



Operating Instructions

REOVIB MFS 268 –CAN

Appendix for CAN-Bus Programming

REO-USA, Inc

8450 E 47th Street  
Indianapolis, IN 46226  
USA  
Phone +1 (317) 899-1395  
Fax +1 (317) 899-1396  
<http://www.reo-usa.com>  
eMail: [info@reo-usa.com](mailto:info@reo-usa.com)

**REOVIB**

Controllers for vibratory feeders

Contents

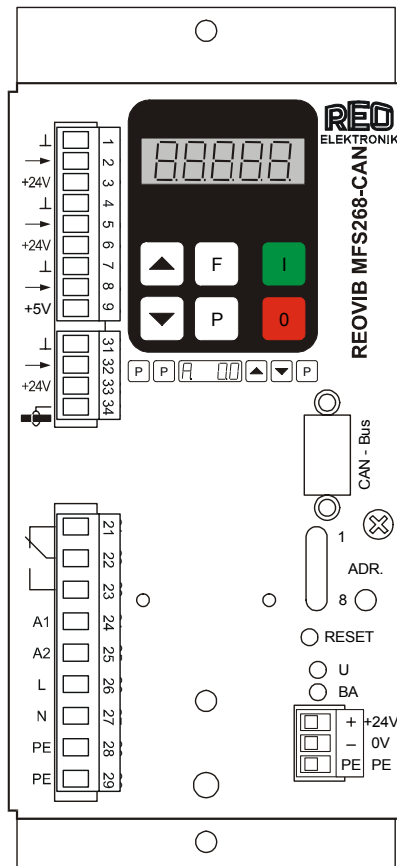
1.0 General .....	3
2.0 Technical Data .....	4
3.0 CAN-Interface .....	4
3.1 CAN-Codes .....	5
3.1.2 Commands .....	5
4.0 Addressing .....	6
5.0 Bus modes .....	6
5.1 Normal operation .....	7
5.1.1 Transmit to the controller .....	7
5.1.2 Receive from Controller .....	7
5.2 Parameter range .....	8
5.2.1 Construction of parameter addresses and values .....	8
5.2.2 Send write enable .....	9
5.2.3 Receive, confirmation of write enable .....	9
5.2.4 Send parameters .....	9
5.2.5 Remove write enable .....	10
5.2.6 Read parameter (send) .....	10
5.2.7 Bit configured parameter .....	11
6.0 Parameter table .....	12
7.0 Bus communication example for frequency controller REOVIB MFS 268 .....	13
7.1 Normal operation .....	13
7.2 Parameter operation .....	13
7.3 RESET on controller .....	14

**1.0 General**

The REOVIB MFS 268 series of Frequency controllers for vibratory feeder can be supplied with a CAN-Bus interface so that they can operate as slave units.

In “normal operation” the set point for the feeder amplitude is transmitted from a central control system and the unit’s ready/fault status is sent back. In a further parameter set-up mode the unit can be configured over the CAN-Bus. An external 24Vdc power supply is required for the interface.

The units are available as panel mounting or enclosed versions.



CAN-Bus switch layout

Pin	Function
1	
2	CAN-L
3	GND
4	
5	
6	GND
7	CAN-H
8	
9	+24V ON (optional)

The interface enables communication with the frequency controller by using a 4 data words (i.e. 16 Bit).

The unit is factory set for field-bus operation. If the controller is to be used for manual control then in Menu C 017 the Parameter S.I.F. should be set = “0”. For bus operation the Parameter S.I.F. must be set back to “1”.

## 2.0 Technical Data

Bus power source	24 V, DC (max. 24,5 V), 200 mA
Bus connector	Sub-D 9pole, with back-shell
Protocol	CAN-Bus, similar to CAN-OPEN

Note: A terminating resistor must be fitted to the first and last units.  
A resistor of 120Ω is connected between CAN-L and CAN-H.

## 3.0 CAN-Interface

All REO controllers with a CAN interface work as closely as possible to the address allocation according to the CAN-Open principle.

It will only support identifiers with 11 Bit lengths (Standard Frames).

By using the Pre-defined Connection Set the available number of possible identifiers that can be used is separated into various ranges.

A CAN-Open Network can have up to 128 units (a NMT-Master and 127 NMT-Slaves).

The REO interface supports the NMT commands the first PDO and the SDO.

The SDO answers only with objects 1000, 1001 and 1018. All other SDO messages will not be used and the unit will always reply that the function is not supported.

The supported PDO1 (CAN-Address + 200h) is specifically for REO use and as described below.

The units always reply to Address = CAN-Address + 180h. (PDO1).

Remote requests are not supported.

If the NMT- Master sends the instruction for operate transmission start (Start Node), the REO controllers begin to transmit a message every 1/10 second to PDO1 if the first valid PDO with the corresponding data is received from the Master.

The transmission is stopped by the NMT instruction (Stop-Node).

By using a status request (see below) the actual value can be requested on demand.

The "Node Guarding" function is supported. When the first "Guarding" request is sent this function is activated. If the "Guarding" signal continues the unit switches off after approximately 5 seconds and sends 8 bytes with data "00000000" in the PDO1.

**Note: If the transmission is interrupted (fault counter at maximum) the node is reinitiated with the sequence "Reset Node" and "Transmit Start".**

**3.1 CAN-Codes**

	Data length	Address	Data							
	XX	XX XX	XX	XX	XX	XX	XX	XX	XX	XX
	1 Byte	2 Byte	1. Byte	2. Byte	1.Byte	2.Byte	1.Byte	2.Byte	1.Byte	2.Byte
	inclusive Address		Word 1		Word 2		Word 3		Word 4	

**3.1.2 Commands**

Reset:

Unit (Reset Node) like Hardware-Reset	04	00 00 0000=NMT	81	00 00 is for all or address e.g.:05	00	00				
Bus (Reset Com.)	04	00 00	82	00 00 for all or for as unit address	00	00				

Run:

Send start (Start Node)	04	00 00	01	00 00=All, or address	00	00				
Send stop (Stop Node)	04	00 00	02	00 00=All, or address	00	00				

Setting sent to REOVIB unit

e.g.: Set point 50% to REO unit with address 3 (PDO1)

Data length	Address	Data								
XX	XX XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
0A	02 03	01	00	80 Set point 8000 = 50%	00	00	00	00	00	04 On Bit
Request actual value (Single request) (Unit replies with data in PDO1)										
0A	02 03	02	00	00	00	00	00	00	00	00

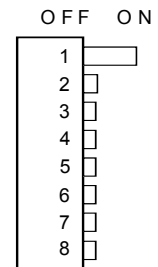
Status request

Data length	Address	Data								
XX	XX XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
		02	00	00	00	00	00	00	00	00
Unit replies with PDO 1 data										

#### 4.0 Addressing

The bus address is set by using the DIP switches in the front panel Address in Hex-code.	1	Address bit 0
	2	Address bit 1
	3	Address bit 2
	4	Address bit 3
	5	Address bit 4
	6	Address bit 5
	7	Baud Rate1 (BR1)
	8	Baud Rate2 (BR2)

Address switches



Four Baud rates 125,250,500 and 1000kBaund are supported.

Valid for units with DIP switches and display.

Baud rate	Dip switch	Display value rA
125 kBaund	Dip7=off Dip8=off	000
250 kBaund	Dip7=on Dip8=off	002
500 kBaund	Dip7=off Dip8=on	001
1000 kBaund	Dip7=on Dip8=on	003

Note: A RESET must be made after changing baud rate and address settings (non-power switching i.e. push reset button).

#### 5.0 Bus modes

There are two different basic methods of communication over the bus interface:

**Normal operation:** Controlling the frequency controller in a production process  
In this case the set point and enable (ON/OFF) signals are transmitted.

**Parameter operation:** Setting the controller to the required operating method and the limit values.  
In a special mode the parameter addresses and the parameters themselves are transmitted to the frequency controller and a received confirmation id sent back.  
In parameter operation the specific unit settings such as frequency, soft-start time, delay times etc. are adjusted.

**5.1 Normal operation**

In normal operation the set-point for the feeder throughput and digital signals such as the enable are set over the CAN-Bus network. The controller status (ready or fault) are reported back. All data words are in the range 0...FFFF H.

The bit values for communication words are explained below.

**5.1.1 Transmit to the controller**

H-Byte								L-Byte								<b>Word 2</b>
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	Set point 1, 16-Bit 100 % = FFFF H
H-Byte								L-Byte								<b>Word 3</b>
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	Reserved
H-Byte								L-Byte								<b>Word 4</b>
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	Control - Word Bit = "1" = Function ON All bits that are not used must be "0"
Mode bit													Enable			
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Control information (unit specific)																

0 = Normal operation  
1 = Parameter operation

Enable-Bit

**5.1.2 Receive from Controller**

H-Byte								L-Byte								<b>Word 2 (only in regulation mode)</b>
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	Feedback Acceleration 16bit 100% = 8000H
H-Byte								L-Byte								<b>Word 3</b>
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	Feedback actual output current 16bit 100% = 8000H ( in % von I-effective )
H-Byte								L-Byte								<b>Word 4</b>
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	Status - Word
Fault - Code											OFF					X = not defined Bit = "1" = Function ON
								Status information Unit specific								
00 (H) Unit not responding 57 (H) ERROR Peak 58 (H) ERROR OC 02 (H) ERROR OL overload 0C (H) ERROR ACC 05 (H) ERROR OU A5 (H) Ready C0 (H) Feedback Parameter mode																OFF-Bit Feedback

Only the unit status and actual output current are received.

## 5.2 Parameter range

The unit specific parameters can be read and changed in parameter operation.

A write enable must be sent before a parameter can be changed and one or more parameters can be adjusted. Afterwards the write enable must be cancelled. A read request must be sent for parameters to be read.

The reply format of word 4 is always "CODE" H. This indicates that the controller is in parameter operation.

### 5.2.1 Construction of parameter addresses and values

In parameter operation the most significant bit in word 2 is defined as a "read" or "write" bit (R / W) (1 = write, 0 = read) and the parameter address of the corresponding parameter must be given. The mode bit (most significant bit in word 4) is used to switch between normal and parameter operation (0 = Normal, 1 = Parameter operation).

<b>Word 2:</b>	<b>R / W – Bit + Address</b>	<b>e.g. 8000 H + 1009 H =&gt; 9009 H</b>
<b>Word 3:</b>	<b>Value of Parameter</b>	<b>e.g. 7FFF H</b>
<b>Word 4:</b>	<b>Mode bit = 1 + Control bit's</b>	<b>e.g. 8000 H + 0004 H =&gt; 9004 H</b>

Only the bits that correspond to the required setting may be changed for bit configured parameters. All other bits must **remain unchanged** otherwise some of the special factory settings in the controller may be altered!

Procedure for changing parameters:

1. Read the parameter code.
2. In the read parameter code change only those bits that require changing.
3. Switch on write enable.
4. Send the changed code back to the same address.
5. Switch off the write enable.



**5.2.2 Send write enable**

H-Byte								L-Byte								<b>Word 2</b>
<b>C0</b>								<b>DE</b>								Address write password =C0DE H
H-Byte								L-Byte								<b>Word 3</b>
<b>B5</b>								<b>E7</b>								Write password =B5E7 H
H-Byte								L-Byte								<b>Word 4</b>
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	Control - Code + 8000 H
<b>1 Mode bit</b>																Mode bit must be set to 1 !!
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	All bits not used must be set to "0"
																Bit = "1" = Function ON
Control information (controller specific)																

**5.2.3 Receive, confirmation of write enable**

H-Byte								L-Byte								<b>Word 2</b>
<b>C0</b>								<b>DE</b>								C0DE H
H-Byte								L-Byte								<b>Word 3</b>
<b>B5</b>								<b>E7</b>								B5E7 H
H-Byte								L-Byte								<b>Word 4</b>
<b>C0</b>								<b>DE</b>								C0DE H

New parameters can be sent after receipt of confirmation.

**5.2.4 Send parameters**

H-Byte								L-Byte								<b>Word 2</b>
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	Parameter address + R / W – Bit (16-Bit) = 0...FFFF H
<b>R / W</b>	<i>Parameter address</i>															
	H-Byte								L-Byte							
<b>XX</b>								<b>XX</b>								Parameter code (16-Bit) = 0...FFFF H
H-Byte								L-Byte								<b>Word 4</b>
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	Control - Code + 8000 H
<b>1 Mode bit</b>																Mode bit must be set to 1 !!
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	All bits not used must be set to "0"
																Bit = "1" = Function ON
Control information (unit specific)																

**Receive confirmation**

H-Byte								L-Byte								<b>Word 2</b>
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	
R / W	<i>Parameter address</i>															
	H-Byte								L-Byte							
xx								xx								Confirmation of parameter code
H-Byte								L-Byte								<b>Word 4</b>
C0								DE								Confirmation of parameter mode (always "CODE" H)

**5.2.5 Remove write enable**

H-Byte								L-Byte								<b>Word 2</b>
C0								DE								Address password = CODE H
H-Byte								L-Byte								<b>Word 3</b>
00								00								Password code 0000
H-Byte								L-Byte								<b>Word 4</b>
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	Control - Code + 8000 H
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Mode bit must be set to 1 !!
	All bits not used must be set to "0"															
Bit = "1" = Function ON																
Control information (unit specific)																

**5.2.6 Read parameter (send)**

H-Byte								L-Byte								<b>Word 2</b>
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	
R / W	<i>Parameter address</i>															
	H-Byte								L-Byte							
00								00								Read password code 0000
H-Byte								L-Byte								<b>Word 4</b>
80								00								Mode bit = 1 + Control bits

**Receive parameter**

H-Byte								L-Byte								<b>Word 2</b>
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	
R / W	<i>Parameter address</i>															
	H-Byte								L-Byte							
XX								XX								Parameter code
H-Byte								L-Byte								<b>Word 4</b>
C0								DE								Parameter mode confirmation

**5.2.7 Bit configured parameter**

Bit information

Change individual bits in a control word.

Each bit refers to a switch which switches a function on or off. In the user program the “bit manipulation” is isolated in a table. Depending on requirements several bits can be changed.

Parameter address 1800

H-Byte								L-Byte							Word 3	
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1		0
																Control - Word Bit = “1” = Function ON  Non-assigned bits cannot be changed
			S.P. 2. 2. Set point	E. Time out	-SE. Invert sensor	A.F.C. Automatic frequency search	ACC Closed loop control			Pot. External set point	En.C. Hide menus			4.20 External set point 4...20mA	E.S.P. Ext. Set point	

Parameter address 1801

H-Byte								L-Byte							Word 3	
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1		0
																Bit = “1” = Function ON  Non-assigned bits cannot be changed
															-En. Invert enable	

Parameter address 1803

H-Byte								L-Byte							Word 3	
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1		0
																Bit = “1” = Function ON Non-assigned bits cannot be changed
															Stop-Flag	

## 6.0 Parameter table

Non listed addresses cannot be changed

Setting:	Range	Display-Code	Factory setting	Access code	Parameter address HEX (.bit)	Code range HEX
<b>Feeder</b>						
• Amplitude (Feeder throughput)	0...100 %	A.	0 %	000, 002, 008, 096	100C	0...FFFF H
• Maximum output limit ( $U_{max}$ )	5...100 %	P.	90 %	096, 008	1009	0CCC...FFFF H
• Output frequency (depending on limits)	5...150 Hz	F.	100 Hz	096, 008 040	1005	01F4...3A98 H 500...15000 dec. (FL)...(FH.)
• Soft start ramp time	0...10 Sec.	/.	0,1 Sec.	096	1013	0...FFFF H
• Soft stop ramp time	0...10 Sec.	\.	0,1 Sec.	096	1012	0...FFFF H
• Change to external set point	0 / 1	E.S.P.	0	003	1800.0	0 / 1
• Set point 0(4)...20 mA	0 / 1	4.20	0	003	1800.1	0 / 1
• Set point using Potentiometer (for 3 / 6 / 8 A units)	0 / 1	POT.	0	003	1800.5	0 / 1
• Coarse / Fine control	0 / 1	S.P.2.	0	003	1800.12	0 / 1
• Invert enable	0 / 1	-En.	0	003	1801.1	0 / 1
<b>Closed loop (with Sensor)</b>						
• Switch to closed-loop control	0 / 1	ACC.	0	008	1800.8	0 / 1
• Proportional term	0...100	P.A.	40	008	100F	0...FFFF H
• Integral term	0...100	I.A.	100	008	1014	0...FFFF H
• Automatic frequency control	0 / 1	A.F.C.	0	008	1800.9	0 / 1
• Automatic frequency search	start	A.F.S.		008		
<b>Track control</b>						
• Switch-on time delay	0...60 Sec.	I.	1 Sec.	007, 167	1003	0...FFFF H
• Switch-off time delay	0...60 Sec.	O.	1 Sec.	007, 167	1002	0...FFFF H
• Invert sensor function	PNP / PNP invert	-SE.	0	007, 167	1800.10	0 / 1
<b>Sensor monitoring</b>						
• Sensor Time-out	0 / 1	E.En	0	015, 167	1800.11	0 / 1
• Sense time (Sensor Time-out)	30...240 Sec.	E.	180 Sec	015, 167	1004	0...FFFF H
<b>Interface (only available with interface option)</b>						
• Interface mode ON/OFF	0 / 1	S.I.F.	I	017	1801.8	0 / 1
<b>Service</b>						
• ERROR Reset	Reset	CLr.Er.		009	1400	C009 H
• Hide programming menus	0 / 1	Hd.C.		117	1800.4	0 / 1
• Choose user parameter menu Nr. 0...3	0...3	U.S.I.	0	143		
• Save user settings		PUSH.		143		
• Recall factory settings		FAC.		210		
• Choose user parameter menu Nr. 0...3	0...3	U.S.I.	0	210		
• Recall user settings		US.PA.		210		
<b>Service settings</b>						
• Service menu enable	0 / 1	En.S.	0	127	1803.4	0 / 1
• Display current value (0... 100 %)		i.		040	200A	0...8000 H
• Current limit	0...100 %	I.	100	040	1016	0...FFFF H
• Lower frequency limit	5...150 Hz	F.L.:	35	040	1020	01F4...3A98 H 500...15000 dec.
• Upper frequency limit	5...150 Hz	F.H.	140	040	1021	01F4...3A98 H 500...15000 dec.
• Output voltage limit (IN230V-OUT110V)	0 / 1	P.Li.	0	040	1803.5	0 / 1

**7.0 Bus communication example for frequency controller REOVIB MFS 268**

Variables are shown in *italics>*

**7.1 Normal operation**

(Set set-point: 70 %)

Send set point	Word	Content	send	Content	receive
2		<i>B332 H</i>	<b>Set point = 70 %</b>	---	---
3					
4		<i>0004 H</i>	Enable ON	<i>A5xx H</i>	Ready

(Controlling STOP)

Send set point	Word	Content	send	Content	receive
2		<i>B332 H</i>	<b>Set point = 70 %</b>	---	---
3					
4		<i>0000 H</i>	Enable OFF	<i>A5xx H</i>	Ready

**7.2 Parameter operation**

(e.g. Set frequency to 50 Hz and soft-start ramp time to 2 seconds)

Switch on write enable	Word	Content	send	Content	receive
2		<i>C0DE H</i>	Address write password	<i>C0DE H</i>	Confirmation
3		<i>B5E7 H</i>	Password code	<i>B5E7 H</i>	Confirmation
4		<i>8000 H + Control bits</i>	Set mode bit = 1	<i>C0DE H</i>	Confirmation

Write parameter	Word	Content	send	Content	receive
2		<i>9005 H</i>	Parameter address frequency + R / W - Bit	<i>9005 H</i>	Confirmation
3		<i>1388H</i>	<b>Frequency 50 Hz</b>	<i>1388 H</i>	Confirmation 50 Hz
4		<i>8000 H + Control bits</i>	Set mode bit = 1	<i>C0DE H</i>	Confirmation

Write parameter	Word	Content	send	Content	receive
2		<i>9013 H</i>	Parameter address Soft-start ramp time + R / W - Bit	<i>9013 H</i>	Confirmation
3		<i>3333 H</i>	<b>Soft-start 2 Sec.</b>	<i>3333 H</i>	Confirmation 2 Sec.
4		<i>8000 H + Control bits</i>	Set mode bit = 1	<i>C0DE H</i>	Confirmation

Remove write enable	Word	Content	send	Content	receive
2		<i>C0DE H</i>	Address write password	<i>C0DE H</i>	Confirmation
3		<i>0000 H</i>	Password code	<i>0000 H</i>	Confirmation
4		<i>8000 H + Control bits</i>	Set mode bit = 1	<i>C0DE H</i>	Confirmation

(Read only parameter)

Read	Word	Content	send	Content	receive
2		<i>1013 H</i>	Parameter address Soft-start ramp time	<i>1013 H</i>	Confirmation
3		<i>0000 H</i>	Read parameter	<i>8000 H</i>	Parameter value ( => 5 seconds)
4		<i>8000 H + Control bits</i>	Set mode bit = 1	<i>C0DE H</i>	Parameter mode confirmation

Example of changing bit parameter

Read parameter	Word	Content	send	Content	receive
	2	1801 H	Parameter address	1801 H	Confirmation
	3	0000 H	Read parameter	0000 H	Parameter value
	4	8000 H + Control bits	Set mode bit = 1	C0DE H	Parameter mode confirmation

**Change bits in read parameter value  
(e.g. Set bit 2 at address 1801 H to “1” = invert enable).**

Switch on write enable	Word	Content	send	Content	receive
	2	C0DE H	Address write password	C0DE H	Confirmation
	3	B5E7 H	Password code	B5E7 H	Confirmation
	4	8000 H + Control bits	Set mode bit = 1	C0DE H	Confirmation

Write parameter	Word	Content	send	Content	receive
	2	9801 H	Parameter address	9801 H	Confirmation
	3	0002 H	New parameter	0002 H	Confirmation
	4	8000 H + Control bits	Set mode bit = 1	C0DE H	Confirmation

Remove write enable	Word	Content	send	Content	receive
	2	C0DE H	Address write password	C0DE H	Confirmation
	3	0000 H	Password code	0000 H	Confirmation
	4	8000 H + Control bits	Set mode bit = 1	C0DE H	Confirmation

### 7.3 RESET on controller

Switch on write enable	Word	Content	send	Content	receive
	2	C0DE H	Address write password	C0DE H	Confirmation
	3	B5C9 H	Password code	BC97 H	Confirmation
	4	8000 H + Control bits	Set mode bit = 1	C0DE H	Confirmation

Write parameter	Word	Content	send	Content	receive
	2	9400 H	Parameter address reset + R / W - Bit	9400 H	Confirmation
	3	C009 H	<b>RESET.</b>	C009 H	
	4	8000 H + Control bits	Set mode bit = 1	C0DE H	

RESET command to be present for approximately 0.5 secs!