

Technical Description  
REOVIB MFS 268 –DN

DeviceNet Programming

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**REOVIB**  
Controllers for vibratory feeders

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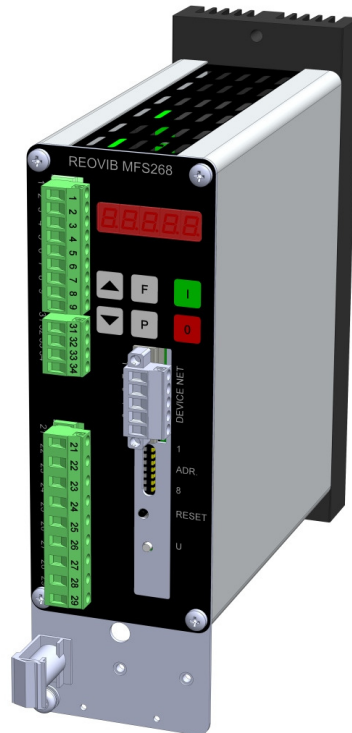
**1.0 General**

The REOVIB MFS 268 range of frequency inverters for vibratory feeders can operate with a DeviceNet interface as a DeviceNet slave.

In normal operation the set point, for the feeder throughput, can be sent from a PLC to the controller and the unit ready/fault status signals are fed back. In an additional, parameter mode the unit can be configured over the DeviceNet. An external power supply of 24 VDC is required for the interface

The units are available as housed or panel mounted versions.

The required ESD File is provided at the time of delivery.



Example image

DeviceNet connection		
pin	colour	function
1	black	V-
2	blue	CAN-L
3	bare	ground
4	white	CAN-H
5	red	V+

The interface enables communication with the frequency inverter, using 3 data words (i.e. 16 Bits). The three 16 Bit words are transmitted and acknowledged every bus cycle.

Units are factory set prior to delivery and so are configured for bus operation.

Should the unit be required for manual control then the parameter S.I.F. in menu C 017 should be set = "0". This must be reset back to S.I.F. = "1" for bus operation.

**2.0 Technical Data for DeviceNet Interface**

Bus Power Supply	24 V, DC (20..30 V), 200 mA
Bus connector for	Phoenix MSTB 2,5/5-STF-508, Best.Nr.: 1879065
Protocol	DeviceNet

Caution: You have to set an external termination resistor at the first and the last unit in the bus system.  
 A resistor with 120Ω is to set between CAN-L and CAN-H.

**3.0 ESD-File**

The following ESD file is required for DeviceNet interfacing

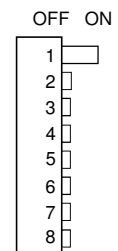
<b>ESD File Name</b>	<b>034f000C034f0221.eds</b>
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The GSD file is supplied on 3.5" Floppy disk with each unit or alternatively, visit [www.reo.de](http://www.reo.de) to download the file from the REO website

**4.0 Addressing and Baud rate**

The bus address setting is made using the DIP switches in the front panel.	1	Address bit 0
	2	Address bit 1
	3	Address bit 2
	4	Address bit 3
	5	Address bit 4
	6	Address bit 5
Addresses are in HEX	7	BR1
	8	BR2
Baud rate		

Address-switch



- BR1=0 & BR2=1 => 500 kB**
- BR1=1 & BR2=0 => 250 kB**
- BR1=0 & BR2=0 or BR1=1 & BR2=1 => 125 kB**

**5.0 Bus Operating Mode**

Two fundamental operating modes can be chosen for bus communication.

**Normal Operation:** Control of the frequency controller in production, in which case the Set point and ON/OFF control signals are transmitted

**Parameter Operation:** Adjustment of the frequency controller for the desired operation mode and limits. In a special mode the parameter and parameter addresses are transmitted and acknowledged.  
 In parameter operation, the unit's specific values, such as frequency, soft start time, timers and switching etc, are set.

**5.1 Programming for Bus operation**

In normal operation the set points for output voltage and the digital control signals, such as enable are set across the interface. The actual voltage/current values and unit status (ready or fault) are fed back.

All data words are within the range 0...FFFF H

The following communication words are given in bit form

**Please note! Depend on the used PLC there are two forms possible! See also next page.**

**5.1.1 Send to Controller Motorola Format / Big-Endian**

H-Byte								L-Byte								<b>Word 1</b>
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	Set point, 16-Bit 100 % = FFFF H
H-Byte								L-Byte								<b>Word 2</b>
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	Reserved
H-Byte								L-Byte								<b>Word 3</b>
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	Control - word Bit = „1“ = Function ON All unused bits MUST be set to `0`
<b>Mode bit</b>													<b>Enable</b>			
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 Reply from Controller Motorola Format / Big-Endian**

H-Byte								L-Byte								<b>Word 1 (only in regulation mode)</b>
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	Feedback actual acceleration 16 Bit 100% = 8000H
H-Byte								L-Byte								<b>Word 2</b>
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	Feedback actual output current, 16 Bit 100% = 8000H (in % von I-nom.)
H-Byte								L-Byte								<b>Word 3</b>
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	Status - Word X = Not defined (please do not use!) Bit = „1“ = Function ON
Status – code ERROR code											OFF					
								Status information Unit specific								
00	Unit not responding															
A5 (H)	Unit Ready															
57 (H)	ERROR Peak															
58 (H)	ERROR OC															
02 (H)	ERROR OL															
0C (H)	ERROR ACC															
05 (H)	ERROR OU															
C0 (H)	Acknowledge Parameter mode															

OFF - Bit  
 Acknowledge

Status, actual acceleration (only in regulation mode) and actual output current are received.

Depending on the used master control (PLC) it may be possible that must be the byte order rotated within the control words.  
 The byte order depends on whether the data processing in the PLC in Motorola format is done (big-endian) or Intel format (Little Endian).

**5.1.1.1 Send to Controller Intel-Format / Little-Endian**

L-Byte								H-Byte								<b>Word 1</b>
7	6	5	4	3	2	1	0	15	14	13	12	11	10	9	8	Set point, 16-Bit 100 % = FFFF H
L-Byte								H-Byte								<b>Word 2</b>
7	6	5	4	3	2	1	0	15	14	13	12	11	10	9	8	Reserved
L-Byte								H-Byte								<b>Word 3</b>
7	6	5	4	3	2	1	0	15	14	13	12	11	10	9	8	Control - word  Bit = „1“ = Function ON  All unused bits MUST be set to `0`
0	Mode bit												0	Enable		
Control information (unit specific)																

0 = Normal operation  
 1 = Parameter operation

Enable - bit

**5.1.2.1 Reply from Controller Intel-Format / Little-Endian**

L-Byte								H-Byte								<b>Word 1 (only in regulation mode)</b>
7	6	5	4	3	2	1	0	15	14	13	12	11	10	9	8	Feedback actual acceleration 16 Bit 100% = 8000H
L-Byte								H-Byte								<b>Word 2</b>
7	6	5	4	3	2	1	0	15	14	13	12	11	10	9	8	Feedback actual output current, 16 Bit 100% = 8000H (in % von I-nom.)
L-Byte								H-Byte								<b>Word 3</b>
Status – code ERROR code																Status - Word  X = Not defined (please do not use!)  Bit = „1“ = Function ON
								X	X	X	OFF	X	X	X	X	
								Status information Unit specific								
00	Unit not responding															
A5 (H)	Unit Ready															
57 (H)	ERROR Peak															
58 (H)	ERROR OC															
02 (H)	ERROR OL															
0C (H)	ERROR ACC															
05 (H)	ERROR OU															
C0 (H)	Acknowledge Parameter mode															

OFF - Bit  
 Acknowledge

Status, actual acceleration (only in regulation mode) and actual output current are received.

## 5.2 Parameter Operation

In parameter operation, the specific unit parameters can be monitored and adjusted. A `write` enable must be transmitted before parameters can be altered. On closing, the `write` enable must be cancelled.

A `read` request must be sent before data can be read.

Word 3 in the acknowledge is always `CODE H`. This indicates that the controller is in parameter mode.

### 5.2.1 Creating parameter address's and values

In parameter operation the most significant bit (msb) in Word 1 is defined as a read or write bit (R/W), where 1 = write and 0 = read, this should be accompanied by the corresponding parameter address.

The mode bit (msb in Word 3) is used to select normal or parameter operation, 0 = Normal or 1 = Parameter operation.

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

**For bit orientated parameters, ONLY those bits relating to the required function may be changed, all other bits MUST remain unaltered, otherwise factory specific settings may be inadvertently altered!**

#### Procedure for changing bit parameters:-

1. Select parameter value
2. Change only the required bit (s) in the selected parameter
3. Send `write` enable
4. Send the changed parameters back to the same address
5. Close the `write` enable

Please consider data format (Motorola / Intel format)

**5.2.2 Send Write Enable**

H-Byte								L-Byte								<b>Word 1</b>
C0								DE								Write Enable Address =C0DE H
H-Byte								L-Byte								<b>Word 2</b>
B5								E7								Write Enable =B5E7 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	Control - Word + 8000 H
1	Mode bit															Mode Bit must be set to 1 !!
		0	0	0	0	0	0	0	0	0	0	0	0	0	0	All unused bits must be set to "0" Bit = „1“ = Function ON
Control Information unit specific																

**5.2.3 Receive, Acknowledge Write Enable**

H-Byte								L-Byte								<b>Word 1</b>
C0								DE								C0DE H
H-Byte								L-Byte								<b>Word 2</b>
B5								E7								B5E7 H
H-Byte								L-Byte								<b>Word 3</b>
C0								DE								C0DE H

The parameters can be send after receipt of the acknowledge

**5.2.4 Send Parameter**

H-Byte								L-Byte								<b>Word 1</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
R / W	<i>Parameter address</i>															
H-Byte								L-Byte								<b>Word 2</b>
XX								XX								Parameter value (16-Bit) = 0...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	Control - Word + 8000H
1	Mode bit															Mode must be set to `1`!
		0	0	0	0	0	0	0	0	0	0	0	0	0	0	All unused bits must be set to `0` Bit = „1“ = Function ON
Control Information (unit specific)																

Please consider data format (Motorola / Intel format)



**Received acknowledge**

H-Byte								L-Byte								<b>Word 1</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								Acknowledge the Parameter value
H-Byte								L-Byte								<b>Word 3</b>
C0								DE								Acknowledge the Parameter mode (always „CODE“ H)

**5.2.5 Close write enable**

H-Byte								L-Byte								<b>Word 1</b>
C0								DE								Write Enable Address = CODE H
H-Byte								L-Byte								<b>Word 2</b>
00								00								Enable Value 0000
H-Byte								L-Byte								<b>Word 3</b>
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	Control Word + 8000 H  Mode must be set to `1`!  All unused bits must be set to `0`  Bit = „1“ = Function ON
Mode bit																
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Steuerinformation (gerätespezifisch)

**5.2.6 Parameter read (send)**

H-Byte								L-Byte								<b>Word 1</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 Enable Value = 0000
H-Byte								L-Byte								<b>Word 3</b>
80								00								Mode bit = 1 + Control bits

**Received parameter**

H-Byte								L-Byte								<b>Word 1</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 value
H-Byte								L-Byte								<b>Word 3</b>
C0								DE								Acknowledge Parameter mode

Please consider data format (Motorola / Intel format)

**5.2.7 Bit oriented Parameter**

Bit information.

Changing individual Bits in a control word.

Each Bit corresponds to a switch that switches a function on or off. In the user program this “Bit manipulation” must be isolated in a table. When necessary more Bits can be changed simultaneously.

Parameter address 1800

H-Byte								L-Byte							Word 2	
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1		0
																Control - Word Bit = „1“ = Function ON  Bits not shown <u>must not be altered</u>
			S.P. 2. Setpoint	E. Time out	-SE. Invert Sensor	A.F.C. Autom. Frequency Control	ACC Regulation mode			Pot. External Setpoint	En.C. Hide Menus			4.20 Ext. Setpoint 4...20mA	E.S.P. Ext. Setpoint	

Parameter address 1801

H-Byte								L-Byte							Word 2	
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1		0
																Bit = „1“ = Function ON  Bits not shown <u>must not be altered</u>
														-En. enable invert		

Parameter address 1803

H-Byte								L-Byte							Word 2	
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1		0
																Bit = „1“ = Function ON  Bits not shown <u>must not be altered</u>
														Stop-Flag		

Please consider data format (Motorola / Intel format)

## 6.0 Parameter Table

**Non listed addresses cannot be altered !**

Parameter:	Adjustment	Display-Code	Factory Setting:	Entry Code	Parameter address HEX (.bit)	Value HEX
<b>Vibratory feeder</b>						
• Amplitude (throughput)	0...100 %	A.	0 %	000, 002, 008, 096	100C	0...FFFF H
• Maximum control limit ( $U_{max}$ )	5...100 %	P.	90 %	096, 008	1009	0CCC...FFFF H
• Vibrating frequency	5...150 Hz	F.	100 Hz	096, 008 040	1005	01F4...3A98 H 500...15000 dec. (FL)...(FH.)
• Soft start ramp up	0...10 sec.	/.	0,1 sec.	096	1013	0...FFFF H
• Soft stop ramp down	0...10 sec..	\.	0,1 sec.	096	1012	0...FFFF H
• Switch 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
• Potentiometer set point (at 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>Regulation (with sensor)</b>						
• Switch to regulation	0 / 1	ACC.	0	008	1800.15	0 / 1
• P characteristic	0...100	P.A.	40	008	100F	0...FFFF H
• I characteristic	0...100	I.A.	100	008	1014	0...FFFF H
• Automatic frequency control	0 / 1	A.F.C.	0	008	1800.9	0 / 1
• Start 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	PNP / PNP inverse	-SE.	0	007, 167	1800.10	0 / 1
<b>Sensor control</b>						
• Sensor Time-out	0 / 1	E.En	0	015, 167	1800.11	0 / 1
• Sense time delay (Sensor Time-out)	30...240 Sek.	E.	180 sec.	015, 167	1004	0...FFFF H
<b>Interface (option)</b>						
• Interface OFF / ON	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
• Choice user parameter menus Nr. 0...3	0...3	U.S.I.	0	143		
• Save user settings		PUSH.		143		
• Recall factory settings		FAC.		210		
• Save user parameter No. 0...3	0...3	U.S.I.	0	210		
• Recall user parameter		US.PA.		210		
<b>Service limits</b>						
• Open service menu	0 / 1	En.S.	0	127	1803.4	0 / 1
• Show output current (0... 100 %)		i.		040	200A	0...8000 H
• Current limit	0...100 %	I.	100	040	1016	0...FFFF H
• Min frequency limit	5...150 Hz	F.L:	35	040	1020	01F4...3A98 H 500...15000 dec.
• Max frequency limit	5...150 Hz	F.H.	140	040	1021	01F4...3A98 H 500...15000 dec.
• Output limited (IN230V-OUT110V)	0 / 1	P.Li.	0	040	1803.5	0 / 1

**7.0 Example of bus communication with Frequency controller REOVIB MFS 268**

Variable values are shown in *italics*. Please consider data format (Motorola / Intel format)

**7.1 Normal mode**

(Set set point to 70 %)

Send Setpoint	Word	Code	send	Code	Received
1		<i>B332 H</i>	<b>Setpoint = 70 %</b>	---	---
2					
3		<i>0004 H</i>	Enable On	<i>A5xx H</i>	Ready

Enable ON, Stop controller (with enable)

Send Setpoint	Word	Code	send	Code	Received
1		<i>B332 H</i>	<b>Setpoint = 70 %</b>	---	---
2					
3		<i>0000 H</i>	Enable OFF	<i>A5xx H</i>	Ready

**7.2 Parameter mode**

(e.g. set frequency to 50 Hz and soft start to 2 second)

Open Write enable	Word	Code	send	Code	Received
1		<i>C0DE H</i>	Write enable Address	<i>C0DE H</i>	Acknowledge
2		<i>B5E7 H</i>	Write enable value	<i>B5E7 H</i>	Acknowledge
3		<i>8000 H + Control bits</i>	Set mode bit = 1	<i>C0DE H</i>	Acknowledge

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

Write parameter	Word	Code	send	Code	Received
1		<i>9013 H</i>	Parameter address Soft start + R / W - Bit	<i>9013 H</i>	Acknowledge
2		<i>3333 H</i>	<b>Soft start 2 Sec.</b>	<i>3333 H</i>	Acknowledge 2 Sek.
3		<i>8000 H + Steuerbits</i>	Set mode bit = 1	<i>C0DE H</i>	Acknowledge

Close Write enable	Word	Code	Send	Code	Received
1		<i>C0DE H</i>	Write enable Address	<i>C0DE H</i>	Acknowledge
2		<i>0000 H</i>	Write enable Value	<i>0000 H</i>	Acknowledge
3		<i>8000 H + Control bits</i>	Set mode bit = 1	<i>C0DE H</i>	Acknowledge

(read only the Parameter)

Read	Word	Code	send	Code	Received
1		<i>1013 H</i>	Parameter address Soft start	<i>1013 H</i>	Acknowledge
2		<i>0000 H</i>	Read parameter	<i>8000 H</i>	Parameter value ( => 5 Second)
3		<i>8000 H + Control bits</i>	Set mode bit = 1	<i>C0DE H</i>	Acknowledge Parameter mode

Example of bit parameter change

Read Parameter	Word	Code	send	Code	Received
	1	1801 H	Parameter address	1801 H	Acknowledge
	2	0000 H	Read parameter	0000 H	Parameter value
	3	8000 H + Control bits	Set mode bit = 1	C0DE H	Acknowledge Parameter mode

**Change bit in selected parameter value  
 (e.g. Set bit 2 at address 1801 H to „1“, = Enable invert).**

Open Write enable	Word	Code	send	Code	Received
	1	C0DE H	Write Enable Address	C0DE H	Acknowledge
	2	B5E7 H	Write Enable Value	B5E7 H	Acknowledge
	3	8000 H + Control bits	Set mode bit = 1	C0DE H	Acknowledge

Write Parameter	Word	Code	send	Code	Received
	1	9801 H	Parameter address	9801 H	Acknowledge
	2	0002 H	new Parameter	0002 H	Acknowledge
	3	8000 H + Control bits	Set mode bit = 1	C0DE H	Acknowledge

Close Write enable	Word	Code	send	Code	Received
	1	C0DE H	Write Enable Address	C0DE H	Acknowledge
	2	0000 H	Write Enable Value	0000 H	Acknowledge
	3	8000 H + Control bits	Set mode bit = 1	C0DE H	Acknowledge

### 7.3 RESET Controller

Open Write enable	Word	Code	send	Code	empfangen
	1	C0DE H	Write Enable Address	C0DE H	Acknowledge
	2	B5C9 H	Write Enable Value	B5C9 H	Acknowledge
	3	8000 H + Control bits	Set mode bit = 1	C0DE H	Acknowledge

Write Parameter	Word	Code	send	Code	Received
	1	9400 H	Parameter address Reset + R / W - Bit	0000 H	Acknowledge
	2	C009 H	<b>RESET.</b>	0000 H	
	3	8000 H + Control bits	Set mode bit = 1	C0DE H	

Allow approximately 0.5 sec. for RESET

Please consider data format (Motorola / Intel format)