35C is a combined display with shift light module to show gears and simple warning information. Device can read all signals from CAN bus or physical inputs.

Features

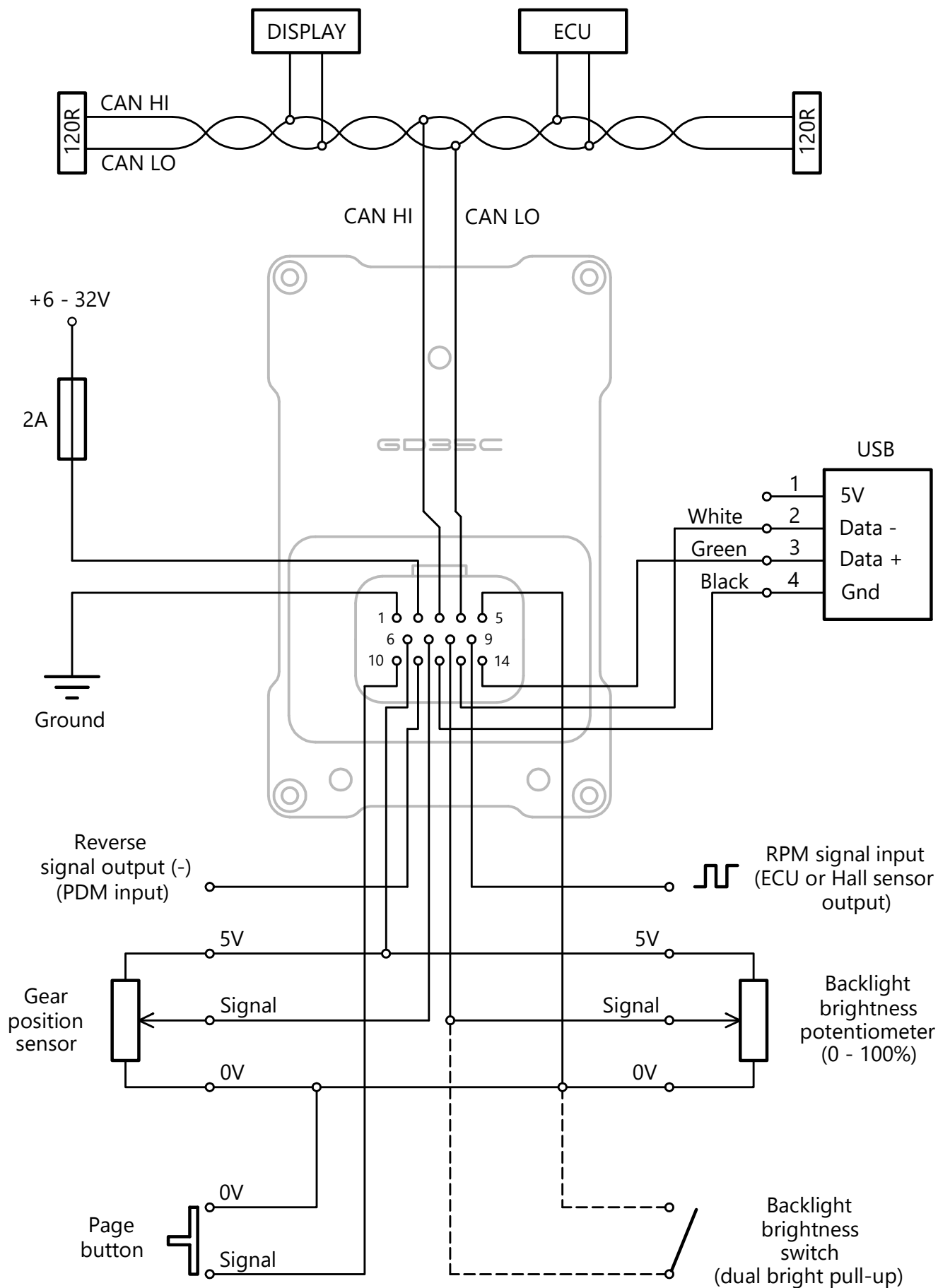
- Color IPS Display 3.5"
- 3 styles of symbols, which change with button (page 1-3). Gears 1-8, R, N, D, P
- 3 color background, which is controlled by RPM or via CAN bus (green/orange/red)
- Simple warnings (power, sensor, gear detection, button)
- 8 color RGB Led shift light module
- Power voltage range 6 - 32V
- 5V power output for sensors
- CAN bus 125/250/500/1000 kbps
- Reverse gear signal output
- USB PC connection
- Windows application to set up/upload/get configuration
- Real time setup

Dimensions

All dimensions in [mm]



Wiring



Software

PC Recommendations

- Windows 10/11
- Screen size minimum 1366x768
- 2 GB RAM
- USB ports

Drivers

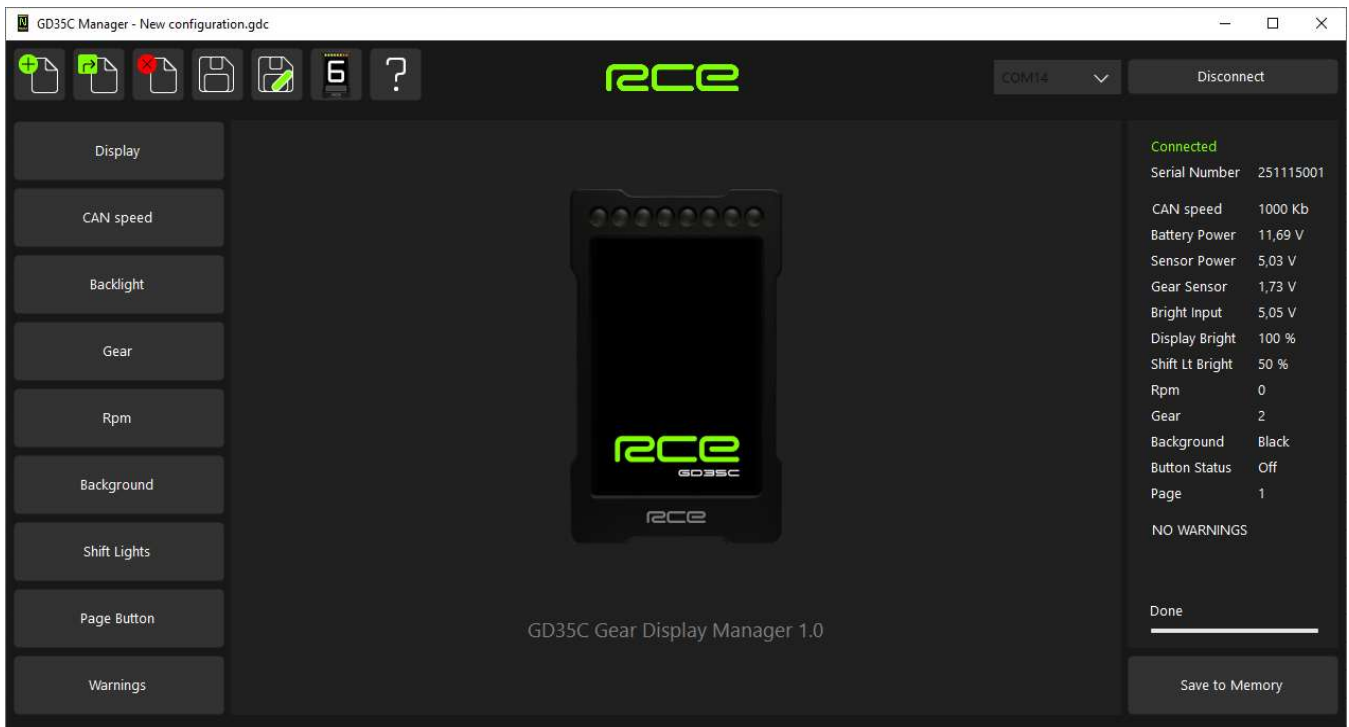
Turn on and connect Device to USB port on your PC. Windows will automatically install suitable driver for device. Otherwise you will have to install driver manually.

For driver installation, please refer to <http://www.ftdichip.com/Documents/InstallGuides.htm>

Gear Display Manager

GD35C Manager software is used to set up, upload to or get configuration from Device.

Software is portable, no need to install, can run from flash disc.



Settings buttons are located on the left side. Press button with desired setting and change parameters.

Note: You can also set parameters when device is disconnected and save configuration on your computer.

Live data is displayed on the right side and available when Device is connected.

By pressing "Save to memory" button, all parameters will be saved from Device's temporary memory to permanent memory.

Configuration

Configuration File

Available options:

- New
- Open
- Close
- Save
- Save as

Connect to Device

Run the software, select device COM Port and click "Connect" button.

After successful connection, configuration from Device will be retrieved.

It is recommended to save configuration backup to PC to avoid loss after setup.

Follow messages with instructions.

Note: When application is connected to GD35C, all parameters are transmitted to Device in real time.

Settings

Display

Click "Display" button. Select one of three pages with different symbols by pressing buttons "Page 1/2/3".

When Device is disconnected, you can preview gears, background color and warnings by pressing "+/-" buttons. In online mode Display will show the same as Device.

When starting up, Device displays startup logo, you can turn it off by pressing button "Start Logo".

CAN speed

Press button with desired CAN speed, then press "Set" button.

Note: Device will restart and configuration will be uploaded to temporary memory.

Backlight

Select brightness source by pressing "CAN" or "Analog input" button.

If "Analog Input" and "0-100%" are selected, brightness level will be directly dependent on analog input voltage (0-5V = 0-100%), use potentiometer.

If selected "Dual", input low level = Brightness 1 value, high level = Brightness 2 value.

You can enter desired Brightness 1/2 values.

Note: if using brightness switch, please select "Pull-up" to connect internal pull-up resistor.

CAN	Analog Input	Pull-up	0 - 100 %	Dual	Brightness 1	80
					Brightness 2	20

When "CAN" and "0-100%" are selected, brightness level will be received by CAN message.

Steps:

- Enter CAN ID in hex.
- Select CAN ID type standard 11 bit or extended 29 Bit.
- Set data length (1 or 2 bytes) and byte position.
- If data length = 2, select format Motorola or Intel by pressing "Swap Bytes"

Unselected = Motorola, selected = Intel.

- If message compound (multiple data channels under a single CAN ID) select "Use Msg ID", set length (1 or 2 bytes) and byte position, then enter message ID in hex.
- Multiply and divide value to get a range from 0 to 100. "CAN value" shows final result.

For example:

- CAN ID 600 hex
- CAN ID type standard 11 bit
- Data length 1
- Data byte position 0
- Data format Motorola
- Using message ID
- Message ID length 2
- Message ID byte position 6
- Message ID AABB hex
- Multiplier 100
- Divider 255

Received data is from 0 to 255, but we need from 0 to 100.

CAN Raw byte 0 = 7D hex (125). $125 \times 100 / 255 = 49$. Brightness = 49%.

Note: On the bottom of Window is real time CAN raw data by entered CAN ID.

The interface is a dark-themed control panel for a CAN bus system. At the top, there are several buttons: "CAN" (highlighted in green), "Analog Input", "Pull-up", "0 - 100 %" (highlighted in green), and "Dual". On the right side, there are two sliders for "Brightness 1" (set to 50) and "Brightness 2" (set to 10). Below these, there are input fields for "CAN ID 0x" (600), "11 Bit" (highlighted in green), and "29 Bit". To the right of these are buttons for "Use Msg ID" (highlighted in green), "Msg ID 0x" (AABB), "Byte pos" (6), and "Lenght" (2). Further right is a "Swap Bytes" button. Below the "CAN ID" section, there are input fields for "Data" (0), "Byte pos" (0), and "Lenght" (1). To the right of these are buttons for "Extract Bits", "Bit pos" (0), and "Bit count" (0). Further right are input fields for "Multiplier" (100) and "Divider" (255). Below these, there is a "CAN value" field showing 49. At the bottom, there is a "Dual control value" field showing 1. At the very bottom, there is a row of buttons for "CAN Raw Data 0x" with values 7D, 00, 00, 00, 00, 00, AA, and BB, each with a corresponding index from 0 to 7.

CAN ID 0x	11 Bit	29 Bit	Use Msg ID	Msg ID 0x	Byte pos	Lenght	Swap Bytes
600				AABB	6	2	

Data	Byte pos	Lenght	Extract Bits	Bit pos	Bit count	Multiplier	Divider
0	0	1		0	0	100	255

CAN value: 49

Dual control value: 1

CAN Raw Data 0x	7D	00	00	00	00	00	AA	BB
	0	1	2	3	4	5	6	7

When "CAN" and "Dual" are selected, Dual control value will be received by CAN message.
 If Dual control value = CAN value, Display brightness = Brightness 2 value, otherwise
 Display brightness = Brightness 1 value.
 You can extract bit or bit field by selecting "Extract Bits", then entering bit count and position.

For example:

- CAN ID 600 hex
- CAN ID type standard 11 bit
- Data length 1
- Data byte position 0
- Data format Motorola
- Using message ID
- Message ID length 2
- Message ID byte position 6
- Message ID AABB hex
- "Extract Bits" selected
- Bit count 1
- Bit position 0
- Multiplier 1
- Divider 1
- Dual control value 1

CAN Raw byte 0 = A1 hex (b'10100001') and we need to extract bit 0 (b'10100001').
 Bit 0 = 1. Display brightness = Brightness 2 value (20%).

The interface is a dark-themed control panel for a CAN bus system. It features several sections for configuration:

- Mode Selection:** At the top, there are buttons for "CAN" (highlighted in red) and "Dual" (also highlighted in red). Other buttons include "Analog Input", "Pull-up", "0 - 100 %", and "Swap Bytes".
- Brightness Settings:** On the right, there are sliders for "Brightness 1" (set to 80) and "Brightness 2" (set to 20).
- CAN Configuration:**
 - CAN ID 0x:** A text input field containing "600".
 - Length:** Two buttons, "11 Bit" (highlighted in red) and "29 Bit".
 - Format:** A button labeled "Use Msg ID" (highlighted in red).
 - Msg ID 0x:** A text input field containing "AABB".
 - Byte pos:** A text input field containing "6".
 - Lenght:** A text input field containing "2".
- Data Configuration:**
 - Data:** A text input field containing "0".
 - Byte pos:** A text input field containing "0".
 - Lenght:** A text input field containing "1".
 - Extract Bits:** A button (highlighted in red) that triggers bit extraction.
 - Bit pos:** A text input field containing "0".
 - Bit count:** A text input field containing "1".
 - Multiplier:** A text input field containing "1".
 - Divider:** A text input field containing "1".
- Output/Status:**
 - CAN value:** A text input field containing "1".
 - Dual control value:** A text input field containing "1".
 - CAN Raw Data 0x:** A row of eight hex digit buttons: "A1", "00", "00", "00", "00", "00", "AA", "BB". Below each button is a corresponding index from 0 to 7.

Gear

Select gear source by pressing "CAN" or "Analog input" button.

If **"Analog Input"**, enter gear voltages and voltage tolerance.

For example:

Gear "1" voltage = 1,10V and tolerance = 0,20V.

Range is from (1,10 - 0,20) to (1,10 + 0,20). From 0,90V to 1,30V.

Note: When sensor voltage is not in one of gears range, gear detection warning (if enabled) will be displayed.

Sensor voltage	2,17										
	R	N	1	2	3	4	5	6	7	8	
Gear voltage	0,40	0,90	1,40	1,80	2,30	2,80	3,20	3,70	4,10	4,60	
Voltage tolerance	0,20										

If **selected "CAN"**, filter gear CAN data as shown in **Backlight** example above.

Enter gear values.

Note: When CAN value does not match any of gear values or CAN message timeout is detected, gear detection warning (if enabled) will be displayed.

CAN value	0												
	R	N	1	2	3	4	5	6	7	8	D	P	
Gear value	9	0	1	2	3	4	5	6	7	8	10	11	

RPM

Select RPM source by pressing "CAN" or "Digital Input" button.

If **"Digital Input"**, enter "Puls per rev". See in live RPM data to match with your Car tachometer.

Enable internal Pull-up resistor if needed.

CAN	Digital Input	Pull-up	Puls per rev	4
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If **selected "CAN"**, filter gear CAN data.

See in live RPM data to match with your Car tachometer.

CAN value	8224	Shift Lt Bright	10 %
		Rpm	8224

Background

Select Background source by pressing "CAN" or "RPM" button.

If selected "RPM", enter desired RPM values in colors for all gears.

When "On RPM" value = 0, this color is disabled.

When "Off RPM" value = 0, off RPM is disabled.

Note: Backgrounds have priorities, Red - high, Orange - medium, Green - low.

CAN

RPM

CAN ID 0x
600

11 Bit

29 Bit

Use Msg ID

Msg ID 0x
0

Byte pos
0

Lenght
1

Swap Bytes

Green Data

Byte pos
0

Lenght
1

Yellow Data

Byte pos
1

Lenght
1

Red Data

Byte pos
2

Lenght
1

Extract Bits

Bit pos
0

Bit count
0

CAN value Green

0

CAN value Yellow

0

CAN value Red

0

Gear 1

On Rpm

Green
3100

Yellow
5100

Red
6100

Off Rpm

Green
4500

Yellow
0

Red
0

Control value

Green
1

Yellow
1

Red
1

If selected "CAN", filter background CAN data.

Enter control values for backgrounds.

Note: When CAN value does not match any of backgrounds control value or CAN message timeout detected, color will be switched to Black.

CAN

RPM

CAN ID 0x
600

11 Bit

29 Bit

Use Msg ID

Msg ID 0x
0

Byte pos
0

Lenght
1

Swap Bytes

Green Data

Byte pos
0

Lenght
1

Yellow Data

Byte pos
1

Lenght
1

Red Data

Byte pos
2

Lenght
1

Extract Bits

Bit pos
0

Bit count
0

CAN value Green

1

CAN value Yellow

1

CAN value Red

1

Gear 1

On Rpm

Green
3100

Yellow
5100

Red
6100

Off Rpm

Green
0

Yellow
0

Red
0

Control value

Green
1

Yellow
1

Red
1

CAN Raw Data 0x

01

01

01

00

00

00

00

00

0

1

2

3

4

5

6

7

Connected

Serial Number

20251115

CAN speed

1000 Kb

Battery Power

11,62 V

Sensor Power

5,05 V

Gear Sensor

2,81 V

Bright Input

3,68 V

Display Bright

73 %

Shift Lt Bright

36 %

Rpm

2994

Gear

4

Background

Red

Button Status

Off

Page

1

NO WARNINGS

Done

Save to Memory

Shift Lights

First configure LED brightness. You can set constant brightness value or control via backlight brightness channel.

For constant brightness, enter desired value to "Brightness % 1".
"Use Backlight" button must be disabled.

The screenshot shows a configuration bar with buttons: CAN, Simple control, RPM (highlighted in green), and Use Backlight. To the right, there are three input fields for 'Brightness %' with values 80, 5, and 10, corresponding to labels 1, 2, and Max respectively.

To control LED brightness via backlight channel, enable "Use Backlight" button.
If backlight control Dual, enter desired values to "Brightness % 1 and 2".
If backlight control 0-100%, enter desired value to "Brightness % Max".

The screenshot shows the same configuration bar as before, but now the 'Use Backlight' button is highlighted in green, indicating it is enabled.

If selected "RPM", enter desired RPM values for all gears and select colors by pressing buttons.

Note: Default RPM values will be applied to R, N, D, P gears.

When "On RPM" value = 0, this light is disabled.

When "Off RPM" value = 0, off RPM is disabled.

The screenshot shows a detailed configuration table for 8 gears. The 'Color' row shows Green for gears 1-3, Yellow for 4-5, Orange for 6-7, and Red for 8. The 'On Rpm' row shows values from 3050 to 6550. The 'Off Rpm' row shows all zeros. The 'Red blink Rpm' is set to 7100.

	1	2	3	4	5	6	7	8
Color	Green	Green	Green	Yellow	Yellow	Orange	Orange	Red
Control value	1	1	1	1	1	1	1	1
On Rpm	3050	3550	4050	4550	5050	5550	6050	6550
Off Rpm	0	0	0	0	0	0	0	0

If selected "CAN", Shift lights can be controlled by filtered CAN data or predefined protocol.

Control modes:

- Simple control (led number control via CAN and manual select colors).
- Color control (led number and colors controlled via CAN).
- MoTeC ECU (M400, M600, M800, M1)
- MoTeC Display address 1
- MoTeC Display address 2

Select mode by pressing button.

The screenshot shows the configuration bar with 'CAN' highlighted in green. Below it, there are buttons for 'MoTeC Display A1', 'RPM', and 'Use Backlight'. Further down, there are input fields for 'CAN ID 0x' (7FF), '11 Bit', '29 Bit', 'Use Msg ID', 'Msg ID 0x' (AA), 'Byte pos' (0), and 'Lenght' (1).

Simple control. Filter Shift light CAN data. Enter control values and select colors by pressing buttons.

CAN

Simple control

RPM

Use Backlight

Brightness %

18020Max10

CAN ID 0x

750

11 Bit29 Bit

Use Msg ID

Msg ID 0x

0

Byte pos

0

Lenght

1

Byte pos

Extract Bits

Bit pos

Bit count

Light 1 Data

0

Light 2 Data

1

Light 3 Data

2

Light 4 Data

3

Light 5 Data

4

Light 6 Data

5

Light 7 Data

6

Light 8 Data

7

Light 1 CAN value

1

Light 2 CAN value

1

Light 3 CAN value

1

Light 4 CAN value

1

Light 5 CAN value

1

Light 6 CAN value

1

Light 7 CAN value

1

Light 8 CAN value

1

Gear 1

Color

12345678

GreenGreenGreenYellowYellowOrangeOrangeRed

Control value

11111111

Red blink Rpm

On Rpm

30503550405045505050555060506550

Off Rpm

000000000

7100

CAN Raw Data 0x

0101010101010101

01234567

Color control. Filter Shift light CAN data.

Light X CAN value:

0 = Off, 1 = Red, 2 = Orange, 3 = Yellow, 4 = Green, 5 = Blue, 6 = Cyan, 7 = Magenta, 8 = White

CAN

Color control

RPM

Use Backlight

Brightness %

18020Max10

CAN ID 0x

750

11 Bit29 Bit

Use Msg ID

Msg ID 0x

0

Byte pos

0

Lenght

1

Byte pos

Extract Bits

Bit pos

Bit count

Light 1 Data

0

Light 2 Data

1

Light 3 Data

2

Light 4 Data

3

Light 5 Data

4

Light 6 Data

5

Light 7 Data

6

Light 8 Data

7

Light 1 CAN value

4

Light 2 CAN value

4

Light 3 CAN value

3

Light 4 CAN value

3

Light 5 CAN value

2

Light 6 CAN value

2

Light 7 CAN value

8

Light 8 CAN value

8

Gear 1

Color

12345678

GreenGreenGreenYellowYellowOrangeOrangeRed

Control value

11111111

Red blink Rpm

On Rpm

30503550405045505050555060506550

Off Rpm

000000000

7100

CAN Raw Data 0x

0404030302020808

01234567

Note: When Light CAN value does not match with light Control value or CAN message timeout detected, LED will be switched off.

Page Button

Select Button source by pressing "CAN" or "Digital Input" button.

If **"Digital Input"**, pages will be controlled by physical input.

If **selected "CAN"**, filter Page Button CAN data. Enter control value.

When Can value = Control value, button status = On. Otherwise button status = Off.

Note: When CAN message timeout detected, button holds previous value.

If button pressed for more than 2 seconds, selected page will be saved in Device memory.

If button pressed for more than 6 seconds, malfunction warning (if enabled) will be displayed.

Warnings

Device has several simple warnings:

- Power voltage Hi/Lo
- Sensor error Hi/Lo
- Sensor power voltage Hi/Lo
- Gear detection
- Button malfunction

Warning voltage levels can be entered for power supply and sensor.

All warnings can be switched off.

Power	Voltage Lo 7,00	Voltage Hi 17,00
Sensor	Voltage Lo 0,10	Voltage Hi 4,90
Sensor power		
Gear detection		
Button		

Specifications

Display

- 3.5 inch, 320*480 pixels resolution, IPS TFT LCD, wide viewing angle
- Brightness 300 nit

Communications

- CAN bus 125/250/500/1000 kbps
- USB PC connection

Power Supply

- Operating voltage 6 to 32 volt DC
- Operating current 0.28A maximum at 12 volt
- Reverse Battery protection

Sensor Supply

- 5V Sensor supply 0.15A maximum
- 0V Sensor supply 0.5A maximum

Inputs

- Brightness analog input 0 to 5.38V, switch mode, configurable internal pull-up 10K to 5V
- Gear position analog input 0 to 5.38V
- RPM digital input from ECU or Hall sensor 0 to 12V maximum, configurable internal pull-up 10K to 5V
- Button digital input, internal pull-up 10K to 5V

Outputs

- Reverse gear signal output 0V 0.5A maximum

Operating Temperature

- Ambient temperature range in free air -10 to 50 °C

Note: not tested, based on used parts specification

Physical

- Housing: 3D printed resin (SLA)
- Size: 64.0 x 105.0 x 45.5 mm
- Weight 145 g
- 14 pin waterproof connector