Installation and Configuration Instructions for Optolevel® GateWay Level Surveillance System Automation Peripherals

(Download the latest configuration software from our website before proceeding)

Contents

NOTICE! **When configurating Optolevel® Gateway, CAN-bus CANH/CANL-signals should be terminated with 120 Ω – 6 kΩ resistor.**

NOTICE! **FROM SERIAL NUMBER 1932 ONWARDS**
Gateway is not equipped with METAX-feature anymore.
Contact Optolevel® if you need to purchase units with METAX-feature.

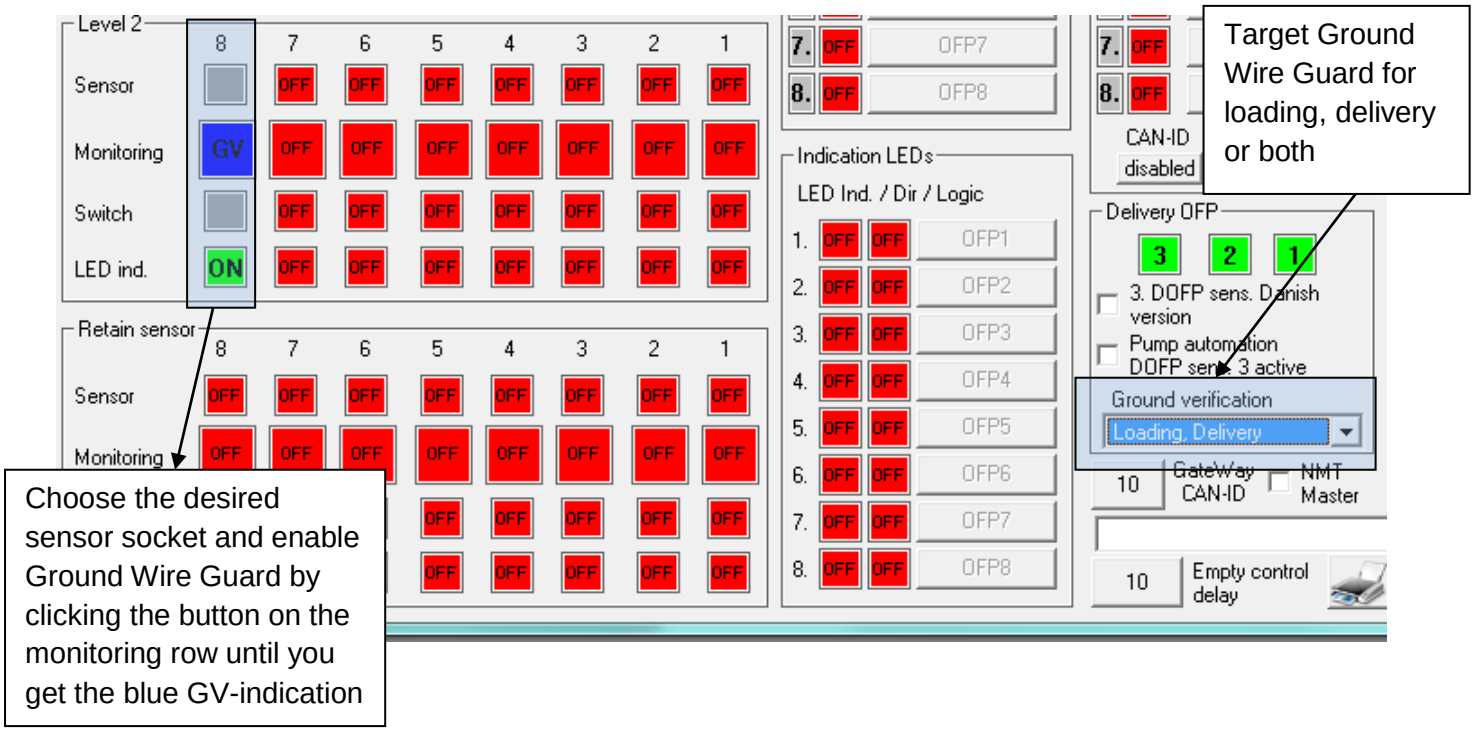
1. Ground Wire Guard (from version 10.4.6.3 onwards)

Functional description

If the connection to ground on Interlock B has more than 120 Ω resistance, then the delivery (and loading) connectors become non-permissive. In GateWay version 10.4.7.3 or later the Ground Wire Guard can be bypassed by holding the reset button down for 10s. When the Ground Wire Guard is bypassed the Interlock B-LED starts blinking.

Configuration

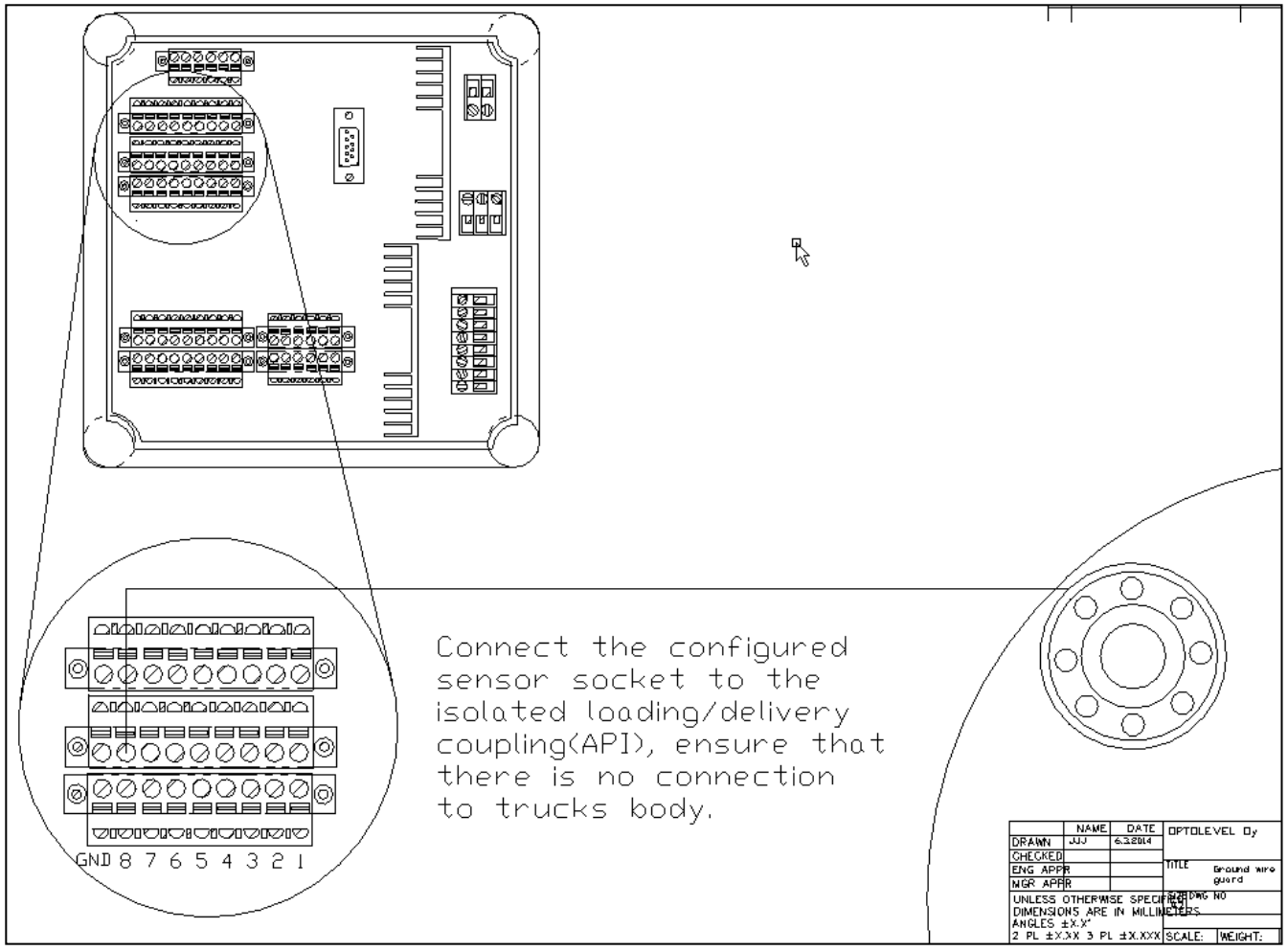
Ground wire guard needs to be enabled in the configuration. Guard can be enabled for delivery process or for both delivery and loading process. In Picture 1.1 the correct configuration values are presented for the guard wire.



Picture 1.1 Ground Wire Guard Configurations

Connection

When the Ground Wire Guard is enabled, it needs external connections for the selected sensor socket to work properly. The configured sensor socket connection needs to be connected to the isolated delivery/loading hose/arm connection (usually API). So it can detect if the grounding can be found from the other end of the coupling (Picture 1.2).



Picture 1.2 Connection diagram for the Ground Wire Guard.

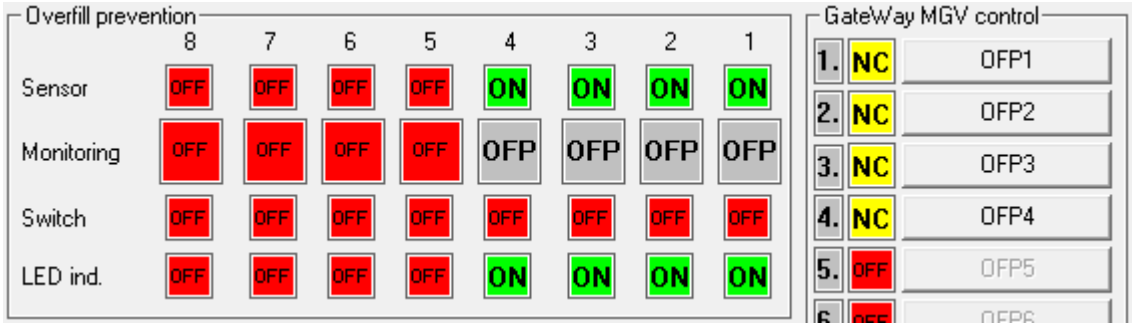
2. Load transfer

Functional description

Load transfer is used to transfer the goods from the trailer to the towing vehicle. GateWay does not need a separate signal in order to do this; it is enough as long as the solenoid valve controls are configured correctly. Solenoid valve control reacts when a top sensor of a compartment gets wet. Utilizing these controls a tank truck pneumatics / logic manages the load transfer start and stop.

Configuration

In the Picture 2.1 shows an example for load transfer configuration.



Picture 2.1 Load transfer configuration.

Connection

Instructions for solenoid valve connections are found from installation pictures. In order to carry out load transfer also pneumatics are needed to manage the start and stop.

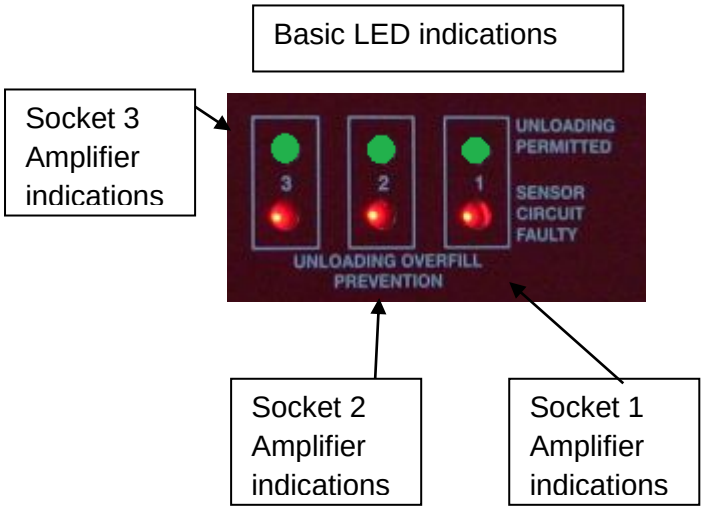
3. Delivery Overfill Prevention

Functional description

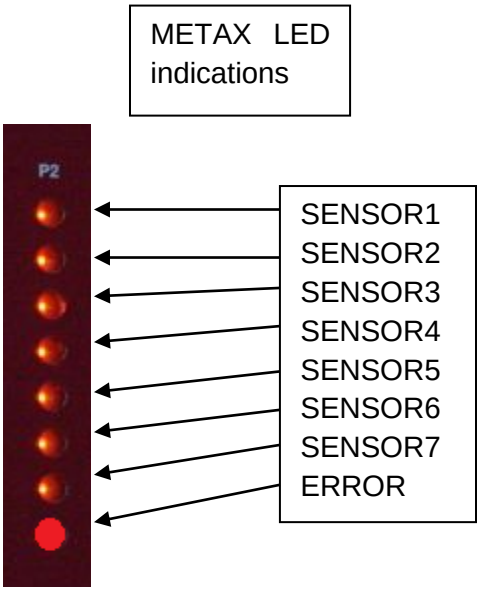
In GateWay 10, there are three OFP sensors sockets (Picture 3.1). One of these sockets can be configured to work as Danish METAX system (

Table 3.2). When the METAX function is used, the P2-LEDs are overwritten by METAX and used to indicate its status (Picture 3.2). Each OFP socket has a red and a green led to indicate different types of situations (

Table 3.*1*). (NOTE! METAX function is only available from GateWay 10.4 or later).



Picture 3.1 LED indications, OFP sensor sockets.



Picture 3.2 Metax LED.

Table 3.1 Normal Overfill Prevention.

Basic LEDs			Explanation of the indication
RED	GREEN		
off	off	→	Socket turned off.
on	on	→	Permission from bypass socket, safety features OFF
off	on	→	Permission from sensor, safety features active
blinking	off	→	Connection open or short circuit
on	blinking	→	Sensor is warming up

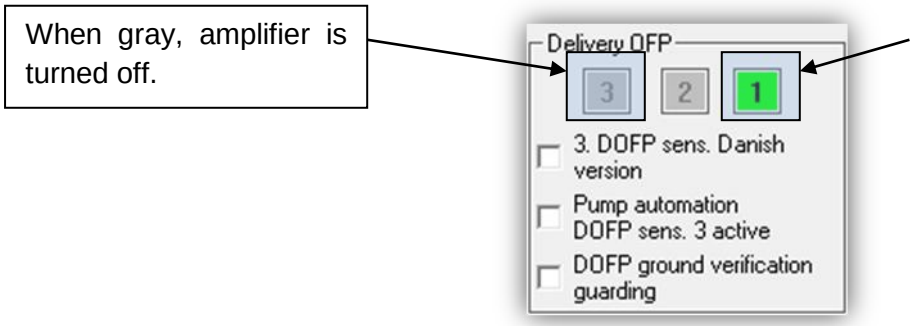
all blinking fast	all blinking fast	→	Voltage is too low for system to work reliably

Table 3.2 Danish Overfill Prevention (METAX).

LEDs				Explanation of the indication	
RED	GREEN	ORANGE	ERROR		
off	off	off	off	→	Socket turned off
blinking	off	off	off	→	Connection open
off	off	blinking	off	→	Sensor warming
fast blinking	off	blinking	off	→	Sensor warming, but voltage is getting too low to function.
fast blinking	on	off	off	→	Permission from station unit, (received one or more voltage is getting low signals), safety features active
off	on	off	off	→	Permission from sensors, safety features active
on	on	off	off	→	Permission from bypass socket, safety features **OFF**
off	off	on	on	→	Station unit informed error on the sensor
off	on	blinking fast	blinking fast	→	Sensor error masked, permission from sensors, safety features on excluding the masked sensor
off	on	blinking fast	off	→	Wet sensor masked and permission on, safety features on excluding the masked wet sensor
off	off	on	off	→	Sensor wet. Can be masked with short reset
all blinking	all blinking	off	off	→	METAX socket has a short circuit, remove short circuit and press long reset to recover
all blinking fast	all blinking fast	off	off	→	Voltage is too low for system to work reliably

Normal Configuration

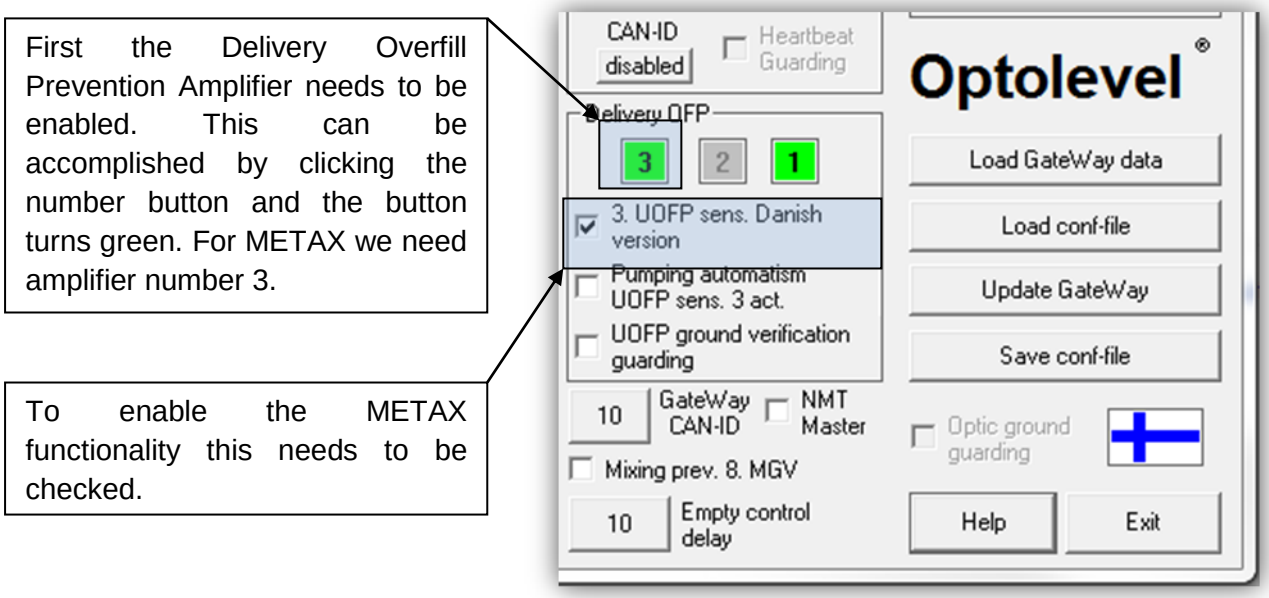
Used amplifier needs to be enabled. This can be accomplished by clicking the number button and the button turns green.



Picture 3.3 Normal Configuration **-** Delivery Overfill prevention Amplifier.

METAX Configuration

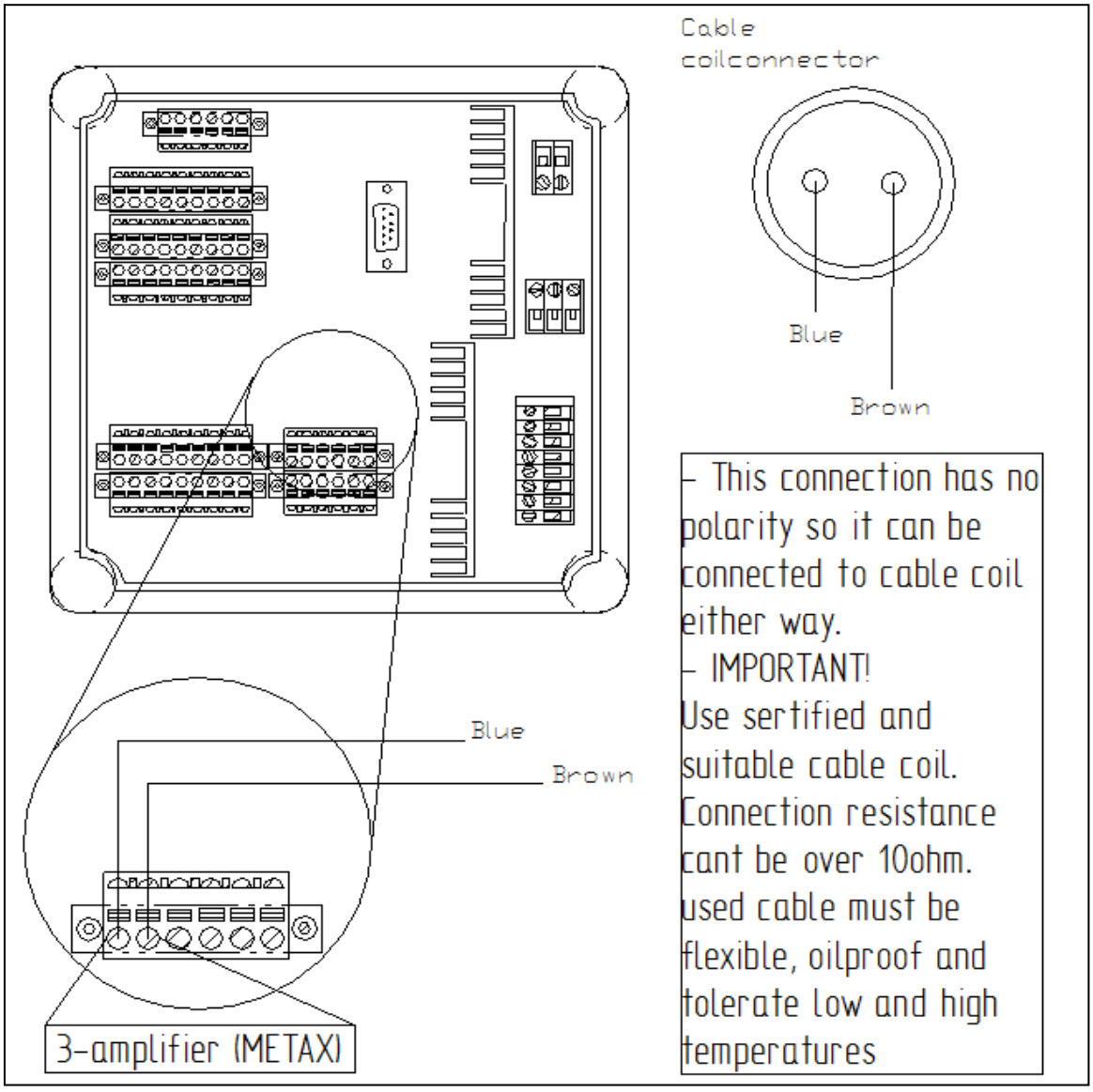
Used Delivery Overfill Amplifiers (Picture 3.3) and METAX-function needs to be enabled trough configuration before they can be used. Picture 3.4 shows the options for the METAX-function in the configuration software.



Picture 3.4 METAX Configuration.

Connection

The connection for the METAX-delivery amplifier is the same as the normal delivery amplifier when the amplifier connection 3 is the enabled METAX terminal. METAX Cable Coil connector needs to be of another color than the normal amplifier connector, and it should include a warning that it is not allowed to be used with the normal amplifier socket. Needed connections are demonstrated in Picture 3.5.



Picture 3.5. METAX Connection.

4. Pump Automation (from version 10.3 onwards)

Functional description

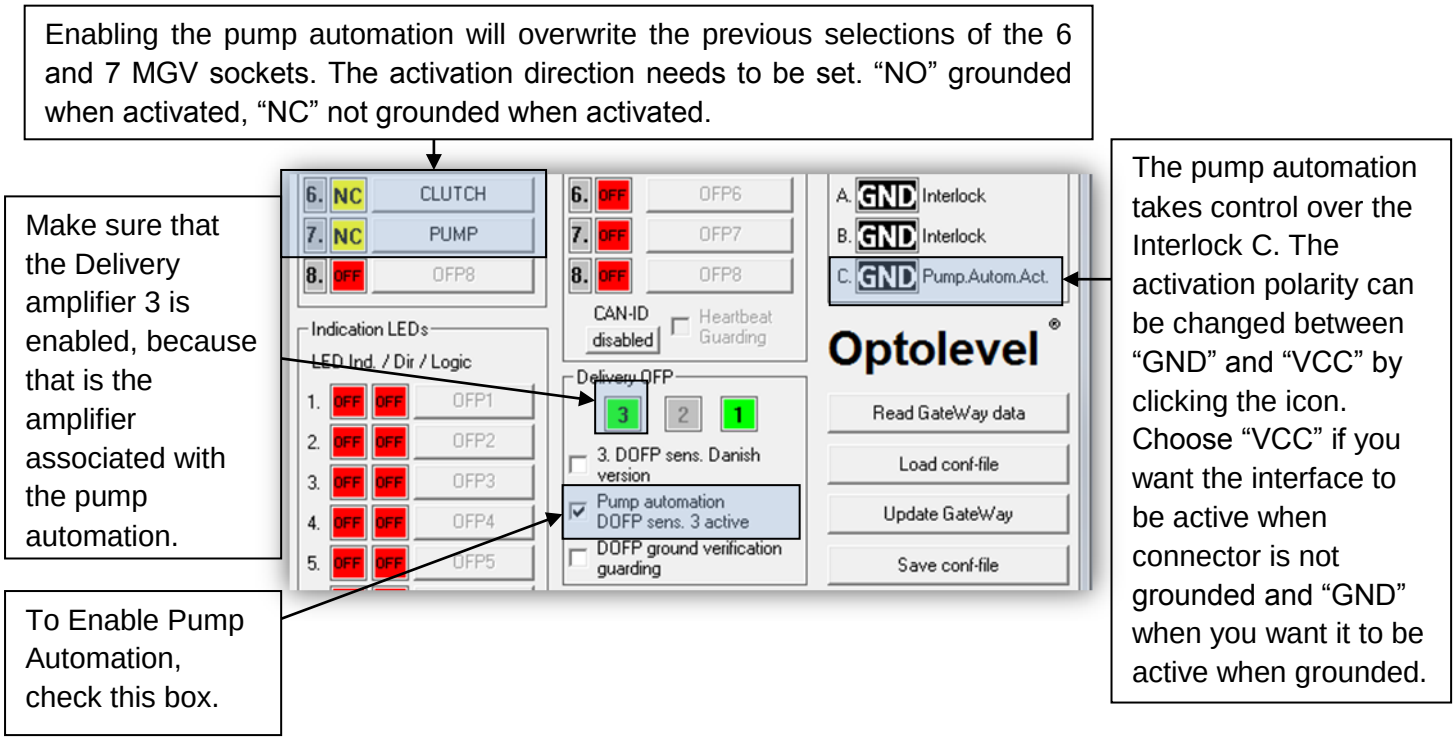
The Pump automation needs two conditions to be active in order to start. Interlock C needs to be active and permission from the third delivery amplifier socket is also needed. After that, the automation is activated. The automation process is explained below:

Interlock C active and Delivery amplifier 3 is permissive → MGV6 output is enabled → 5s delay → MGV7 output is enabled → 2s delay → MGV6 output is disabled → Waiting for the Interlock C to

deactivate or Delivery amplifier 3 to become non-permissive → MGV6 output is enabled → 5s delay → MGV7 is disabled → 2s delay → MGV6 is disabled → pump automation has ended.

Configuration

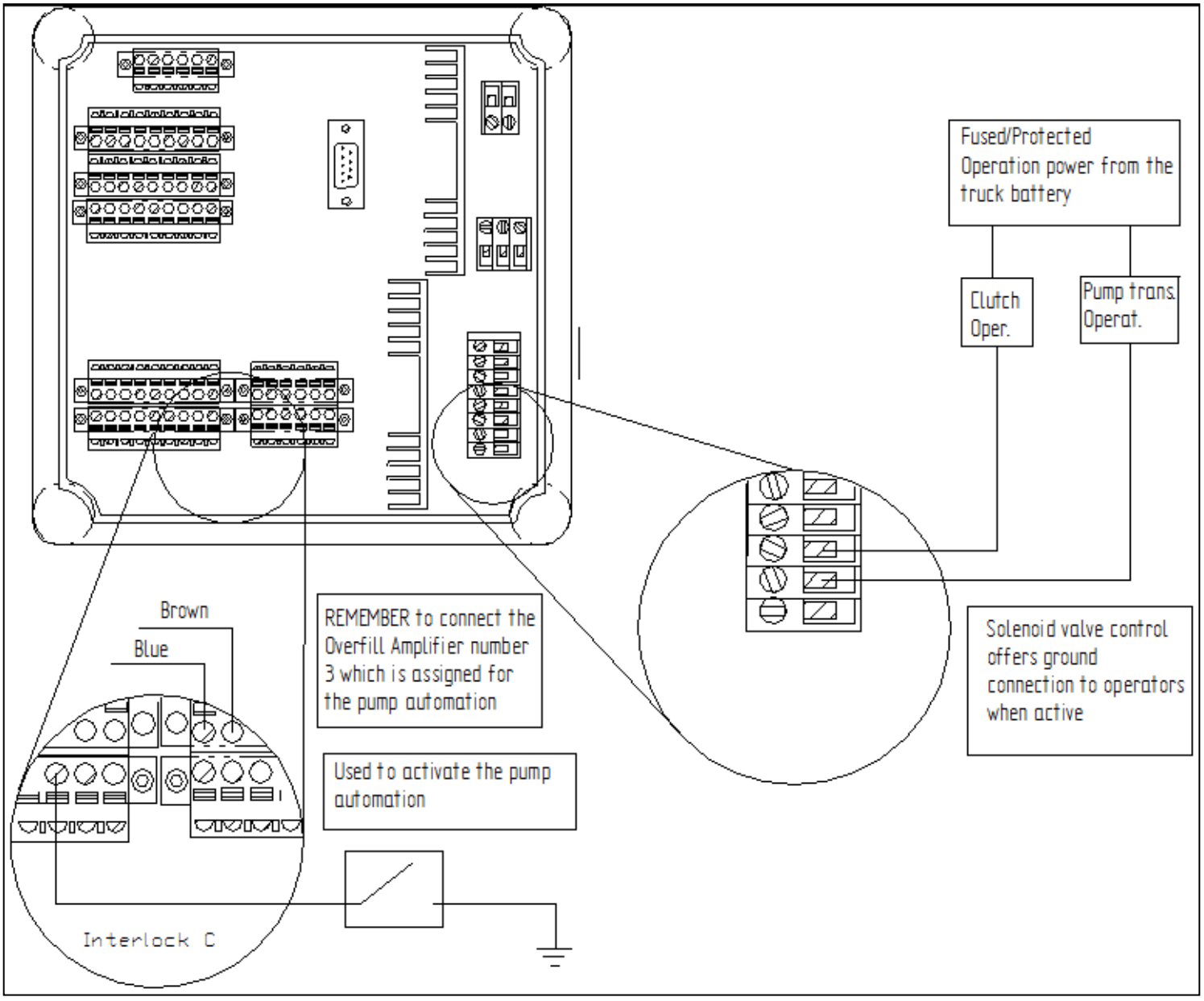
Pump automation needs to be enabled in the configuration software in the following way (Picture 4.1).



Picture 4.1 Pump automation configuration.

Connection

The connections for the pump automation is shown in Picture 4.2, remember that this is only one way to do this. So read the functional description and think what is your solution. Pump automation controls two functions in the system, clutch operator and the transmission operator to pump.



Picture 4.2 Pump automation connection

5. Delay logic/Pipe drain automation (from version 10.4.8.1 onwards)

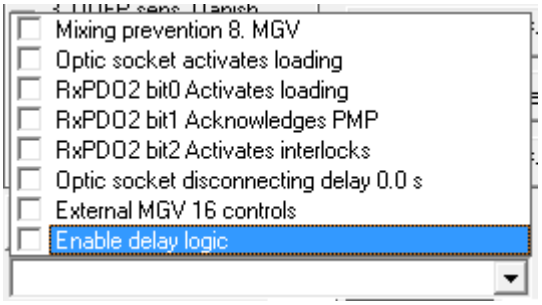
Functional description

With delay logic, for example, pipe drain automation and other delay based sequences can be implemented. When activated, 1st control turns active and stays on defined time. After delay is expired, control turns off and next is activated and so on. After last (6th) control delay, all controls are then off. All controls turn off if activating input is disabled during operation. Delay logic states can be used

normally on control logic equations. These are listed as “Delay logic state x”, where x indicates position.

Configuration

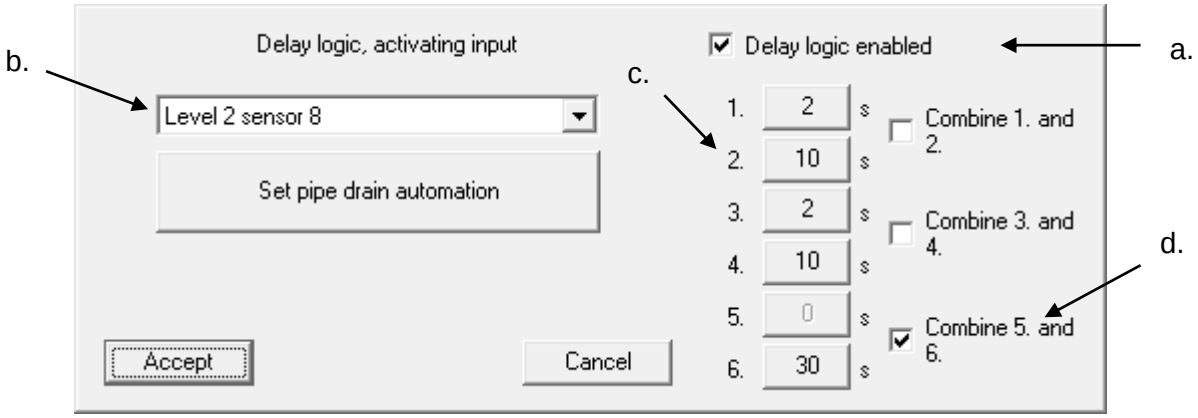
Delay logic is configured to use from extra options combo box and then selecting “Enable delay logic”, see Picture 5.1.



Picture 5.1 Delay logic selection

When selected, delay logic settings window opens (Picture 5.2): (a) feature activated, (b) activating input, (c) control delay length 0 – 15s, (d) combining two controls/delays can be used for longer delay 0 – 255s.

From “Set pipe drain automation” – button can be set informative basic delays and activation from P2-8 switch input. When accepted, program sets control positions 6 and 7 for delay logic use.



Picture 5.2 Delay logic settings window

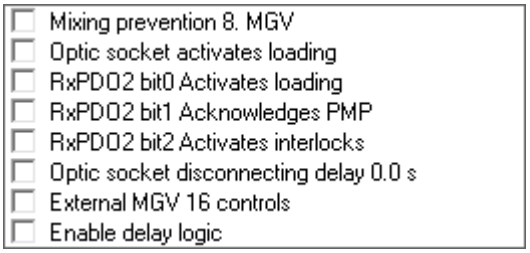
When dialog settings are accepted, view changes at combo box as in Picture 5.3.

Picture 5.3 View on extra options combo box when enabled

Selection displays activating input following with configured delays in order.

6. Additional options list

Available options listed in Picture 6.1.



Picture 6.1. Additional options combo box

- Mixing prevention 8. MGV
  - 8. magnetic valve is set for mixing prevention use
- Optic socket activates loading
  - When optic socket is connected and GateWay receives input pulses, loading activates
- RxPDO2 bit0 Activates loading
  - CAN-bus control bit actives loading on GateWay
- RxPDO2 bit1 Acknowledges PMP
  - CAN-bus control bit change 0 →1 → 0 acknowledges product mixing prevention
- RxPDO2 bit2 Activates interlocks
  - CAN-bus control bit activates interlocks on GateWay
- Optic socket disconnecting delay
  - When optic socket is disconnected, connected signal is kept configured time
- External MGV 16 controls
  - Look Chapter 13.
- Enable delay logic
  - Look Chapter 5.

7. Overfill Prevention (OFP)

Functional description

When sensor which is assigned to Overfill Prevention monitoring gets wet, the overfill prevention makes loading connections (optic socket and thermal socket) non-permissive and after the control delay, it enables the solenoid valve which was assigned to said sensor (Picture 7.2).

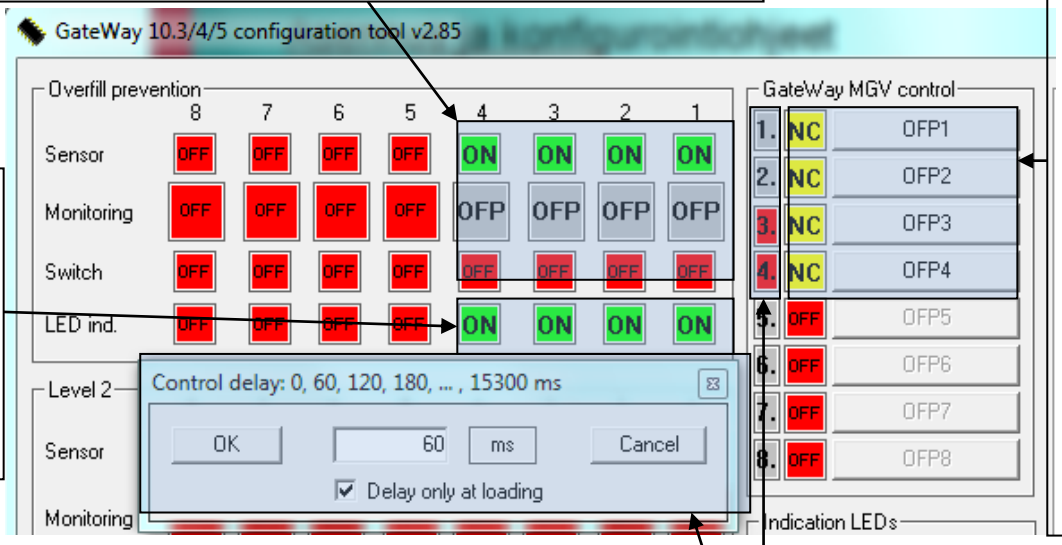
Configuration

In the configuration, the sensors and switches need to be assigned for the overfill prevention automation. If the solenoid valve connections are used, they need to be enabled and assigned to sensors/functions. In Picture 7.1 is one example how to do this.

Enable used sensor sockets and assign “Monitoring”-function to “OFP” (OverFill Prevention). You can also use switch here if needed, change to switch by clicking the button on the “Switch” row.

Turn on the wanted Solenoid valve controls and assign them to the OFPx sensors with the two buttons provided. The active state for solenoid valve needs to be selected first before it can be assigned to any function “NC” or “NO”.

You can enable or disable the LED-indication by clicking the button on “LED ind.”-row. Default is “ON”.

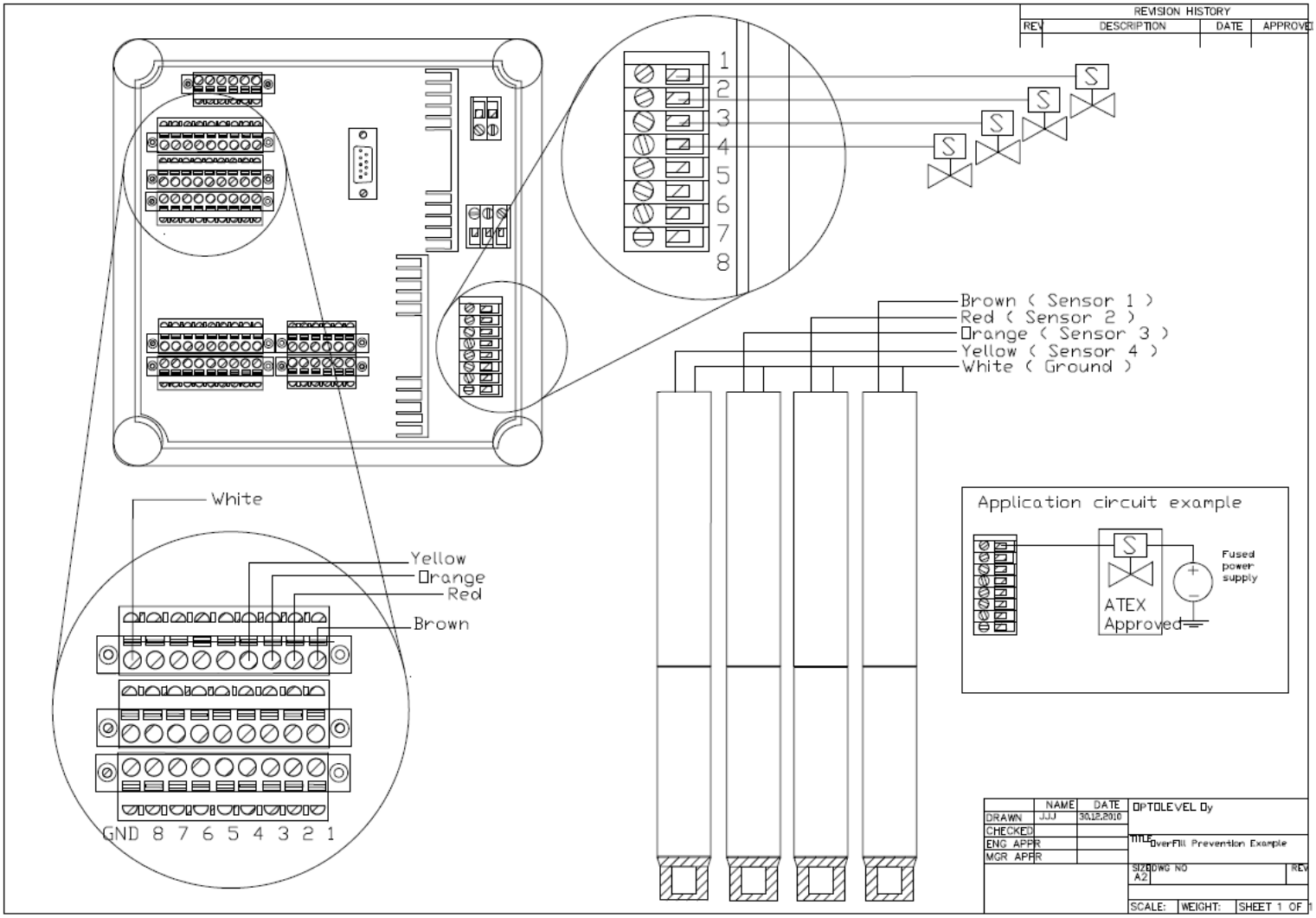


(NOTE! ONLY in GateWay 10.4.7.4 or later) When the Solenoid valve is assigned to OFP use it can be given a control delay from 0 to 15300ms. You can assign the control delay by clicking the Solenoid valve number and typing the delay value in the appearing input window. If the MGV has control delay set the surrounding area of its assigning number turns to yellow.

NOTE! In GateWay 10.4.7.9/10.5.7.9 or later there is possibility to assign delay for the magnetic valve to any function or logic. You also have a choice to select if the delay is active always(yellow) or only in the loading(red).

Picture 7.1 Overfill Prevention configuration example

Connection



Picture 7.2 Connection example for the Overfill Prevention

8. SPBI Control (from version 10.4.7.8 onwards)

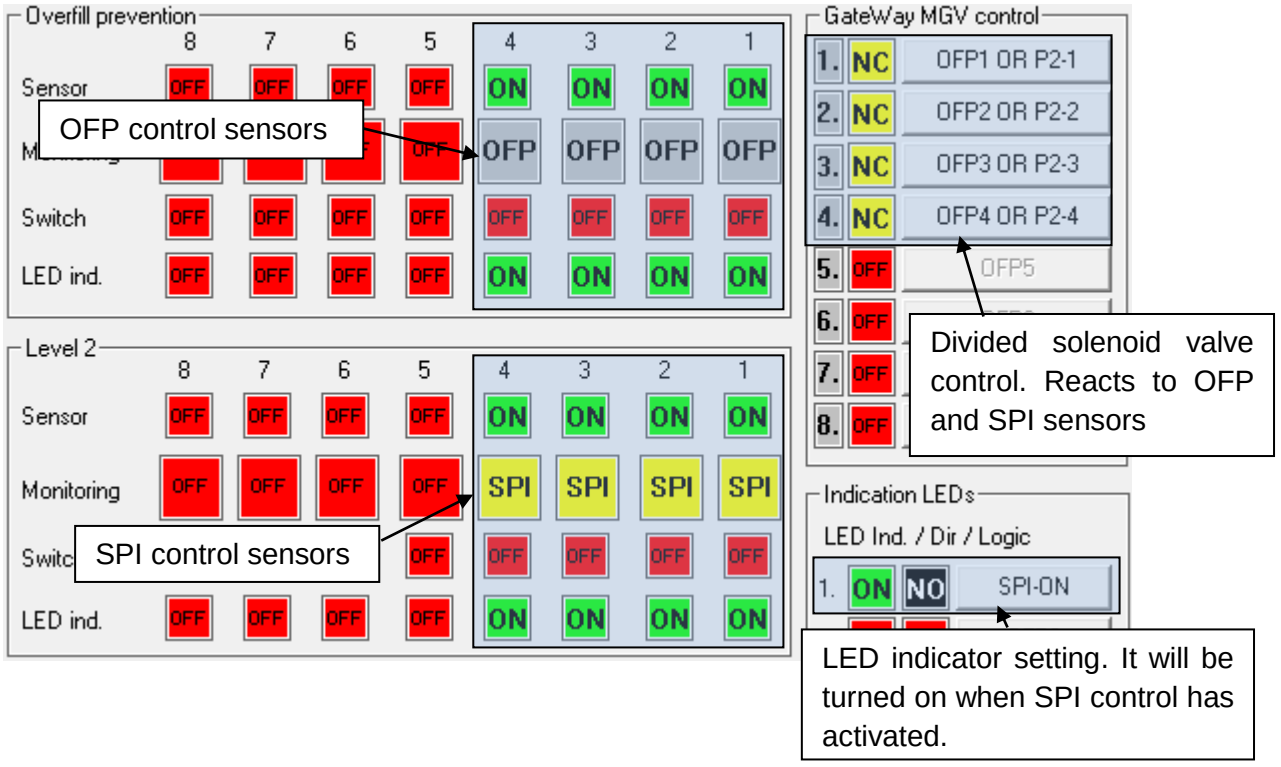
Functional description

SPI control is based on the Swedish standard in which the loading is carried out to the safety device, in other words, the compartment is filled until the sensor gets wet. Loading is started by activating the loading. When the liquid level reaches the sensor, the loading becomes non-permissive and the loading is interrupted. After this, the user must acknowledge the situation with the acknowledgment button, the compartment bottom will close and the loading will continue on the same principle, until all compartments are fully loaded.

Configuration

Control can be chosen OFP and P2 levels. In Picture 8.1, there is presented four-compartment configuration. Solenoid valve controls have been divided with OFP OR-operation. The indicator of the SPBI control activation can be defined as a logical operation. Note that for each SPBI sensor location must be found the solenoid valve control, otherwise the configuration will fail!

Note! SPBI = SPI



Picture 8.1SPI control configuration

Connection

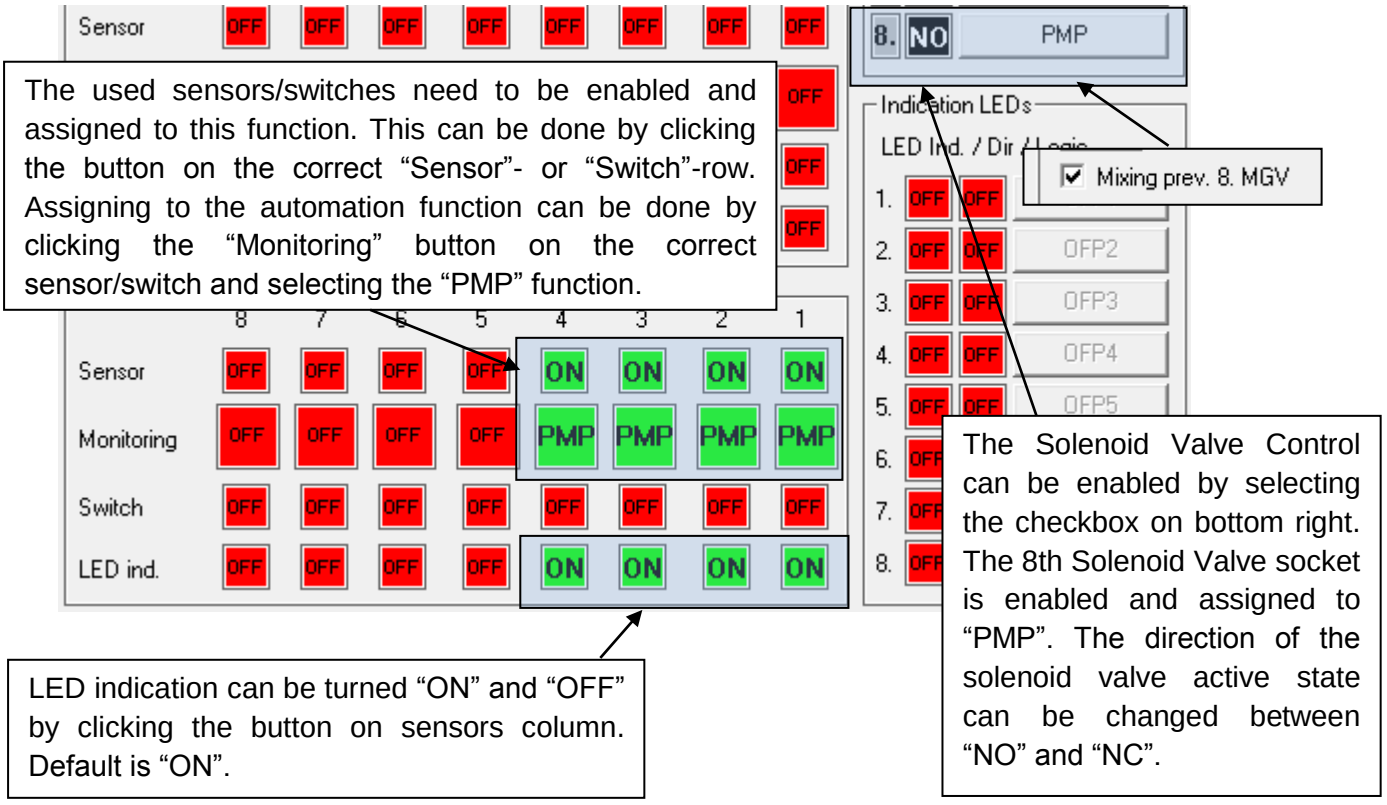
Connection examples for sensors in Picture 7.2, loading connection in Picture 9.2, note also the P2-level sensors. They must be installed to the wanted filling height of the compartment.

9. Product Mixing Prevention/Retain overfill prevention (PMP)

Functional description

When loading connection is activated the GateWay unit begins to inspect the assigned sensor/switches. If the sensors/switches get wet/activated the product mixing prevention is enabled, this is indicated with red LED, and the loading connections become non-permissive. If the solenoid valve is configured to use it then it will be enabled. The prevention can be bypassed by pressing acknowledgement, after that the loading connections return to normal status, the Solenoid valve is disabled and the Product mixing prevention LED starts to blink (will last as long as the function is active).

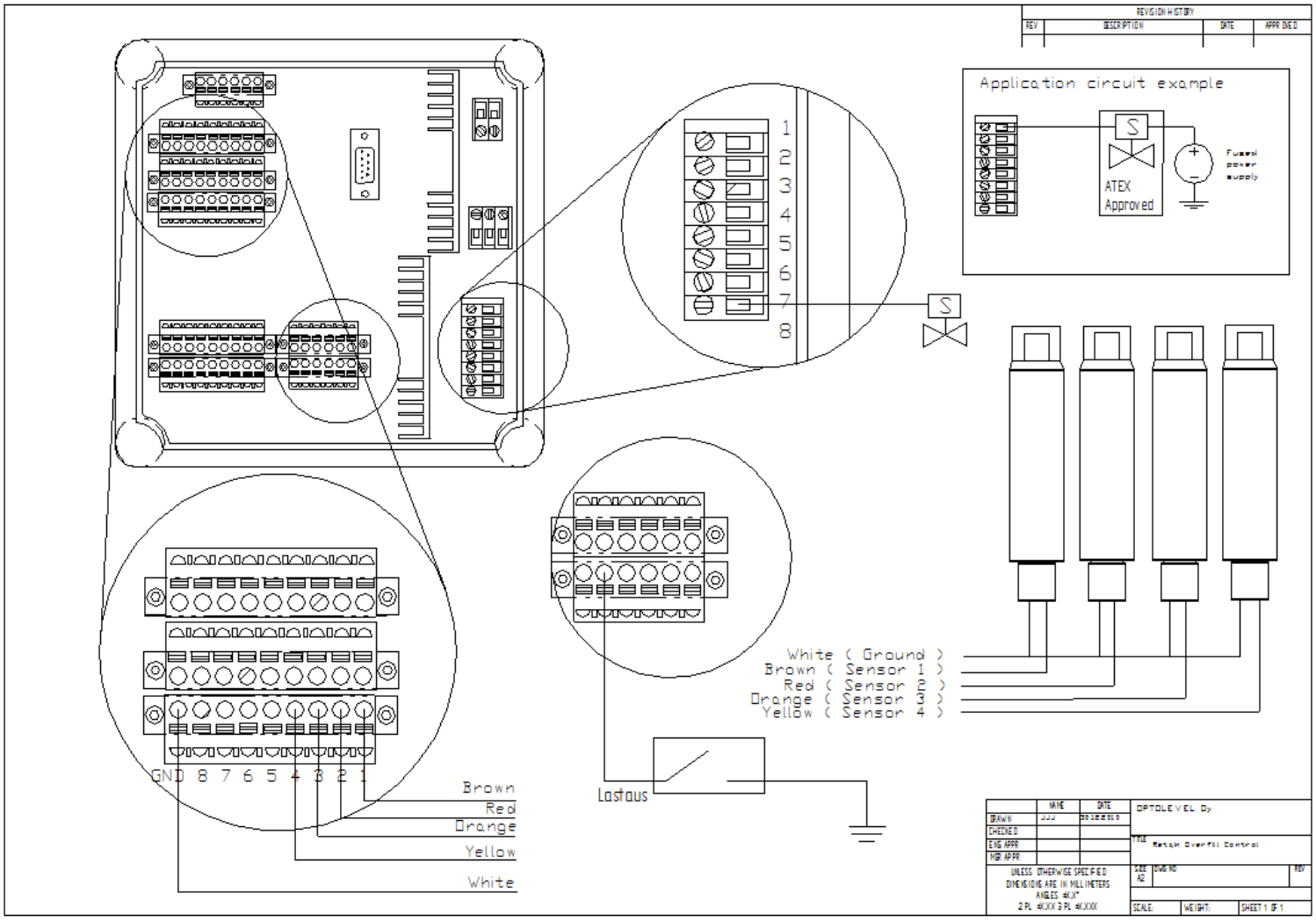
Configuration



Picture 9.1 Product Mixing Prevention configuration example.

Connection

The configured retain sensors need to be connected. Connection of the optic sensors is presented in Picture 9.1. Also if the Solenoid valve is used it needs to be connected and the example can be found from Picture 9.2.



Picture 9.2 Product Mixing Prevention Example.

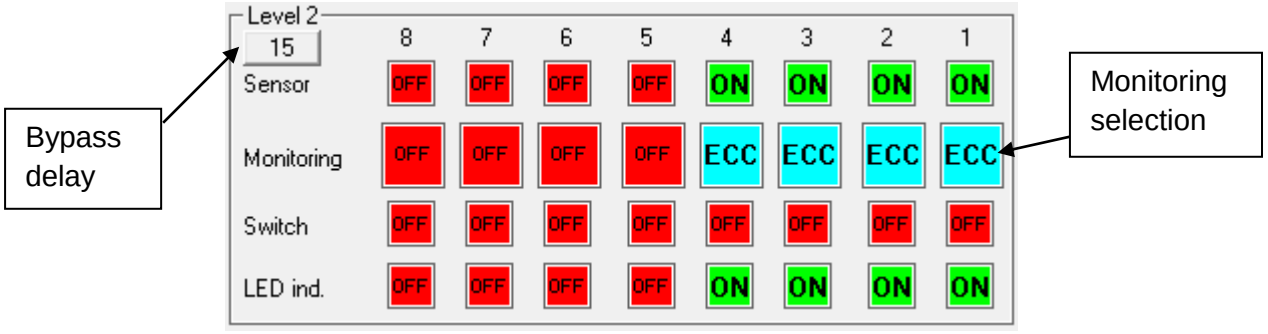
10. EEC Empty Compartment Control (from version 10.4.7.7 onwards)

Functional description

Empty compartment control is used to prevent loading if there is too much previous liquid left in the container. It monitors the sensors during the product mixing prevention control time, and they should stay dry within this period. If the sensors are still wet after delay or activation of EEC, loading permission is denied. To continue loading, these sensors must be dry, compartments have to be emptied. When the sensor becomes dry, loading permissions is then available. After this procedure, the function is not activating anymore. If there is some kind of interruption of the procedure, loading permissions can be bypassed by holding the acknowledge button down the configured time.

Configuration

Control can be assigned to level 2 and BOTTOM level; the indication is EEC (Picture 10.1). When this is selected, a button with a number appears upper left corner on the level 2 sensor group window. Here acknowledgement time can be set, the minimum time is 15 s to prevent accidental and routine bypassing.



Picture 10.1 Retain overfill control enhancement configuration.

Connection

Look Picture 9.2. Note the correct level of sensors.

11. MGV-controls

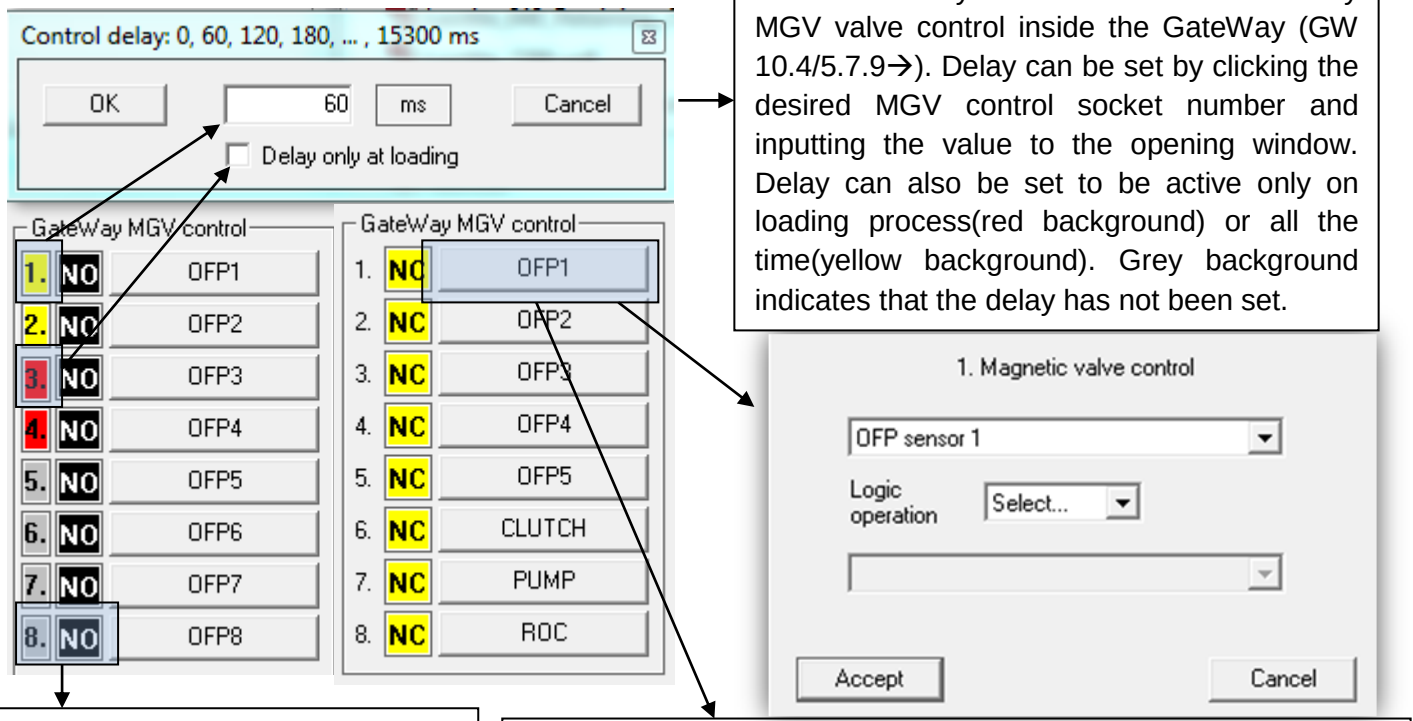
Functional description

When the assigned function activates the Solenoid valve is enabled. If the configuration for the valve is “NC” the normal state is grounded and if the configuration is “NO” the normal state is open. Closed means that through the solenoid valve terminal is ground provided by the connected operator. Open means that no ground connection is provided by the connected operator.

NO= Normal Open = Disabled
NC = Normal Closed = Disabled

Configuration

The MGV-controls A.K.A Solenoid valve controls are the outputs of the Optolevel® GateWay system. There are 8 normal direct Solenoid Valve controls that can be assigned to desired sensors/switches/functions (Picture 11.1). There are also 3 dedicated Solenoid valve controls for the Delivery Overfill Amplifier use. These cannot be configured to different use. Also in GateWay 10.3 or later there are eight extra controls through data connections, but they need external components (This is introduced and explained in the following paragraph).



Activation delay can now be set for every MGV valve control inside the GateWay (GW 10.4/5.7.9→). Delay can be set by clicking the desired MGV control socket number and inputting the value to the opening window. Delay can also be set to be active only on loading process(red background) or all the time(yellow background). Grey background indicates that the delay has not been set.

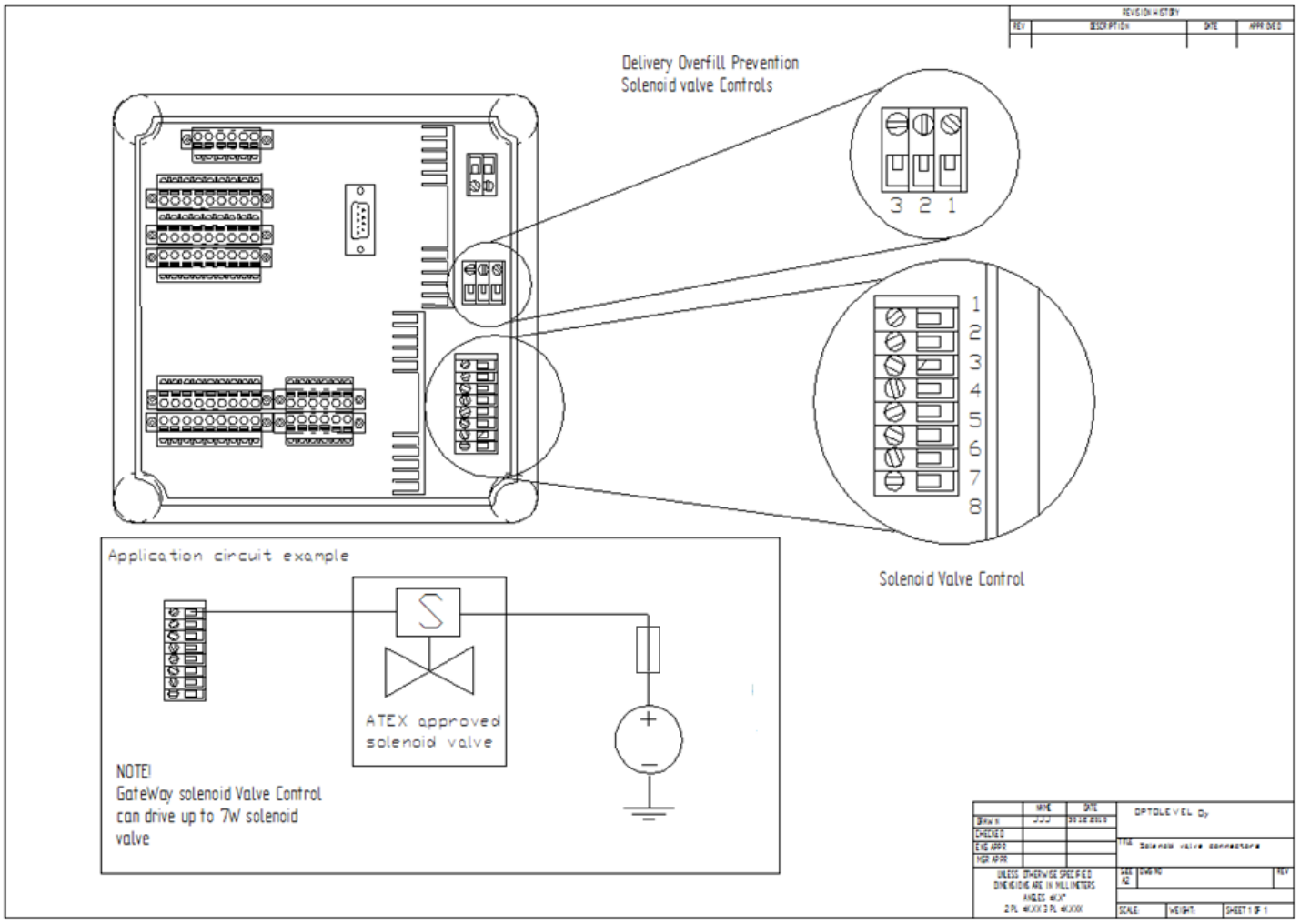
The Solenoid valve control can be enabled by clicking this button, when button is pushed it will enable and show the status which it will have if active. “NO” means Normal Open, so in active state the socket is grounded. “NC” means Normal Closed, so in normal state the terminal is grounded and in active state it is open.

The activating function or logical operations of activating functions can be enabled by clicking this button. From the drop down menus select the desired sensors/functions and logical operations. When selected statement becomes active/true the solenoid valve is enabled.

Picture 11.1 Solenoid Valve Control configuration

Connection

GateWay solenoid valve terminals are grounding connections, which mean that they are not capable supplying solenoid valves in any manner (Picture 11.2).



Picture 11.2 Solenoid Valve Control Connection

12. External CAN-MGV pack control (from version 10.3 onwards)

Functional description

There are three possible variations on how to configure the CAN-MGV control:

Topology 1: The GateWay sends the CANopen frame to the CAN-pack with a time interval 100ms. The CAN solenoid pack initialization needs to be handled by the network master. If the CAN-connection is disconnected suddenly the latest state will stay in effect in the solenoid valve.

Topology 2: No heartbeat guarding: At the startup, the GateWay will briefly act as a network master and initialize the CAN solenoid valve pack. After initialization, the GateWay starts sending CANopen frames to the CAN-pack with a time interval of 100ms. If the CAN-connection is disconnected suddenly the latest state will stay in effect at the solenoid valve.

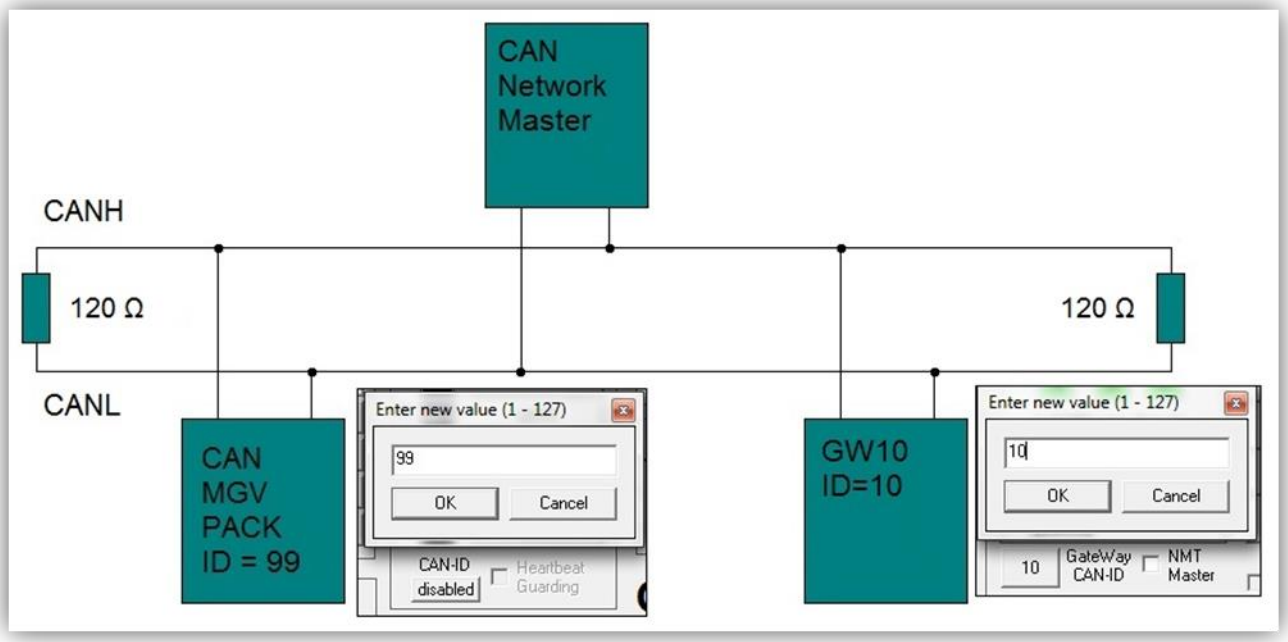
Topology 3: Heartbeat guarding: At the startup, the GateWay will send initializing commands to the CAN solenoid valve pack and begin sending heartbeat frame with 200ms interval with an ID1. Also, it will start sending CANopen frames to control the valve pack with an interval of 100ms. If the CAN-connection is disconnected and the CAN solenoid valve pack does not receive the heartbeat in time, the solenoid valve pack will reset and close all its connections.

When the assigned function activates realizes as true (logic 1) the Solenoid valve is enabled and the enabled state is send to External CAN-MGV-pack through CAN-bus. If the configuration for the valve is “NC” the enabled state is 0 so in the CAN-MGV-pack this means closed and if the configuration is “NO” the enabled state is 1 and in the CAN-MGV-pack this means open.

Otherwise the solenoid valve control works as the normal solenoid valve connection on the GateWay

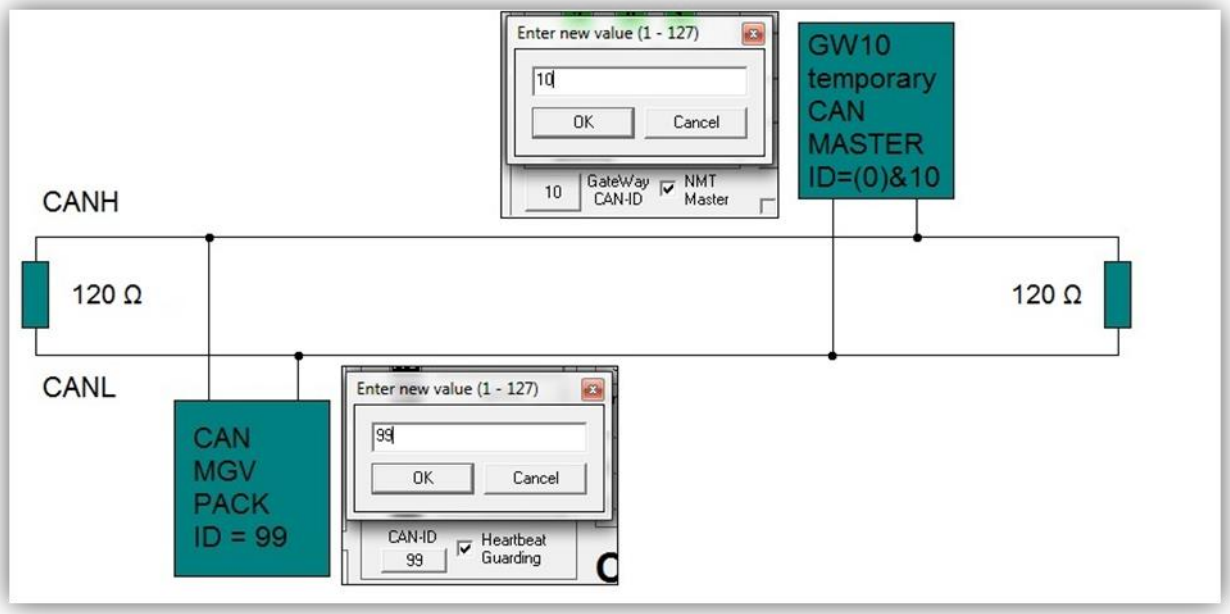
Configuration

For the external solenoid valve pack uses the CAN-bus needs to available. The CAN-Solenoid pack can be used in few different ways and these have to be configured for the GateWay-unit. First, the CAN-bus ID for the GateWay 10 and the used CAN-bus Solenoid Valve Pack needs to be set. The GateWay unit supports currently only CAN baudrate 125Kb/s, so the plans to implement the GateWay in existing design should be made that in mind. There are two different network topology options on GateWay unit. These possibilities are presented in following Picture 12.1 and Picture 12.2.



Picture 12.1 Topology 1: Separate Network Master.

Topology 1 is normally used when the Solenoid pack and the GateWay unit is connected to existing CAN-network. In this case, the Network master needs to send initialization messages to the CAN-pack, so it reacts to the messages coming from the GateWay.



Picture 12.2 Topology 2: GateWay 10 acting as partial Network Master.

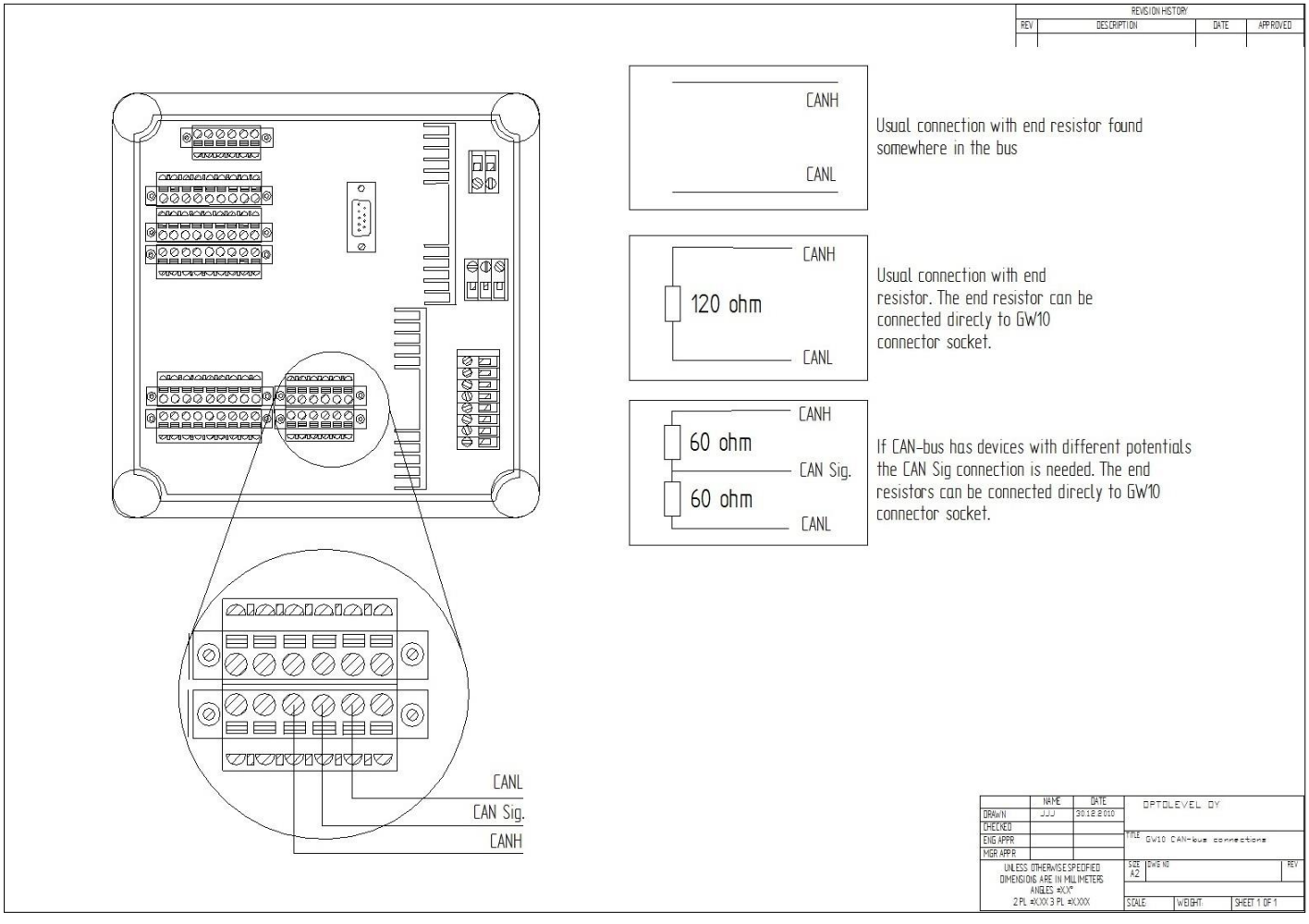
When using topology 2 the configuration should be as shown in Picture 12.2. In this topology, the GateWay will handle the initialization for the CAN Solenoid valve pack and separate initialization is not needed. The CAN solenoid valve pack needs to be preconfigured with correct ID and CAN-baud rate 125kb/s, because auto baud search won't work with only two devices on the bus.

NOTE! When the "Heartbeat Guarding" is used the direction for the solenoid valve controls should be configured to "NO". This is a safe way because if the CAN connection is interrupted then the solenoid valve controls will be closed.

The CAN-control is designed according to CANopen standard, but it is only tested with Nordgren CAN-solenoid valve pack.

Connection

The Picture 12.3 shows how to connect the GateWay to existing CAN-bus and also how to create one.



Picture 12.3 GateWay CAN-bus connection example.

13. External 16. MGV control (from version 10.4.8.1 onwards)

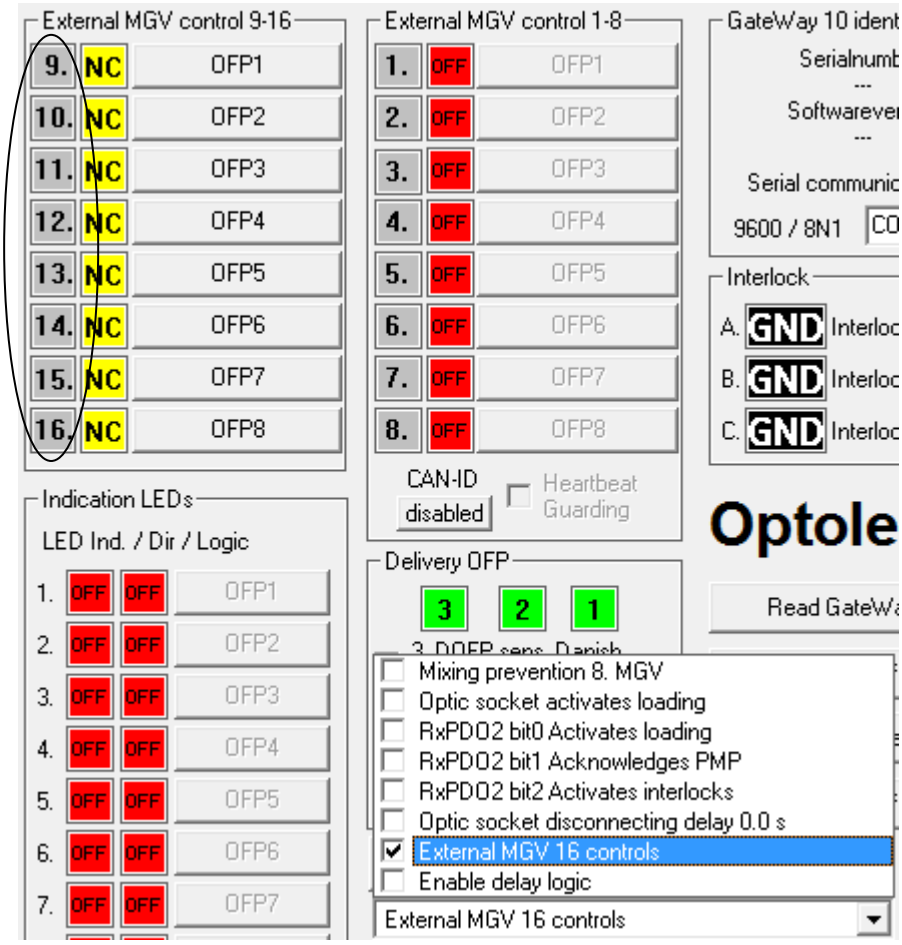
Functional description

This feature allows the use of 16 external magnetic valve controls. GateWay internal magnetic valve controls work normally although header text and numbers change.

Configuration

The feature is activated from extra options combo box as selection “External MGV 16 controls”.

When activated, control boxes text headers and numbers are changed to corresponded external control names, as in Picture 13.1.



Picture 13.1 External 16 MGV controls feature activated.

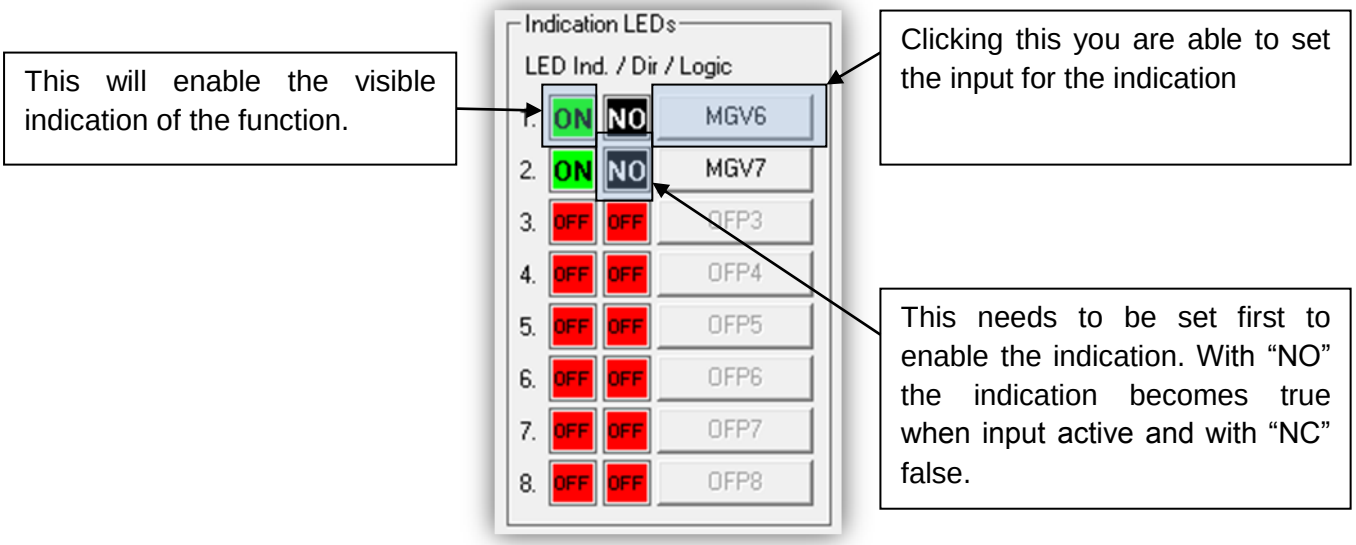
14. LED-Control

Functional Description

When the assigned sensor/switch/function becomes active the LED indication is enabled. Enabled corresponds true when configured as “NO”(LED is lit) and false when configured as “NC”(LED is turned off). When used as aid function the “NC” works as logic function “NOT”.

Configuration

There are 8 LED indications that can be configured to different uses Picture 14.1. When the LEDs are configured to alternative uses, for example, METAX, these functions can be used as a support function to own automation purposes (see chapter 9).



Picture 14.1 LED-control Configuration.

Connection

There are no external connections to be made.

15. Logical Functions

Functional Description

When the assigned (logical) function is realized true the function which it was assigned to will be enabled. The help for the active state (logic 1) realization is presented here in Table 15.1.

Table 15.1 Logical Functions.

Socket	Active State
Optic Sensor	Wet, short circuit, open
Switch NO	Grounded
Switch NC	Open
LED Logic NO	When statement true
LED Logic NC	When statement false
MGV (output) NO	Grounded
MGV (output) NC	Open
Interlock VCC	Open
Interlock GND	Grounded
Other functions	Active when function activated

The truth table (

Table 15.2) for the available logical functions to help to understand the examples:

Table 15.2 Examples of logical functions.

Input 1	Input 2	Result with AND	Result with OR
1	1	1	1
1	0	0	1
0	1	0	1
0	0	0	0

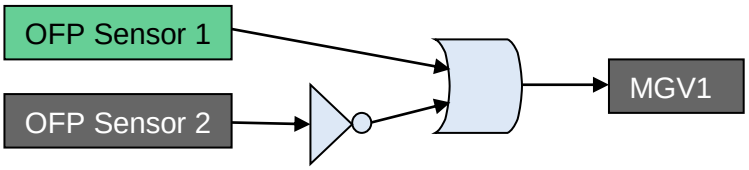
Configuration

The configuration of these functions depends on entirely of what you want to accomplish, so this is explained with two examples in the following pages. In the first example, the basic functions are just used, so there is not that much digital logic knowledge needed.

Example 1 (basic)

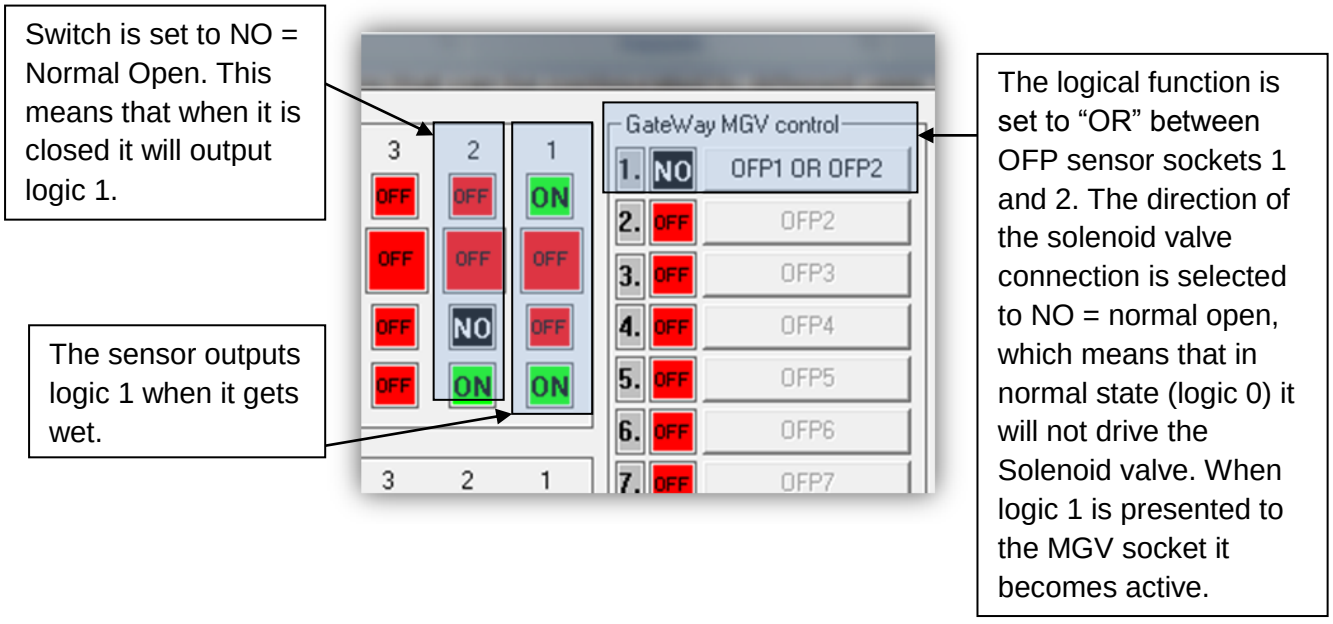
In this example, the solenoid valve will be driven, when the sensor is wet or the switch is closed. Picture 15.1 and Picture 15.2 show the logic function and the configuration, respectively.

The logic workflow:



Picture 15.1 Logic Functions Example 1 Block diagram.

Configuration and explanation:



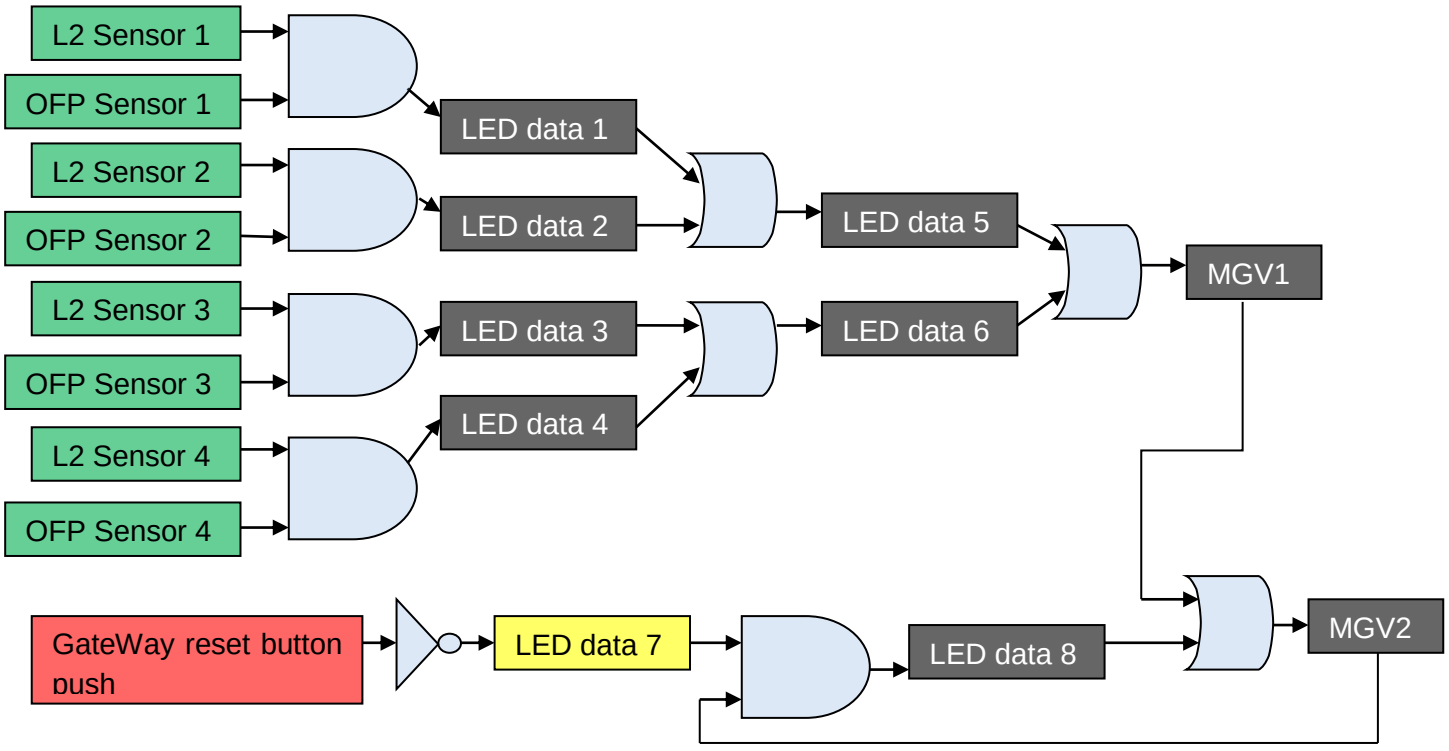
Picture 15.2 Logic Functions Example 1 Configuration

Example 2 (Advanced)

In this example, a double security overfill prevention withhold circuit will be created, which is released by GateWay reset button or turning off the power. To create this, level 2 and OFP sensors, LED data, MGV1 and MGV2 will be used. Picture 15.3 and Picture 15.4 show the logic function diagram and the configuration, respectively.

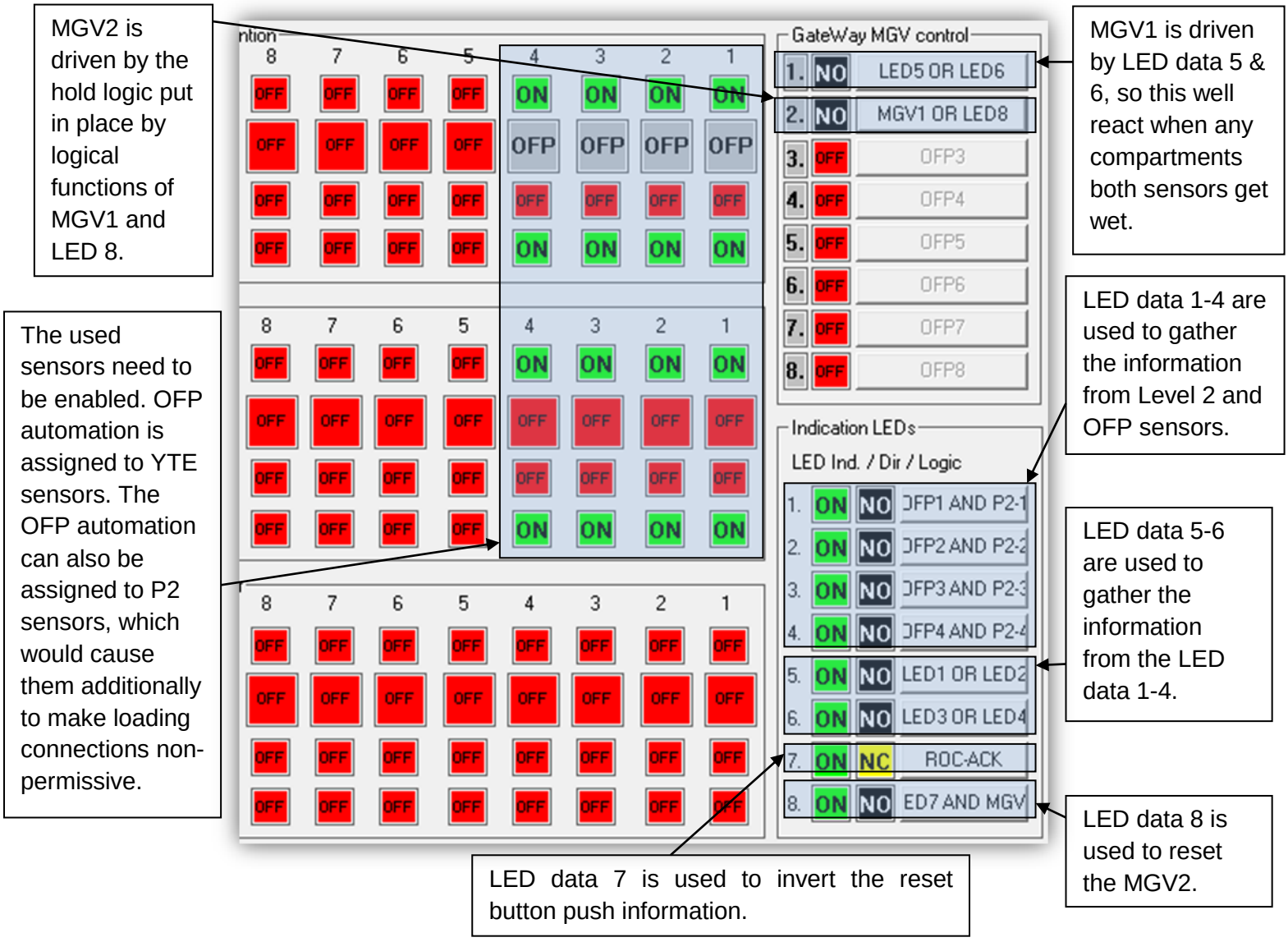
When OFP Sensor of the compartment gets wet the overfill prevention reacts and renders the optical and thermal connections non-permissive. If in the same compartment both OFP and Level 2 sensors get wet then the MGV1 activates. The activation of MGV1 will activate the MGV2 which will hold its state until the reset button is pushed.

The logic workflow:



Picture 15.3 Logic Functions Example 2 Block diagram

Configuration and explanation:



Picture 15.4 Logic Functions Example 2 Configuration.

16. CAN-bus control over GateWay internal MGV (from version 10.4.7.5 onwards)

Functional Description

It is possible to control GateWay's internal Solenoid valve sockets from CAN-bus by another device. The framework is provided in the GateWay CAN framework description.

When the GateWay starts its CAN-bus is in preoperational state accordance with CANopen standard. To start driving the Solenoid valve sockets GateWay needs to be put to the operational state. This is explained in CANopen Standard and one way is to enable the whole CAN-bus (this can only be done by CAN-bus MASTER) by sending a message:

ID	Length	Data[0]	Data[1]
0	2	0x01	0x00

Picture 16.1 Sending Message.

Enabling only GateWay, can be done by sending the same message with ID field assigned:

ID	Length	Data[0]	Data[1]
0	2	0x01	GW CAN ID

Picture 16.2 Message with ID field assigned.

After the GateWay is put to operational state, it will accept CAN-messages to its RxPDO1 address by length 1. The Message frame is explained below.

ID	Length	Data[0]
0x200+ID	1	Can Data

Bit0	Bit1	Bit2	Bit3	Bit4	Bit5	Bit6	Bit7
RxPDO1 Can Data Bit0	RxPDO1 Can Data Bit1	RxPDO1 Can Data Bit2	RxPDO1 Can Data Bit3	RxPDO1 Can Data Bit4	RxPDO1 Can Data Bit5	RxPDO1 Can Data Bit6	RxPDO1 Can Data Bit7

Picture 16.3 Message frame.

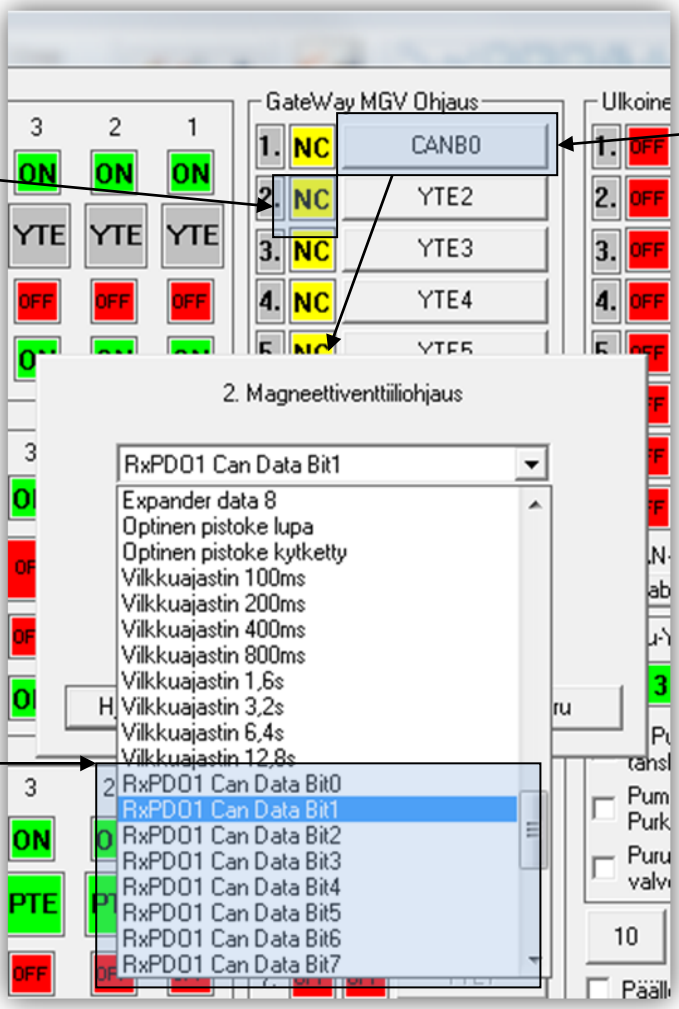
When the message is received by the Gateway, it will drive its internal MGV sockets according to its configuration Picture 16.4.

CAUTION! State of the GateWay solenoid valves is always according to the last received message when this function is used.

Configuration

The Solenoid valve control can be enabled by clicking this button, when button is pushed it will enable and show the status which it will have if active. “NO” means Normal Open, so in active state it will be closed. “NC” means Normal Closed, so in active state it will be open.

From the dropdown menu you can find the CAN frame bits which can be assigned to drive the selected solenoid valve socket.



By clicking the desired solenoid valve socket you can open the selection window.

Picture 16.4 Selecting the source to drive the solenoid valve socket.

Connection

Refer to the installation manual.

17. Reading GateWay information from CAN-bus

Functional Description

Every event that GateWay handles are seen on the CAN-bus. This gives the possibility to read, record, and log the tank truck functions etc. to the onboard computer. The GateWay CAN-bus is compliant to the CANopen standard so the message format and more detailed information of the protocol can be found from the said standard.

When the GateWay starts its CAN-bus is in preoperational state accordance with CANopen standard. In this preoperational state, you can still communicate GateWay with SDO messages, but it needs to be put to the operational state to start receiving PDO information from it. This is explained in CANopen Standard and one way to do this is to enable the whole CAN-bus (this can only be done by CAN-bus MASTER) by sending a message:

ID	Length	Data[0]	Data[1]
0	2	0x01	0x00

Picture 17.1 Sending message.

Enabling only GateWay, can be done by sending the same message with ID field assigned:

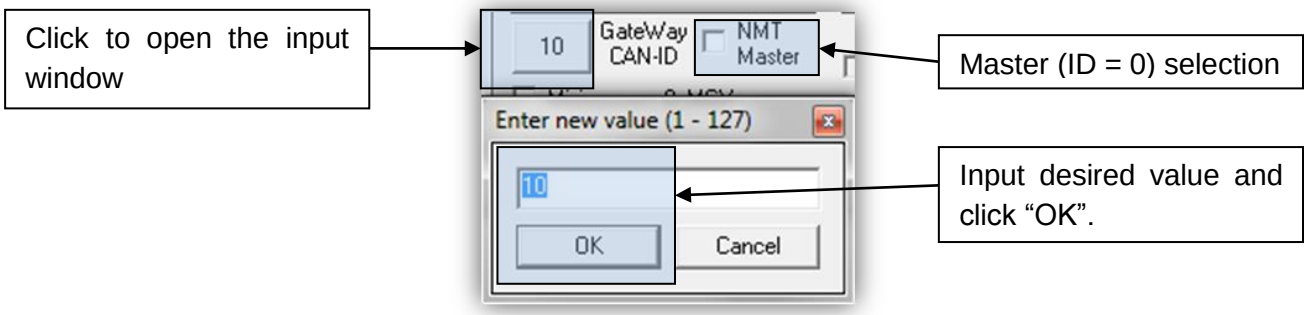
ID	Length	Data[0]	Data[1]
0	2	0x01	GW CAN ID

Picture 17.2 Message with ID field assigned.

After the GateWay is put to the operational state, it will start sending its TxPDO messages. The information that can be received from GateWay is explained in CAN-framework documentation, which can be downloaded from our website.

Configuration

There is only one value that needs to be set and that is the CANID (Picture 17.3). Remember that 0 ID is the MASTER ID and you can only have one MASTER on CAN-bus.



Picture 17.3 Setting CAN-bus parameters.

Connection

Refer to the installation manual.

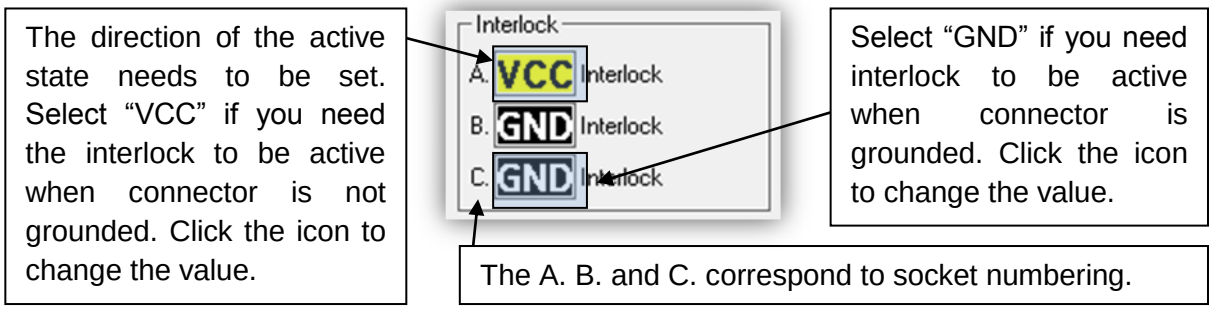
18. Interlocks

Functional Description

The Optic socket and the thermal socket become non-permissive when the interlock is active. With the interlock it can be ensured that: a. the handbrake is pulled or b. the main power is turned off before loading can proceed.

Configuration

Description of the configuration process is shown in Picture 18.1.



Picture 18.1 Interlock configuration.

Connection

Refer to the installation manual.

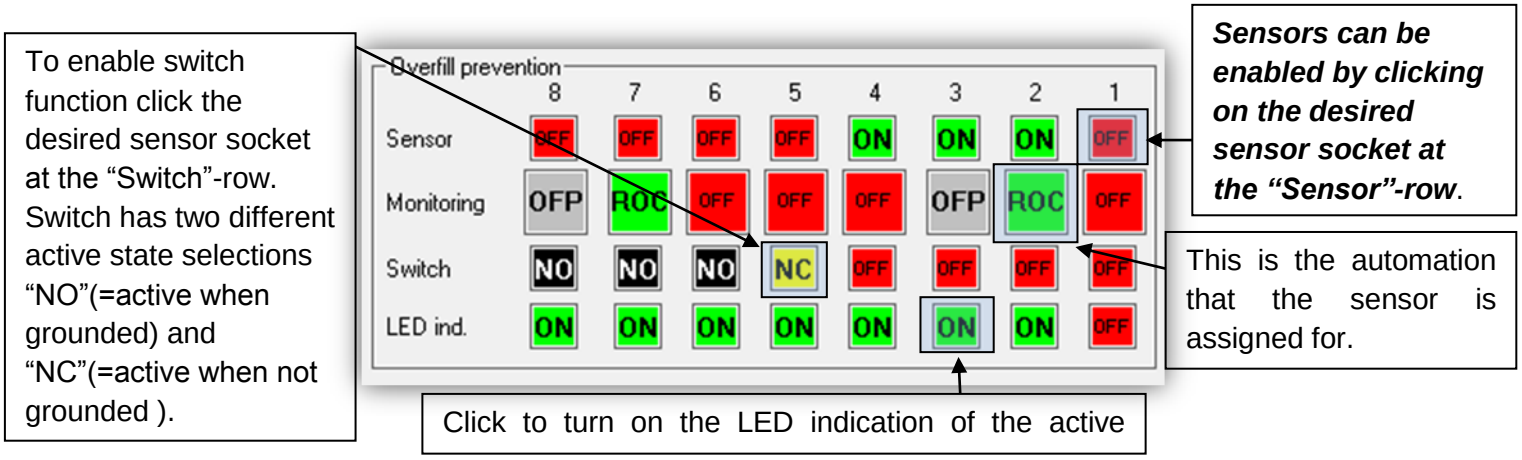
19. Sensors and Switches

Functional Description

There are 24 sensors terminals overall to be defined (see Picture 19.1). These are divided among three groups: “OFP”, “Level 2”, and “Bottom”. Each sensor socket is capable of housing either Optolevel Two Wire Optic Sensor or switch/coupler. The Sensors active state is when it is wet or when there is a problem with its connection. The active state of the switch/coupler can be configured.

Configuration

Description of the configuration process is shown in Picture 19.1.



Picture 19.1 Configuration of the sensor socket.

Connection

Refer to the installation manual.