

CuteLine

Gas Mixer Control RMV

Manual



Doc.-No. : HT-CL-MixRMV_MN_EN_06.2022

Version : 1.8

Date of Issue : 01.06.2022

HUEGLI TECH Switzerland

Manufacturers address

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Revision History

The changes and additions are added here every time a new revision of the document is made.

Rev	Description	Date	Author
1.0	First Version	01.11.2012	IF
1.1	Missing parts from machine guideline added	25.09.2013	UM
1.2	Rename of the manual – HT-CL-MixRMV	04.03.2014	UM
1.3	Modification of Graphics, Harness added	07.03.2014	IF
1.4	Page 11: Cable colours for Harness with Zeppelin changed (red – blue)	05.08.2014	UM
1.5	Adapted to new Harness	01.05.2015	IF
1.6	MiniMix Added	27.05.2016	IF
1.7	DIP SW2 changed from 4 bit type to 8 bit type,	09.01.2018	JM
1.71	S2:7 and S2:8 replaced old S2:4 function.	06.03.2018	RA
1.8	Added Analogue control resolution info.	01.06.2022	JM

Approved:

	Author	R & D	Product Manager
Date & Initials	01.11.2012 <i>IF</i>	01.11.2012 <i>TL</i>	07.05.2013 <i>UM</i>

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1 Installation declaration (for an incomplete machine)

Installation declaration (Directive 2006/42/EC, Appendix II B)

The manufacturer: Huegli Tech Murgenthalstrasse 30 4900 Langenthal Switzerland

hereby declares that the incomplete machinery:

General description: **HT-CL-MixRMV**

complies with the basic health and safety requirements of machinery directive 2006/42/EC Appendix I.

The special technical documents in compliance with Appendix VII part B have been produced.

The incomplete machine corresponds with the following other EC directives:

Low tension directive 2006/95/EC

The following harmonized norms were applied:

DIN EN ISO 12100:2011 (consolidation of EN ISO 12100-1; EN ISO 12100-2; EN ISO 14121-1)

Authorized representative for creation of the technical documents:

U. Moser, Murgenthalstrasse 30, CH - 4900 Langenthal

The special technical documents are transmitted in electronic form as required by individual state offices.

Operating the incomplete machine is not permitted until the incomplete machine is built into a machine that conforms to the provisions of the machinery directive and an EC conformity declaration in compliance with Appendix II A is provided.

Langenthal 26.09.2013



Moser Ulrich
Senior Product Manager
Huegli Tech AG

2 About this document

2.1 Information about the Manual

2.1.1 Contents

This Manual contain important details and information about the **CuteLine Mixer RMV Module**

2.1.2 Product affiliation

The Manual describes the finished product at the time of initial delivery.

Supplementary to this manual, special contractual agreements and technical documents apply for special CuteLine Mixer RMV Module versions and additional appliances.




2.1.3 This Manual is an integral part of the product

- To ensure trouble-free and safe operation as well as the settlement of any warranty claims, always read this manual first and observe all the information contained herein.
- Keep these Manual close to the product
- Always give the Manual to each subsequent owner or user. Huegli Tech shall not accept liability for any damages or malfunctioning caused by non-adherence to this Manual.
- Please contact Huegli Tech Customer Service if you have any further questions after reading these operating instructions.

2.2 Warning signs in this document

The warning signs in this document provide information about dangers which may arise during product operation. The relevant warning signs are displayed in the “safety” section page 5 and at the beginning of each chapter.

There are 3 types of warning signs:

Signal word	Meaning	Consequences of non-adherence
 DANGER	Warns of imminent danger	If not avoided will result in death or serious injury.
 WARNING	Warns of a possible danger	If not avoided could result in death or serious injury.
 CAUTION	Warns of a possibly dangerous situation	If not avoided could result in minor or moderate injury.

2.2.1 Warning sign design



DANGER

The type and source of the imminent danger is specified here!

Possible consequences of non-adherence are stated here.

➤ Protective measures against the danger are listed here

➤ Always read and carefully observe all warning signs.

2.3 Other symbols



NOTICE

The sign specifies possible property damages

➤ Protective measures against property damages are listed here.



This symbol displays safety instructions



This symbol displays useful and important information.



This symbol refers to an actual task.

3 Safety

3.1 Basic Safety Instructions



WARNING

Some of the CuteLine functions are subjected to changes depending on SW version.

The data in this manual only describes the product and are not warranty of performance or characteristic.



NOTICE

Huegli Tech believes that all information provided herein is correct and reliable and reserves the right to update at any time. Huegli Tech does not assume any responsibility for its use unless otherwise expressly undertaken.



CAUTION

Dangerous voltage

In no case touch the *terminals for voltage and current* measurement!

Always connect grounding terminals!

All parameters are pre-adjusted to their typical values. But the set points in the “**Basic settings**” settings group **!!must!!** be adjusted before the first start-up of the gen-set.

! WRONG ADJUSTMENT OF BASIC PARAMETERS CAN DESTROY THE GEN-SET !

The following instructions are for qualified personnel only. To avoid personal injury do not perform any action not specified in this User guide!!!

4 General

4.1 Introduction

The **HT-CL-MixRMV** is a Mixer Driver Module which is optimized for use with Huegli Tech Gas Mixer RM814, RM25 and RM 40 series.

This device performs either as single stepper motor control or two stepper motor control, and the types of mixer can be selected.

4.2 Safety instructions and Warnings

Before installing and starting the device, please read the operating instructions. These contain important notes for safety and use.

No liability can be accepted for damage arising from failure to follow the instructions or any inappropriate use.

The HT-CL-MixRMV unit may only be used for the manner of operation prescribed in the operating instructions and only in connection with third-party devices and components recommended or installed by us or software supplied by us. Any other use shall be considered inappropriate use and will result in the voiding of all liability and warranty claims against the manufacturer.

Interventions and alterations that influence the safety technology and the functionality of the Mixer module may be carried out only by the manufacturer.

Fault-free and safe operation is conditional upon competent transport, assembly and installation as well as qualified use and correct maintenance.

All relevant accident prevention regulations and other generally recognized technical safety and health and safety at work rules are to be observed. Fault-free functioning of the machinery and its peripheral components is only guaranteed with original accessory parts and spare parts.

The HT-CL-MixRMV unit is robust enough to be placed in a control cabinet with other operating control devices.

4.3 Guarantee terms and conditions

4.3.1 Correct use

The device is intended for exclusive use under the conditions described in the "Technical Data" rubric. Other uses are potentially dangerous. Huegli-Tech AG cannot accept liability for damage which results from incorrect use or application other than that for which it was intended.

4.3.2 Use of Accessories

Accessory parts may be installed or added only when they have been explicitly authorized by Huegli Tech AG. Any claims under guarantee, warranty or product liability shall be void if other parts are used.

The general guarantee terms and conditions of Huegli Tech AG shall apply.

5 Installation and connection

5.1 Mounting

The CuteLine modules are designed to be mounted on a 35 mm DIN Rail and can be easily attached and detached from the DIN rail.

To mount the module on the DIN rail, attached the upper portion of the module onto the DIN rail and press down the module until the hook clicks itself.

To remove the module from the DIN rail, simply unhook the lower part using a screwdriver and lift the enclosure from the DIN rail.



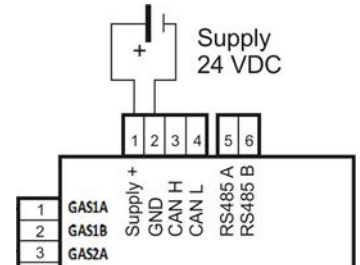
IMPORTANT

- Use of inappropriate cables may lead to wrong measured values.

5.2 Electrical connection

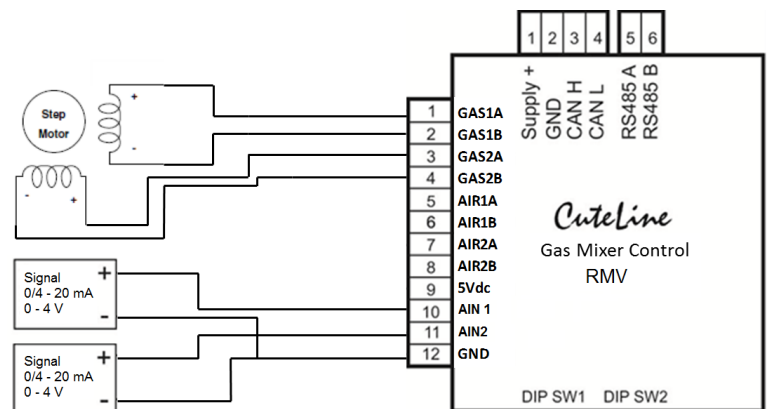
All connectors can be pulled out from the board for easier wiring.

The nominal supply input for CuteLine MixRMV Module is 24 VDC power supply but it can also work from a voltage range of 7-30VDC. The green LED on the front is turned on when the device is connected to the power supply. The supply input is reverse polarity protected.



5.3 Interface Connection

For two pairs of stepper motor control output, the first pair (GAS1x, GAS2x) is connected to the stepper motor regulates the gas flow. While the second pair (AIR1x, AIR2x) is connected to the stepper motor changes the airflow speed by movement of air regulator (Zeppelin). The xxxxA (E.g. AIR1A) must be connected to the +input of the winding of the motor and the xxxxB (E.g. AIR1B) must be connected to the - input of the winding of the motor. With DIP switch 2 (DIP SW2:1 to SW2:2), either one stepper motor control or two stepper motor controls and types of mixer can be selected.



Cable Connection

RM 814 / RM 25 / RM 40 (Harness CH-RMV-Lxx)

only Terminals GASxx are used

Terminal	Cable Colour	Pin on Deutsch Connector
GAS1A (1)	White	1
GAS1B (2)	Brown	2
GAS2A (3)	Green	3
GAS2B (4)	Yellow	4

RMV with Zeppelin (Harness CH-RMV-Z-Lxx)

Terminal	Cable Colour	Pin on Deutsch Connector
GAS1A (1)	White	1
GAS1B (2)	Brown	2

GAS2A (3)	Green	3
GAS2B (4)	Yellow	4
AIR1A (5)	Grey	5
AIR 1B (6)	Pink	6
AIR 2A (7)	Blue	7
AIR 2B (8)	Red	8

For two analogue inputs, using a 2 wire analogue position feedback sensor, one wire must be connected to x AIN and the other wire must be connected GND. If 3 wire sensors are used, the sensor supply (additional wire) must be connected to voltage supply for analogue sensors output (5Vdc). G AIN input supports the position feedback sensor for controlling gas regulation and A AIN supports the position feedback sensor for airflow control. The types of inputs (0-4 V or 0/4-20 mA) can be selected by DIP switch 2 (DIP SW2:3, SW2:7, SW2:8).

5.4 Stepper motor control output configuration

The stepper motor control output configurations can be configured by DIP SW2 is as follows:

Configuration	SW2:1	SW2:2
(GASx1, GASx2) output , MiniMix	OFF	ON
(GASx1, GASx2) and (AIR1x, AIR2x) output , Mixer RM 40-Z	OFF	OFF
(GASx1,GASx2) output , Mixer RM 814	ON	ON
(GASx1,GASx2) output , Mixer RM 25 / RM 40	ON	OFF

The analogue inputs configuration can be configured by DIP SW2 is as follows:

Configuration AIN 1 / AIN 2	SW2:3	SW2:7	SW2:8
0-20mA current input for both analogue inputs	ON	ON	ON
4-20mA current input for both analogue inputs	OFF	ON	ON
0-4V voltage input for both analogue inputs	ON	OFF	OFF

Configuration AIN 1	SW2:3	SW2:7	SW2:8
0-20mA current input for analogue input 1	ON	OFF	OFF
4-20mA current input for analogue input 1	ON	OFF	OFF
0-4V voltage input for analogue input 1	OFF	OFF	OFF

Configuration AIN 2	SW2:3	SW2:7	SW2:8
0-20mA current input for analogue input 2	ON	OFF	ON
4-20mA current input for analogue input 2	ON	OFF	ON
0-4V voltage input for analogue input 2	OFF	OFF	OFF

SW2:4, SW2:5, SW2:6 – not in use

Note: The voltage supply for Analogue sensors can be changed from 5Vdc to input voltage range (7Vdc-30Vdc) by removing resistor R71 and soldering 0 Ohm to place of resistor R70.

6 Stepper Motor Control Mode

The stepper motor control mode can be selected by using DIP SW1. There are two stepper motor control mode, Analogue Mode and Digital Mode.

SW1:7 **ON** Analogue Mode

SW1:7 **OFF**Digital Mode

6.1 Analogue Mode

In the analogue mode, the stepper motors in the mixer are controlled by 0/4-20mA or 0-4V analogue signals.

The movement of the mixer corresponding to the analogue signals is as follows:

Analogue Signal	%	Description
0/4mA (0V)	0%	Mixer fully close
20mA (4V)	100%	Mixer fully open

Analogue control resolution:

Mixer Type	Steps/Rev	Total Revs	Total Steps	Steps/mA (0-20mA)	Steps/mA (4-20mA)	Steps/V (0-4V)
ZEPPELIN	200	83	16600	830	1037.5	4150
RM25/RM40	200	7.2	1440	72	90	360
RM814	200	5	1000	50	62.5	250
MiniMix	200	1.4	280	14	17.5	70

6.2 Digital Mode

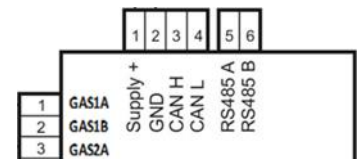
In the digital mode, the digital communication mode can be selected by DIP SW1 as either CAN bus control or ModBus control.

SW1:5 **ON** : ModBus Control
SW1:5 **OFF** : CAN Bus Control

7 Serial Connection

The CuteLine Gas Mixer Control RMV Module provides two kinds of serial connection:

Can Bus *J1939 Protocol*
RS485 *Mod Bus RTU*

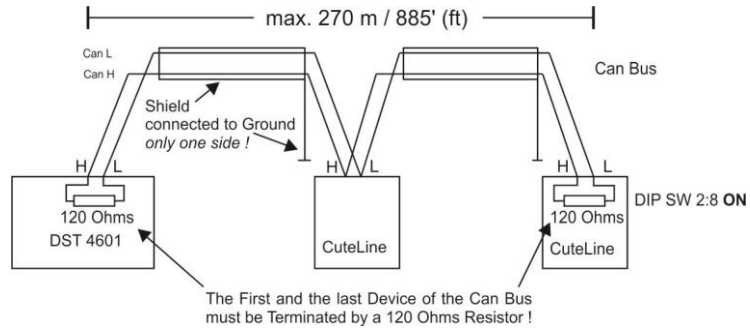


7.1 Can Bus Connection

Using the Can Bus connection, the bus cable must be connected to the terminals Can H(igh) and Can L(ow). If the module is the first or the last device in the bus, a termination resistor is required. There is a build in resistor (120 Ohms) which can be activated by switching SW1:8 to ON position.

Shielded cable (for example HELUKABEL CAN BUS 2x0.22) must be used for the CAN Bus connection.

Recommended Wiring



Address	SW1:1	SW1:2	SW1:3	SW1:4	SW1:5	SW1:7
1	OFF	OFF	OFF	OFF	OFF	OFF
2	ON	OFF	OFF	OFF	OFF	OFF
3	OFF	ON	OFF	OFF	OFF	OFF
4	ON	ON	OFF	OFF	OFF	OFF
5	OFF	OFF	ON	OFF	OFF	OFF
6	ON	OFF	ON	OFF	OFF	OFF
7	OFF	ON	ON	OFF	OFF	OFF
8	ON	ON	ON	OFF	OFF	OFF
9	OFF	OFF	OFF	ON	OFF	OFF
10	ON	OFF	OFF	ON	OFF	OFF
11	OFF	ON	OFF	ON	OFF	OFF
12	ON	ON	OFF	ON	OFF	OFF
13	OFF	OFF	ON	ON	OFF	OFF
14	ON	OFF	ON	ON	OFF	OFF
15	OFF	ON	ON	ON	OFF	OFF
16	ON	ON	ON	ON	OFF	OFF

**Address setting for CAN bus Mode
DIP switch 1**

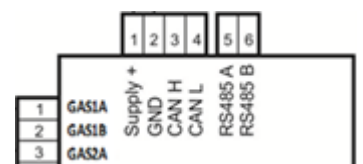
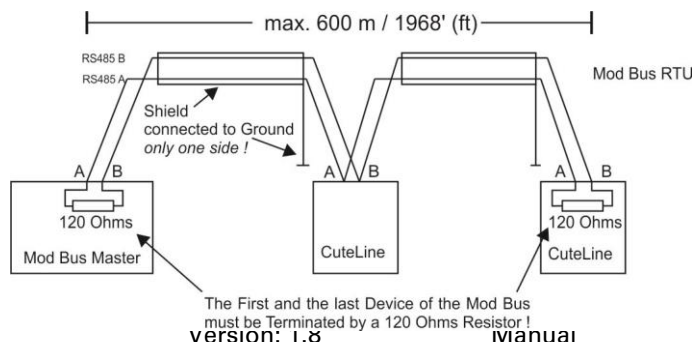
HINT

Any changes on the address settings (switches SW1:1 to SW1:7) are valid only after a Power Down Reset

7.2 Mod Bus RTU Connection

When working in this mode, the CuteLine Gas Mixer Control RMV Module works as a Mod Bus Slave so the Master has to request data from it. The connection must be on the terminals RS485A and RS485B. If the module is the last device in the bus, an external 120 Ohms termination resistor must be added.

Recommended Wiring



Identification:

version: 1.8

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Address setting for ModBus Mode

DIP switch 1

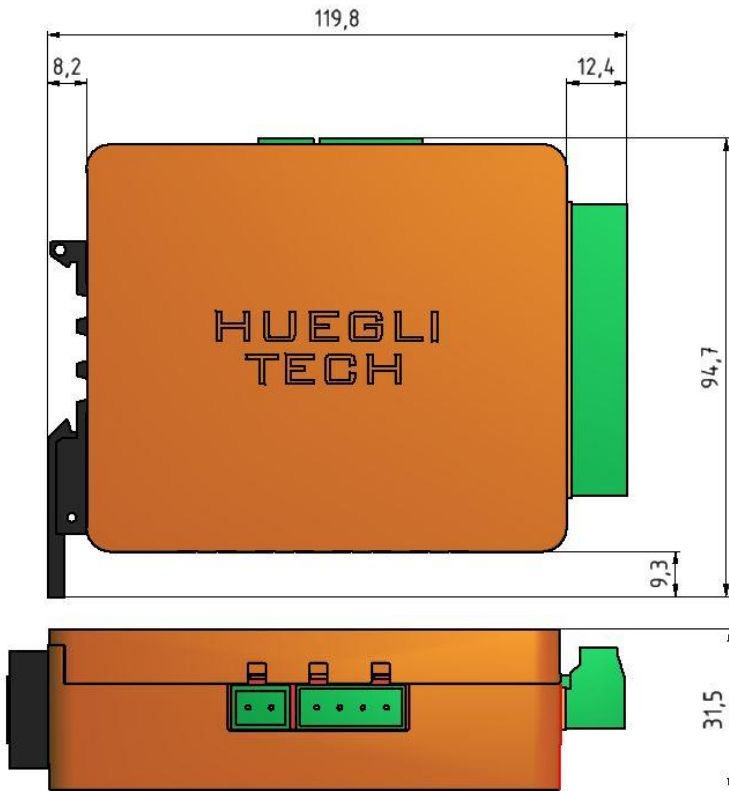
HINT

Any changes on the address settings (switches SW1:1 to SW1:7) are valid only after a Power Down Reset

Address	SW1:1	SW1:2	SW1:3	SW1:4	SW1:5	SW1:6	SW1:7
1	OFF	OFF	OFF	OFF	ON	*	OFF
2	ON	OFF	OFF	OFF	ON	*	OFF
3	OFF	ON	OFF	OFF	ON	*	OFF
4	ON	ON	OFF	OFF	ON	*	OFF
5	OFF	OFF	ON	OFF	ON	*	OFF
6	ON	OFF	ON	OFF	ON	*	OFF
7	OFF	ON	ON	OFF	ON	*	OFF
8	ON	ON	ON	OFF	ON	*	OFF
9	OFF	OFF	OFF	ON	ON	*	OFF
10	ON	OFF	OFF	ON	ON	*	OFF
11	OFF	ON	OFF	ON	ON	*	OFF
12	ON	ON	OFF	ON	ON	*	OFF
13	OFF	OFF	ON	ON	ON	*	OFF
14	ON	OFF	ON	ON	ON	*	OFF
15	OFF	ON	ON	ON	ON	*	OFF
16	ON	ON	ON	ON	ON	*	OFF

* = Baud rate selector
 OFF = 19200Baud
 ON = 9600Baud

8 Dimensions



9 Technical Data

9.1 Input/output parameters

Supply voltage.....	7 - 30 VDC, Reverse Polarity Protected
Current Consumption.....	40 mA with 24 VDC Input @25°C
Number of Inputs	2, Non-Isolated
Number of outputs	2, Non-Isolated
Types of outputs.....	Stepper motor control

9.2 Performance

Sensor Types/Range	Input Current	0-20mA/ 4-20mA
	Input Voltage	0 – 4V

9.3 Ambient

Operational Temperature.....	-40 to +85°C (-40 to +185°F)
Storage Temperature	-40 to +85°C (-40 to +185°F)
Relative Humidity	5 to 95%, Non-condensing
CE certificate.....	EN55011, EN50081-2, EN50082-2, EN61326-1

9.4 Standards / Regulation

Authorizing office	CE and RoHS requirements
Communication	CAN Bus SAE J1939, Modbus RTU

9.5 Reliability

Calibration.....	Factory Calibrated
------------------	--------------------

9.6 Dimension and weight

Dimensions	139 x 107 x 32 mm
Weight.....	0.372 kg

9.7 Configuration parameters

Wire Size	0.5 to 4 mm ² (22 to 12 AWG)
Mounting.....	DIN Rail 35 mm

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