



Operating Instructions

REOVIB MFS 268-RS232

Appendix – Interface Programming

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REOVIB

Control Units for the Vibratory Feeder Industry

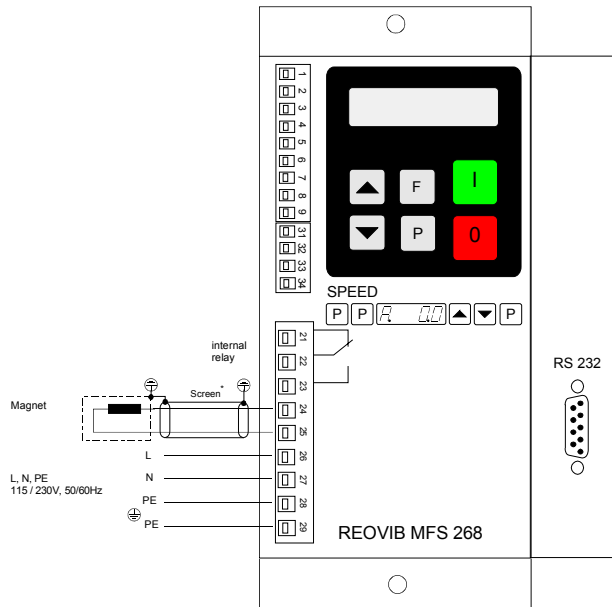
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1.0 General

The REOVIB MFS 268 range of controllers for vibratory feeders can be operated from an RS 232 interface. To do this the frequency controller must be set up to receive serial data, using Menu “C 017” (S.I.F. = 1). The set point for feeder throughput is adjusted in “Running Mode“ and the controller status (ready/fault) is transmitted back. The controller can be configured, using the serial interface, in a further “Parameter Mode“.

Units are available in two versions, panel mounting or enclosed.



The interface allows communication with the frequency controller by using 3 data words (each having 16 bits).

Controllers are always factory configured for interface operation. Should the unit be required for manual set-up then the Parameter S.I.F. must be set = “0“ in Menu C 017. To return to serial interface operation S.I.F. must be reset = “1“.

2.0 Serial Interface Data

The Parameters for serial interface are set as follows:-

Baud rate: 9600, 8 Data bits, 1 Stop bit, No Parity, No Handshaking (DTR = +12V, RTS = - 12 V)

Pin layout

PIN Nr.	Signal
1	-
2	RXD
3	TXD
4	-
5	GND
6	-
7	-
8	-
9	-

The serial interface information is sent as a character string that is closed with a RETURN (CR) for synchronization. Within the string there are three used data words each having four characters (Bytes). The complete data string therefore comprises 3 x 4 + 1 characters.

Each part character string of the data word is the hexadecimal code equivalent of the 16 bit integer expression of the used data. Only upper case characters "0" to "9" and "A" to "F" are permitted. Each character is transmitted with 8 bits represented by ASCII code. Each part of the string contains four characters and if necessary a leading zero is used.

The value range of the used information is depicted in a different manner to the value range of the internal data format (16 bit integer). To differentiate, the values and the bit coded status information are relative or absolute, signed or unsigned and limited or unlimited.

Type	Signed	Limiting	Example	Value range	Form
Relative	Not signed	Limited	Set point, Setting range	(0...100)%	("0000"..."FFFF")
Relative	Not signed	Unlimited	Effective value	(0...200)%	("0000"..."FFFF")
Relative	Signed	Limited	Regulation range, phase position	(-100...100)%	("8000"..."7FFF")
Absolute	Not signed	Limited	Time, frequency	Individual	Individually scaled
bit			Status	True, false	("0000"..."FFFF")

The character string is controlled by the RETURN's for the correct length and existence and so invalid information is disregarded. The watchdog switches the set point to zero if non valid information is received.

Example:

Adjust set point to 70 % and enable ON.

RS 232 Character String: "B33200000004"+CR

3.0 Serial Interface Modes

When serial interface communication is used there are two basic operating modes:-

Normal operation: Control of the frequency controller in a production process.
In this mode the set point and control signals (On/Off) are transmitted..

Parameter operation: Setting of the frequency controller to the required operating mode and limits.
In a special mode the parameters and their addresses are sent to the frequency controller and are received back as confirmation
In parameter mode, specific controller values such as frequency, soft start, time delays etc. are adjusted.

3.1 Normal operation

In normal operation the serial interface is used to adjust the set point for the feeder throughput and the digital control signals e.g. the enable. The unit status (ready or fault) is reported
All data words are in the range 0000...FFFF H.

The communications words are shown in bit form as follows:-.

3.1.1 Transmission to the controller

H-Byte								L-Byte								Wort 1
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								Wort 2
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	Reserved
H-Byte								L-Byte								Wort 3
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	Control word
Mode bit																Bit = „1“ = Function ON
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	All non used bits must be “0“
Control information (unit specific)																

0 = Normal operation
1 = Parameter operation

Enable bit

3.1.2 Response from controller

H-Byte								L-Byte								Word 1									
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0										
H-Byte								L-Byte								Word 2									
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0										
H-Byte								L-Byte								Word 3									
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	Status word									
Fault code																X = not defined									
								×	×	×	Freigabe	×	×	×	×	Bit = “1“ = Function ON									
								Status information Unit specific																	
00	Unit not responding							<table border="0"> <tr> <td>70 (H)</td><td>Over temperature</td> </tr> <tr> <td>58 (H)</td><td>Overload</td> </tr> <tr> <td>A5 (H)</td><td>Ready</td> </tr> <tr> <td>C0 (H)</td><td>Feedback</td> </tr> <tr> <td></td><td>Parameter mode</td> </tr> </table>								70 (H)	Over temperature	58 (H)	Overload	A5 (H)	Ready	C0 (H)	Feedback		Parameter mode
70 (H)	Over temperature																								
58 (H)	Overload																								
A5 (H)	Ready																								
C0 (H)	Feedback																								
	Parameter mode																								

Enable bit
Report

Only the unit status is reported.

3.2 Parameter operation

The unit specific parameters can be read and changed in Parameter Operation.

Before writing parameters a write enable must be sent. Then it is possible to change a single or several parameters. On closing the write enable must be sent again. A read request only is required for reading

The response value of Word 3 is always "CODE" H. This is used by the controller to indicate that it is running in parameter mode.

3.2.1 Parameter address and value formatting

In parameter operation the most significant bit in Word 1 defines the "read/write" (R/W) bit (1 = Write, 0 = Read) and must be given with parameter address of the corresponding parameter.

Normal or parameter operation are selected by using the mode bit (most significant bit in word 3 (0 = Normal-, 1 = Parameter operation).

Word 1:	R / W – Bit + Address	e.g. 8000 H + 1009 H => 9009 H
Word 2:	Parameter value.	e.g. 7FFF H
Word 3:	Mode bit = 1 + control bits	e.g. 8000 H + 0004 H => 9004 H

For bit configured parameters only **those bits that correspond to the required characteristic** may be altered. All **other bits must not be changed**; otherwise the basic settings for the load could be altered.

The procedure for adjustment using bit parameters is as follows:-

1. Read parameter value.
2. Only alter the required bit value(s) for the parameter which is chosen.
3. Switch on the write enable.
4. Write the changed parameter value back to the same address.
5. Remove the write enable.

3.2.2 Send Write enable

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

3.2.3 Receive, confirm write enable

H-Byte								L-Byte								Word 1 C0DE H
C0								DE								
H-Byte								L-Byte								Word 2 B5E7 H
B5								E7								
H-Byte								L-Byte								Word 3 C0DE H
C0								DE								

New parameter can be sent after confirmation has been received.

3.2.4 Send Parameter

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

Receive Confirmation

H-Byte								L-Byte								Word 1
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 parameter value
H-Byte								L-Byte								Word 3
C0								DE								Confirmation parameter mode (always "CODE" H)

3.2.5 Remove Write Enable

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

3.2.6 Read Parameter (send)

H-Byte								L-Byte								Word 1
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 key value 0000
H-Byte								L-Byte								Word 3
80								00								Mode bit = 1 + Control Bits

Receive Parameter

H-Byte								L-Byte								Word 1
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								Word 3
C0								DE								Confirmation parameter mode

4.0 Parameter Table

Non listed addresses should not be changed.

Settings	Setting range	Display-Code	Factory settings	Entry code	Parameter address HEX (.bit)	Value range HEX
Förderer						
• Amplitude (throughput)	0...100 %	A.	0 %	000, 002, 008, 096	100C	0...FFFF H
• Maximum control range (U_{max})	5...100 %	P.	100 %	096, 008	1009	0CCC...FFFF H
• Vibrating frequency (depending on limits)	5...150 Hz	F.	100 Hz	096, 008	1005	01F4...3A9A H 500...15000 dec. (FL.)...(FH.)
• Soft start ramp	0...10 Sec.	/.	0,1 Sec.	096	1013	0...FFFF H
• Soft stop ramp	0...10 Sek.	\.	0,1 Sek.	096	1012	0...FFFF H
• Connect 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 (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
Regulation (with sensor)						
• Switch to regulation mode	0 / 1	ACC.	0	008	1800.15	0 / 1
• Proportional characteristic	0...100	P.A.	40	008	100F	0...FFFF H
• Integral characteristic	0...100	I.A.	0	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		
Track control						
• Switch-on delay	0...60 Sec.	I.	5 Sec.	007, 167	1003	0...FFFF H
• Switch-off delay	0...60 Sec.	O.	5 Sec.	007, 167	1002	0...FFFF H
• Invert sensor	PNP / PNP inverse	-SE.	PNP	007, 167	1800.10	0 / 1
Sensor Monitoring						
• Activate Sensor Time-out	0 / 1	E.	0	015	1800.11	0 / 1
• Time (Sensor Time-out)	30...240 Sec.	E.E.	Not active	015	1004	0...FFFF H
Serial Interface (only when option is fitted)						
• Serial Interface On/Off	0 / 1	S.I.F.	I	017	1801.8	0 / 1
Service						
• ERROR Reset	Reset	CLr.Er.		009	9004	C009 H
• Hide programming menus	0 / 1	Hd.C.		117	1800.4	0 / 1
• User parameter menus #. 0...3	0...3	U.S.I.	0	143		
• Save user settings		PUSH.		143		
• Return to factory settings		FAC.		210		
• Select user parameter menu # 0...3	0...3	U.S.I.	0	210		
• Return to user settings		US.PA.		210		
Service Basic Settings						
• Service Menu Enable	0 / 1	En.S.	0	127	1803.4	0 / 1
• Display current value		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...3A9A H 500...15000 dec.
• Upper frequency limit	5...150 Hz	F.O.	140	040	1021	01F4...3A9A H 500...15000 dec.

5.0 Example of serial interface communication with frequency controller REOVIB MFS 268

Variable values are written in *italics*.

5.1 Normal Operation

(set point set at 70 %)

Send set point	Word	Contents	Send	Contents	Receive
1		<i>B332 H</i>	Set point = 70 %	---	---
2					
3		<i>0004 H</i>	Enable ON	<i>A5xx H</i>	Ready

RS 232 Character string	<i>"B33200000004"+CR</i>	
RS 232 Character string		<i>"00000000A5xx"+CR</i>

(Control STOP)

Send Set point	Word	Contents	Send	Contents	Receive
1		<i>B332 H</i>	Set point = 70 %	---	---
2					
3		<i>0000 H</i>	Enable AUS	<i>A5xx H</i>	Ready

RS 232 Character string	<i>"B33200000000"+CR</i>	
RS 232 Character string		<i>"00000000A5xx"+CR</i>

5.2 Parameter Operation

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

Write enable	Word	Contents	Send	Contents	Receive
	1	C0DE H	Address write key	C0DE H	Confirmation
	2	B5E7 H	Value write key	B5E7 H	Confirmation
	3	8000 H + Control bits	Set Mode bit = 1	C0DE H	Confirmation

RS 232 Character string	"CODEB5E78000"+CR	
RS 232 Character string		"CODEB5E7COD"+CR

Write parameter	1	9005 H	Parameter address Frequency + R / W - Bit	9005 H	Confirmation
	2	1388H	Frequency 50 Hz	1388 H	Confirmation 50 Hz
	3	8000 H + Control bits	Set Mode bit = 1	C0DE H	Confirmation

RS 232 Character string	"900513888000"+CR	
RS 232 Character string		"90051388CODE"+CR

Write parameter	1	9013 H	Parameter address Soft start + R / W - Bit	9013 H	Confirmation
	2	3333 H	Soft start 2 secs.	3333 H	Confirmation 2 secs.
	3	8000 H + Control bits	Set Mode bit = 1	C0DE H	Confirmation

RS 232 Character string	"901333338002"+CR	
RS 232 Character string		"90133333CODE"+CR

Close write enable	Word	Contents	Send	Contents	Receive
	1	C0DE H	Adresss write key	C0DE H	Confirmation
	2	0000 H	Value write key	0000 H	Confirmation
	3	8000 H + Control Bits	Set Mode bit = 1	C0DE H	Confirmation

RS 232 Character string	"CODE00008000"+CR	
RS 232 Character string		"CODE0000CODE"+CR

(Parameter read only)

Read	Word	Contents	Send	Contents	Receive
	1	1013 H	Parameter address Soft start	1013 H	Confirmation
	2	0000 H	Read Parameter	8000 H	Parameter value (=> 5 Secs)
3	8000 H + Control bits	Set Mode bit = 1	C0DE H	Confirmation Parameter Mode	

RS 232 Character string	"101300008000"+CR	
RS 232 Character string		"10138000CODE"+CR

Example for changing bit parameter

Read Parameter	Word	Contents	Send	Contents	Receive
	1	1801 H	Parameter address	1801 H	Confirmation
	2	0000 H	Parameter read	0000 H	Parameter value
	3	8000 H + Control bits	Set Mode bit = 1	C0DE H	Confirmation parameter mode

RS 232 Character string	"180100008000"+CR	
RS 232 Character string		"18010000C0DE"+CR

Alter bit in chosen parameter

(e.g. Change bit 2 at address 1801 H auf "1" = Invert Enable).

Write enable	Word	Contents	Send	Contents	Receive
	1	C0DE H	Adress write key	C0DE H	Confirmation
	2	B5E7 H	Value write key	B5E7 H	Confirmation
	3	8000 H + Control bits	Set Mode bit = 1	C0DE H	Confirmation

RS 232 Character string	"C0DEB5E78000"+CR	
RS 232 Character string		"C0DEB5E7C0DE"+CR

Write parameter	Word	Contents	Send	Contents	Receive
	1	9801 H	Parameter address	9801 H	Confirmation
	2	0002 H	new Parameter	0002 H	Confirmation
	3	8000 H + Control bits	Set Mode bit = 1	C0DE H	Confirmation

RS 232 Character string	"980100028000"+CR	
RS 232 Character string		"98010002C0DE"+CR

Close write enable	Word	Contents	Send	Contents	Receive
	1	C0DE H	Adress write key	C0DE H	Confirmation
	2	0000 H	Value write key	0000 H	Confirmation
	3	8000 H + Control bits	Set Mode bit = 1	C0DE H	Confirmation

RS 232 Character string	"C0DE00008000"+CR	
RS 232 Character string		"C0DE0000C0DE"+CR

5.3 RESET of Controller

Write enable	Word	Contents	Send	Contents	Receive
	1	C0DE H	Adress write key	C0DE H	Confirmation
	2	B5C9 H	Value write key	B5C9 H	Confirmation
	3	8000 H + Control bits	Set Mode bit = 1	C0DE H	Confirmation

RS 232 Character string	"CODEB5C98000"+CR	
RS 232 Character string		"CODEBC97CODE"+CR

Write parameter	Word	Contents	Send	Contents	Receive
	1	9400 H	Parameter address Soft start + R / W - Bit	9400 H	Confirmation
	2	C009 H	RESET.	C009 H	
	3	8000 H + Control bits	Set Mode bit = 1	C0DE H	

RS 232 Character string	"9400C0098000"+CR	
RS 232 Character string		"9400C009CODE"+CR

RESET Allow approximately 0.5 seconds !