



VM15

Remote programming

Installer manual
VM15 – Remote programming

9UMEN1507-1200
Release: 220128

VM15 Remote programming

1. Introduction	1-3
1.1. Legend	1-3
1.2. Error codes.....	1-4
2. VM15 HMI Panel communication tables	2-5
2.1. Panel – General parameters	2-5
3. BALANCER [BN type] communication tables	3-7
3.1. Balancer – General parameters	3-8
3.2. Balancer – Plane A parameters	3-9
3.3. Balancer – Setup parameters	3-10
4. TOUCH DETECTOR [TD type] communication tables	4-13
4.1. Touch detector – General parameters	4-14
4.2. Touch detector – Sections programming	4-15
4.2.1. Part Program selection and programming method	4-15
4.2.2. Common definitions	4-16
4.2.3. Section A.....	4-17
4.3. Touch detector – V1..V2 variables	4-20
4.3.1. V1 Variable	4-21
4.3.2. V2 Variable	4-22
4.4. Touch detector – Power sensors	4-23
4.5. Touch detector – AE sensors.....	4-25
4.6. Touch detector – Analog output	4-26
4.7. Touch detector – Input / Output	4-27
5. GAUGE [AG type] communication tables.....	5-28
5.1. Gauge – General parameters table.....	5-28
5.2. Gauge – Section A Programming table.....	5-29
5.3. Gauge – Setup parameters table	5-35
5.4. Gauge – Roundness and shape data	5-37
5.5. Gauge – Section A: Part Program 1 parameters	5-38
6. GAUGE [NG type] communication tables	6-43
6.1. Gauge – General parameters table.....	6-43
6.2. Gauge – Section A Programming table.....	6-44
6.3. Gauge – Setup parameters table	6-50
6.4. Gauge – Roundness and shape data	6-51
6.5. Gauge – Section A: Part Program 1 parameters	6-52
7. Appendix.....	7-57

1. Introduction

1.1. Legend

Symbols definition	
Symbol	Description
LOW	LOW portion of an 16bit integer format (bit 0..7)
HIGH	HIGH portion of an 16bit integer format (bit 8..15)
HH32, MH32, ML32, LL32	MS byte to LS byte portion of 32bit integer (bit 32..24, 23..16,15..8 & 7..0)
BIT	Use as single bit
BYTE	Use as byte (8 bit, value 0..255)
R	Read only parameter
W	Write only parameter
RW	Read & Write parameter
000	Decimal value (dec)
00b	Binary value (bin)
00h	Hexadecimal value (hex)

1.2. Error codes

See document [Multinet](#) – Acyclic section.

2. VM15 HMI Panel communication tables

Device address		
Device	Address	
	Dec	Hex
Panel Vm15	112	70

Table No.		
Table	Table (16bit)	
	Dec	Hex
General parameters	0	00

2.1. Panel – General parameters

VM15 HMI Panel General parameter table							
Address		Portion	Rights	ID	Description	Default	Notes
Dec	Hex						
100	64	BYTE	RW		Displayed page		See table below

Displayed page	Value
BALANCER [type BN]	
Balancer – Plane A	120
TOUCH DETECTOR [type TD]	
Touch detector – Section A	41
GAUGE [type LG-RG-SG]	
Gauge – Section A	153
ABSOLUTE GAUGE [type AG]	
Gauge – Section A	60
ABSOLUTE GAUGE [type NG]	
Gauge – Section A	179

CUSTOM Pages	
Custom page No.1 – Viewer page ID 01	140
Custom page No.2 - Viewer page ID 02	141
Custom page No.3 - Viewer page ID 03	142
Custom page No.4 - Viewer page ID 04	143
Custom page No.5 - Viewer page ID 05	144
Custom page No.6 - Viewer page ID 06	145
Custom page No.7 - Viewer page ID 07	146
Custom page No.8 - Viewer page ID 08	147
Custom page No.9 – Viewer page ID 09	190
Custom page No.10 – Viewer page ID 10	191
Custom page No.11 – Viewer page ID 11	192
Custom page No.12 – Viewer page ID 12	193
Custom page No.13 – Viewer page ID 13	194
Custom page No.14 – Viewer page ID 14	195
Custom page No.15 – Viewer page ID 15	196
Custom page No.16 – Viewer page ID 16	197
SYSTEM Page	
System	112

VM15 HMI Panel							
General parameter table							
Address		Portion	Rights	ID	Description	Default	Notes
Dec	Hex						
99	63	BYTE	RW		Language		See table below

Displayed page	Value
Italian	1
English US	2
French	3
Spanisch	4
German	5
English GB	6
Portuguese	7
Russian	8
Chinese T	9
Chinese S	10
Japanese	11
Dutch	12
Swedish	13
Slovenian	14
Czech	15
Slovak	16
Romanian	17
Polish	18

3. BALANCER [BN type] communication tables

Device address		
Device	Address	
	Dec	Hex
Balancer	40	28

Table No.		
Table	Table (16bit)	
	Dec	Hex
General Parameters	0	00
Plane A	1	01
Setup	3	03

3.1. Balancer – General parameters

BALANCER					
General parameters – Table No. 0					
Address (16bit)		Portion	Rights	Description	Notes
Dec	Hex				
90	5a	BYTE	W	Internal commands	0 = no command 1= force parameters updating

NOTE

Send the internal command to the system “FORCE PARAMETERS UPDATE” after a write operation of new parameter values, in order to ensure a correct updating of the setup of the device involved.

3.2. Balancer – Plane A parameters

Offset to access the part-program parameters (value to be added to “Parameter Address”)		
Description	Dec	Hex
Part-Program 1	0	0

BALANCER Table 1 – Plane A parameters					
Address (16bit)		Portion	Rights	Description	Notes
Dec	Hex				
0	00	HIGH	RW	Minimum tolerance	0.001..10.000
1	01	LOW			
2	02	HIGH	RW	Maximum tolerance	0.001..10.000
3	03	LOW			
4	04	HIGH	RW	Intermediate tolerance	0.001..10.000
5	05	LOW			
6	06	HIGH	RW	Intermediate tolerance timeout [s]	0..250
7	07	LOW			
8	08	HIGH	RW	Maximum vibration	1..200
9	09	LOW			
10	0a	BYTE	RW	RPM stability check	0 = OFF 1 = ON
11	0b	BYTE	RW	Unbalance filter	0 = F64 1 = N64 2 = S64 3 = FF32 4 = F32 5 = N32 (default) 6 = S32 7 = N16 8 = N08
12	0c	BYTE	RW	Tolerance stability check	0 = OFF 1 = ON

3.3. Balancer – Setup parameters

BALANCER					
Table 3 – Setup parameters					
Address		Portion	Rights	Description	Notes
Dec	Hex				
0	0	BYTE	RW	Unbalance: measuring unit	0 = micron 1 = mm/s
9 10	09 0a	HIGH LOW	RW	Pickup 1: sensitivity	10..2000

BALANCER					
Table 3 – Setup parameters					
Address		Portion	Rights	Description	Notes
Dec	Hex				
30	1e	BYTE	RW	Synchronism source	0 = Internal (connector B4 – collector) 1 = External (connector B3 – sync) 2 = Software
31	1f	BYTE	RW	RPM stability check	0 = OFF 1 = ON
35 36 37 38	23 24 25 26	HIGH LOW	RW	Max rotation speed [n/min]	60..120.000
39 40 41 42	27 28 29 2a	HIGH LOW			
43 44 45 46	2b 2c 2d 2e	HIGH LOW			
47 48	2f 30	HIGH LOW			
49 50	31 32	HIGH LOW	RW	Timer for RPM stability check	0.0 .. 60.0
51 52 53 54	33 34 35 36	HIGH LOW	RW	Rotation speed while manual filter tuning [n/min]	60..30.000

BALANCER					
Table 3 – Setup parameters					
Address		Portion	Rights	Description	Notes
Dec	Hex				
70	46	BYTE	RW	Balancing head type	0 = Custom 1 = SDI-SDJ 2 = SHI-SHJ 3 = ...
71	47	BYTE	RW	Model (Custom balancing head)	0 = GTR 1 = SDI 2 = SDE 3 = GTA-X
72 73	48 49	HIGH LOW	RW	Driver voltage (Custom balancing head)	0..24.0
74 75	4a 4b	HIGH LOW	RW	Max voltage (Custom balancing head)	0..100
76 77	4c 4d	HIGH LOW	RW	Min voltage (Custom balancing head)	0..100
78 79	4e 4f	HIGH LOW	RW	Max current (Custom balancing head)	0..1000

BALANCER					
Table 3 – Setup parameters					
Address		Portion	Rights	Description	Notes
Dec	Hex				
119	77	BYTE	RW	Start balancing mode	0 = Max tolerance 1 = Min tolerance 2 = Intermediate tolerance
120	78	BYTE	RW	Power-up balancing	0 = OFF 1 = ON
121	79	BYTE	RW	Number of cycles counter	0..250
122 123	7a 7b	HIGH LOW	RW	Balancing cycle timeout	10..3600
128	80	BYTE	RW	Fine adjustment	0 = OFF 1 = ON 2 = OFF + HS 3 = ON + HS

BALANCER					
Setup 3 – Setup parameters – PLANE A					
Address		Portion	Rights	Description	Notes
Dec	Hex				
140		BYTE	RW	Machine stiffness	0 = custom 1 = 1 2 = 2 3 = 3 4 = 4 5 = 5 6 = default 7 = 7 8 = 8 9 = 9
141 142		HIGH LOW	RW	Min cross pulse [s] (Custom machine stiffness)	0.000..5.000
143 144		HIGH LOW	RW	Max cross pulse [s] (Custom machine stiffness)	0.000..20.000
145 146		HIGH LOW	RW	Cross voltage [V] (Custom machine stiffness)	0.0..24.0
147 148		HIGH LOW	RW	Min parallel pulse [s] (Custom machine stiffness)	0.000..5.000
149 150		HIGH LOW	RW	Max parallel pulse [s] (Custom machine stiffness)	0.000..20.000
151 152		HIGH LOW	RW	Parallel voltage [V] (Custom machine stiffness)	0.0..24.0

4. TOUCH DETECTOR [TD type] communication tables

Device address		
Device	Address	
	Dec	Hex
Touch Detector	88	58

Table No.		
Table	Table (16bit)	
	Dec	Hex
General parameters	0	00
Section A, Programming	1	01
Setup	4	04

4.1. Touch detector – General parameters

TOUCH DETECTOR					
General Parameter – Table No. 0					
Address		Portion	Rights	Description	Notes
Dec	Hex				
253	FD	BYTE	W	Internal commands	0 = no command 1 = force parameters update

NOTE

Send the internal command to the system “FORCE PARAMETERS UPDATE” after a write operation of new parameter values, in order to ensure a correct updating of the setup of the device involved.

4.2. Touch detector – Sections programming

4.2.1. Part Program selection and programming method

NOTE Program the parameters of a part program (example for Section A – Part-Program 3):

A) Select the part program by a “Section A, command”

- Optional task: Read and verify Section A, status == 0

200 (C8h) Section A, status

- Write command request part-program programming (see table)

202 (Cah) Section A, Part-Program = 2

201 (C9h) Section A, command = 16

B) Access to the tables of the parameters of the desiered part program (see belowe).

TOUCH DETECTOR Section A – Table No. 1					
Address		Portion	Rights	Description	Notes
Dec	Hex				
200	C8	BYTE	W	Section A, status	0 = ready Not 0 = busy
201	C9	BYTE	W	Section A, command	16 = Part-Program select
202	CA	BYTE	RW	Section A, Part-Program selected	0 = Part-Program 1 1 = Part-Program 2 2 = Part-Program 3 3 = Part-Program 4

4.2.2. Common definitions

Formula = OPERATOR programming = xxCCBBAA			
Symbol	Term	Bit	Description
XX	---	---	---
AA	1°	00b 01b	End of formula “.” OR next term “+”
BB	2°	00b 01b	End of formula “.” OR next term “+”
CC	3°	00b 01b	End of formula “.” OR next term “+”

Formula = terms programming (HIGH byte) = MMSTTxxx			
Symbol	Term	Bit	Description
MM	N, L, E	00b 01b 10b	Output signalling - No Latch (N) - Latch (L) - Edge (E)
S	<, >	0b 1b	Comparision - Lower than (<) - Greather than (>)
TT	a, d, i	00b 01b 10b	Source elaboration - Absolut (a) - Delta (d) - Incremental (i)
XX	---	---	---

Formula = Entity programming (LOW byte) = xxPPNNNN			
Symbol	Term	Bit	Description
XX	---	---	---
PP	-, V, P	00b 01b 10b 11b	Source - None - Variable (AE or AUX) - Power (P)
NNNN	1..8	0000b 0001b 0010b 0011b 0100b 0101b 0110b 0111b	Channel 1 Channel 2 Channel 3 Channel 4 Channel 5 Channel 6 Channel 7 Channel 8

4.2.3. Section A

TOUCH DETECTOR					
Section A Part-Program X – Table No. 1					
Address		Portion	Rights	Description	Notes
Dec	Hex				
000	00	BIT	RW	Formula Limit 1 = operator	See table below XxCCBBAA
001 002	01 02	HIGH LOW	RW RW	Formula Limit 1 = Term 1 definition	See table below MMSTTxxx XxPPNNNN
003 004	03 04	HIGH LOW	RW RW	Formula Limit 1 = Threshold 1	0.0..300.0
005 006	05 06	HIGH LOW	RW RW	Formula Limit 1 = Term 2 definition	See table below MMSTTxxx XxPPNNNN
007 008	07 08	HIGH LOW	RW RW	Formula Limit 1 = Threshold 2	0.0..300.0
009 010	09 0a	HIGH LOW	RW RW	Formula Limit 1 = Term 3 definition	See table below MMSTTxxx XxPPNNNN
011 012	0b 0c	HIGH LOW	RW RW	Formula Limit 1 = Threshold 3	0.0..300.0
013 014	0d 0e	HIGH LOW	RW RW	Formula Limit 1 = Term 4 definition	See table below MMSTTxxx XxPPNNNN
015 016	0f 10	HIGH LOW	RW RW	Formula Limit 1 = Threshold 4	0.0..300.0
017	11	BIT	RW	Formula Limit 2 = operator	See table below XxCCBBAA
018 019	12 13	HIGH LOW	RW RW	Formula Limit 2 = Term 1 definition	See table below MMSTTxxx XxPPNNNN
020 021	14 15	HIGH LOW	RW RW	Formula Limit 2 = Threshold 1	0.0..300.0
022 023	16 17	HIGH LOW	RW RW	Formula Limit 2 = Term 2 definition	See table below MMSTTxxx XxPPNNNN
024 025	18 19	HIGH LOW	RW RW	Formula Limit 2 = Threshold 2	0.0..300.0
026 027	1a 1b	HIGH LOW	RW RW	Formula Limit 2 = Term 3 definition	See table below MMSTTxxx XxPPNNNN
028 029	1c 1d	HIGH LOW	RW RW	Formula Limit 2 = Threshold 3	0.0..300.0
030 031	1e 1f	HIGH LOW	RW RW	Formula Limit 2 = Term 4 definition	See table below MMSTTxxx XxPPNNNN
032 033	20 21	HIGH LOW	RW RW	Formula Limit 2 = Threshold 4	0.0..300.0
034	22	BIT	RW	Formula Limit 3 = operator	See table below xxxxxxAA
035 036	23 24	HIGH LOW	RW RW	Formula Limit 3 = Term 1 definition	vedi Table sotto MMSTTxxx XxPPNNNN
037 038	25 26	HIGH LOW	RW RW	Formula Limit 3 = Threshold 1	0.0..300.0

TOUCH DETECTOR					
Section A Part-Program X – Table No. 1					
Address		Portion	Rights	Description	Notes
Dec	Hex				
039 040	27 28	HIGH LOW	RW RW	Formula Limit 3 = Term 2 definition	See table below MMSTTxxx XxPPNNNN
041 042	29 2a	HIGH LOW	RW RW	Formula Limit 3 = Threshold 2	0.0..300.0
043	2b	BIT	RW	Formula Limit 4 = operator	See table below xxxxxxAA
044 045	2c 2d	HIGH LOW	RW RW	Formula Limit 4 = Term 1 definition	See table below MMSTTxxx XxPPNNNN
046 047	2e 2f	HIGH LOW	RW RW	Formula Limit 4 = Threshold 1	0.0..300.0
048 049	30 31	HIGH LOW	RW RW	Formula Limit 4 = Term 2 definition	See table below MMSTTxxx XxPPNNNN
050 051	32 33	HIGH LOW	RW RW	Formula Limit 4 = Threshold 2	0.0..300.0
052	34	BYTE	RW	Reset delay	0.0 .. 25.5
053 054	35 36	HIGH LOW	RW RW	Limit 1 activation delay [ms]	0 .. 32000
055 056	37 38	HIGH LOW	RW RW	Limit 2 activation delay [ms]	0 .. 32000
057 058	39 3a	HIGH LOW	RW RW	Limit 3 activation delay [ms]	0 .. 32000
059 060	3b 3c	HIGH LOW	RW RW	Limit 4 activation delay [ms]	0 .. 32000

TOUCH DETECTOR					
Section A Part-Program X – Table No. 1					
Address		Portion	Rights	Description	Notes
Dec	Hex				
061	3d	BYTE	RW	Incremental mode	0 = incremental 1 = static offset
062 063	3e 3f	HIGH LOW	RW RW	V1 offset	0 .. 32000
064 065	40 41	HIGH LOW	RW RW	V2 offset	0 .. 32000
066 067	42 43	HIGH LOW	RW RW	V3 offset	0 .. 32000
068 069	44 45	HIGH LOW	RW RW	V4 offset	0 .. 32000
070 071	46 47	HIGH LOW	RW RW	P offset	0 .. 32000

ENVELOPE					
Section A Part-Program X – Table No. 1					
Address		Portion	Rights	Description	Notes
Dec	Hex				
072 073	48 49	HIGH LOW	RW	Envelope programming	bit 00: Envelope (0= OFF/1=ON) bit 01: Self learning process duration (0= OFF/1=ON) bit 02 to 10: N.A. bit 11: Instantaneous crash limit mode (0= No Latch / 1=Latch) bit 12: Instantaneous min limit mode (0= No Latch / 1=Latch) bit 13: Instantaneous max limit mode (0= No Latch / 1=Latch) bit 14: Mode min shape limit (0= No Latch / 1=Latch) bit 15: Mode max shape limit (0= No Latch / 1=Latch)
074	4a	BYTE	RW	Envelope source	{0..4} = {v1,v2,v3,v4,P} (PA o PB)
075	4b	BYTE	RW	% zone overlapping	0 .. 100[%]
076	4c	BYTE	RW	No. of zones	{0..4} = {16,32,64,128,256}
077 078	4d 4e	HIGH LOW	RW	Process duration [0.1s]	4.0..6500.0 sec
079	4f	BYTE	RW	No. of averages	1..20
080 081	50 51	HIGH LOW	RW	% for calculation max. curve [0.1%]	0.0 .. 200.0[%]
082 083	52 53	HIGH LOW	RW	% for calculation near min. curve [0.1%]	0.0 .. 200.0[%]
084 085	54 55	HIGH LOW	RW	% for calculation min. curve [0.1%]	0.0 .. 200.0[%]
086 087	56 57	HIGH LOW	RW	Ignore signal level [0.1%]	0.0 .. 200.0[%]
088 089	58 59	HIGH LOW	RW	IP max limit [0.1%]	0.0 .. 200.0[%]
090 091	5a 5b	HIGH LOW	RW	IP min limit [0.1%]	0.0 .. 200.0[%]
092 093	5c 5d	HIGH LOW	RW	IP crash limit [0.1%]	0.0 .. 200.0[%]
094 095	5e 5f	HIGH LOW	RW	Process timeout [0.1s]	0.0..6500.0 sec
096 097	60 61	HIGH LOW	RW	Autostart programming	00000000b = OFF 00000001b = L1 00000010b = L2 00000011b = L3 00000100b = L4 00000101b = EXT
098 099	62 63	HIGH LOW	RW	Autostart timeout [0.1s]	0.0..6500.0 sec

4.3. Touch detector – V1..V2 variables

The following parameters are available for the active SETUP No. only.

1. The correct SETUP No. must be selected and activated.
2. Refer to the following table to access the Gain A and B of the variables (V1..V2) of the active setup.

TOUCH DETECTOR Table No. 6					
Address		Portion	Rights	Description	Notes
Dec	Hex				
9	09	BYTE	R	Active setup	0.. = { Setup n.0 }

IMPORTANT FOR THE NEXT PARAGRAPHS

(*) Depending on hardware configuration.

NOTE: the association "Variable to function card" is fixed on the code.
The association "AE channel (1...2) to Variable" is programmable.

To activate the modifications two internal command are required in sequence. See below.

TOUCH DETECTOR Table No. 0					
Address		Portion	Rights	Description	Notes
Dec	Hex				
253	fd	BYTE	W	Force variable programming	1 – force programming

NOTE: wait 200ms after modification to allow the hardware adjustment.

4.3.1. V1 Variable

TOUCH DETECTOR – V1 variable					
Table No. 6					
Address		Portion	Rights	Description	Notes
Dec	Hex				
10 11	0a 0b	HIGH LOW	RW	Fullscale	0.00 .. 300.00
12	0c	BYTE	RW	RMS filter	0 .. 255
13	0d	BYTE	RW	Gain B	0..7 or 0..1 (*)
14	0e	BYTE	RW	No. of samples for HW RMS	0=OFF, 2..175
15	0f	BYTE	RW	RMS Down-sample	{0..8} = {1,2,4,8,16,32,65,128,256}
16	10	BYTE	RW	Digital filters type	0 = Digital filters OFF 1 = 1 band pass filter 2 = 2 band pass filters
17	11	BYTE	RW	Band pass No. 1 Low cursor	0 .. 49
18	12	BYTE	RW	Band pass No. 1 High cursor	0 .. 49
19	13	BYTE	RW	Band pass No. 2 Low cursor	0 .. 49
20	14	BYTE	RW	Band pass No. 2 High cursor	0 .. 49
70	46	BYTE	RW	Source	0 = AE1 1 = AE1-20dB 2 = AE2 3 = AE2-20dB 4 = AE3 5 = AE3-20dB 6 = AE4 7 = AE4-20dB 8 = AUX 9 = AUX-20dB 10 = AUX-LP 11 = AUX-HP
71	47	BYTE	RW	Programming	Bit 0: Band killer 0=OFF, 1 =ON Bit 1: High pass 0=OFF, 1 = ON Bit 2: Band pass 0=OFF, 1 = ON Bit 7: Analog Filter bypass 0=OFF 1= ON
72 73	48 49	HIGH LOW	RW	Band killer low cursor	45..721
74 75	4a 4b	HIGH LOW	RW	Band killer high cursor	81..952
76 77	4c 4d	HIGH LOW	RW	High pass cursor	1..51
80	50	BYTE	RW	Gain A	0 .. 255
81 82	51 52	HIGH LOW	RW	Band pass low cursor	46..833
83 84	53 54	HIGH LOW	RW	Band pass high cursor	82..976
85	55	BYTE	RW	Window	0..20

4.3.2. V2 Variable

TOUCH DETECTOR – V2 variable					
Table No. 6					
Address		Portion	Rights	Description	Notes
Dec	Hex				
25 26	19 1a	HIGH LOW	RW	Fullscale	0.00 .. 300.00
27	1b	BYTE	RW	RMS filter	0 .. 255
28	1c	BYTE	RW	Gain B	0..7 or 0..1 (*)
29	1d	BYTE	RW	No. of samples for HW RMS	0=OFF, 2..175
30	1e	BYTE	RW	RMS Down-sample	{0..8} = {1,2,4,8,16,32,65,128,256}
31	1f	BYTE	RW	Digital filters type	0 = Digital filters OFF 1 = 1 band pass filter 2 = 2 band pass filters
32	20	BYTE	RW	Band pass No. 1 Low cursor	0 .. 49
33	21	BYTE	RW	Band pass No. 1 High cursor	0 .. 49
34	22	BYTE	RW	Band pass No. 2 Low cursor	0 .. 49
35	23	BYTE	RW	Band pass No. 2 High cursor	0 .. 49
86	56	BYTE	RW	Source	0 = AE1 1 = AE1-20dB 2 = AE2 3 = AE2-20dB 4 = AE3 5 = AE3-20dB 6 = AE4 7 = AE4-20dB 8 = AUX 9 = AUX-20dB 10 = AUX-LP 11 = AUX-HP
87	57	BYTE	RW	Programming	Bit 0: Band killer 0=OFF, 1 =ON Bit 1: High pass 0=OFF, 1 = ON Bit 2: Band pass 0=OFF, 1 = ON Bit 7: Analog Filter bypass 0=OFF 1= ON
88 89	58 59	HIGH LOW	RW	Band killer low cursor	45..721
90 91	5a 5b	HIGH LOW	RW	Band killer high cursor	81..952
92 93	5c 5d	HIGH LOW	RW	High pass cursor	1..51
96	60	BYTE	RW	Gain A	0 .. 255
97 98	61 62	HIGH LOW	RW	Band pass low cursor	46..833
99 100	63 64	HIGH LOW	RW	Band pass high cursor	82..976
101	65	BYTE	RW	Window	0..20

4.4. Touch detector – Power sensors

TOUCH DETECTOR Table No. 4					
Address		Portion	Rights	Description	Notes
Dec	Hex				
20 21	14 15	HIGH LOW	RW RW	Power 1 - Fullscale	0..300.0
22	16	BYTE	RW	Power 1 – RMS filter	0..255
23 24	17 18	HIGH LOW	RW RW	Power 2 - Fullscale	0..300.0
25	19	BYTE	RW	Power 2 – RMS filter	0..255
26 27	1a 1b	HIGH LOW	RW RW	Power 3 - Fullscale	0..300.0
28	1c	BYTE	RW	Power 3 – RMS filter	0..255
29 30	1d 1e	HIGH LOW	RW RW	Power 4 - Fullscale	0..300.0
31	1f	BYTE	RW	Power 4 – RMS filter	0..255
32 33	20 21	HIGH LOW	RW RW	Power 5 - Fullscale	0..300.0
34	22	BYTE	RW	Power 5 – RMS filter	0..255
35 36	23 24	HIGH LOW	RW RW	Power 6 - Fullscale	0..300.0
37	25	BYTE	RW	Power 6 – RMS filter	0..255
38 39	26 27	HIGH LOW	RW RW	Power 7 - Fullscale	0..300.0
40	28	BYTE	RW	Power 7 – RMS filter	0..255
41 42	29 2a	HIGH LOW	RW RW	Power 8 - Fullscale	0..300.0
43	2b	BYTE	RW	Power 8 – RMS filter	0..255
44	2c	BYTE	RW	Power 1 – Down-sample	{0..8} = {1,2,4,8,16,32,65,128,256}
45	2d	BYTE	RW	Power 2 – Down-sample	{0..8} = {1,2,4,8,16,32,65,128,256}
46	2e	BYTE	RW	Power 3 – Down-sample	{0..8} = {1,2,4,8,16,32,65,128,256}
47	2f	BYTE	RW	Power 4 – Down-sample	{0..8} = {1,2,4,8,16,32,65,128,256}
48	30	BYTE	RW	Power 5 – Down-sample	{0..8} = {1,2,4,8,16,32,65,128,256}
49	31	BYTE	RW	Power 6 – Down-sample	{0..8} = {1,2,4,8,16,32,65,128,256}
50	32	BYTE	RW	Power 7 – Down-sample	{0..8} = {1,2,4,8,16,32,65,128,256}
51	33	BYTE	RW	Power 8 – Down-sample	{0..8} = {1,2,4,8,16,32,65,128,256}

To activate the modifications two internal command are required in sequence. See below.

TOUCH DETECTOR Table No. 0					
Address		Portion	Rights	Description	Notes
Dec	Hex				
253	fd	BYTE	W	Force variable programming	1 – force programming 16 – setup change

NOTE: wait 200ms after modification to allow the hardware adjustment.

4.5. Touch detector – AE sensors

TOUCH DETECTOR Table No. 4					
Address		Portion	Rights	Description	Notes
Dec	Hex				
70	46	BYTE	RW	AE1 programming	bit 0: Icp 0=OFF, 1=ON bit 1: Sensor ready 0=OFF, 1 =ON
71	47	HIGH	RW	AE1 sensor ready limit	0..100.0
72	48	LOW	RW		
73	49	BYTE	RW	AE2 programming	bit 0: Icp 0=OFF, 1=ON bit 1: Sensor ready 0=OFF, 1 =ON
74	4a	HIGH	RW	AE2 sensor ready limit	0..100.0
75	4b	LOW	RW		
76	4c	BYTE	RW	AE3 programming	bit 0: Icp 0=OFF, 1=ON bit 1: Sensor ready 0=OFF, 1 =ON
77	4d	HIGH	RW	AE3 sensor ready limit	0..100.0
78	4e	LOW	RW		
79	4f	BYTE	RW	AE4 / AUX programming	bit 0: Icp 0=OFF, 1=ON bit 1: Sensor ready 0=OFF, 1 =ON
80	50	HIGH	RW	AE4 / AUX sensor ready limit	0..100.0
81	51	LOW	RW		

To activate the modifications two internal command are required in sequence. See below.

TOUCH DETECTOR Table No. 0					
Address		Portion	Rights	Description	Notes
Dec	Hex				
253	fd	BYTE	W	Force variable programming	1 – force programming 16 – setup change

NOTE: wait 200ms after modification to allow the hardware adjustment.

4.6. Touch detector – Analog output

TOUCH DETECTOR Table No. 4					
Address		Portion	Rights	Description	Notes
Dec	Hex				
110	6e	BYTE	RW	A.O. Source	0 = V1 1 = V2 2 = V3 3 = V4 4 = PA 5 = PB 6 = PC 7 = PD
111 112	6f 70	HIGH LOW	RW RW	A.O. Fullscale	0..300.0
113	71	BYTE	RW	A.O. Peak detector [ms]	0..2000

To activate the modifications two internal command are required in sequence. See below.

TOUCH DETECTOR Table No. 0					
Address		Portion	Rights	Description	Notes
Dec	Hex				
253	fd	BYTE	W	Force variable programming	1 – force programming

NOTE: wait 200ms after modification to allow the hardware adjustment.

4.7. Touch detector – Input / Output

TOUCH DETECTOR Table No. 4					
Address		Portion	Rights	Description	Notes
Dec	Hex				
000	00	BYTE	RW	Reset mode	0 = Edge 1 = Status 2 = Status + test
001	01	BYTE	RW	Minimum activation time of the outputs [ms]	0 .. 250
010 011	0a 0b	HIGH LOW	RW	Peak detection (display) [ms]	0 .. 32000
014	0e	BYTE	RW	Handshake mode	0 = OFF 1 = ON

TOUCH DETECTOR – D2 Connector Table No. 4					
Address		Portion	Rights	Description	Notes
Dec	Hex				
120	78	BYTE	RW	Input D2.pin 1	0 = Section A Limits 1, 2, 3, 4 reset
121	79	BYTE	RW	Input D2.pin 2	0 = Select + Enable 1 = Automatic mode (switch & lock) 2 = Section B Limits 1, 2, 3, 4 reset
122	7a	BYTE	RW	Output D2.pin 4	0 = Section A Limit 1 signaling
123	7b	BYTE	RW	Output D2.pin 5	0 = Section A Limit 2 signaling 1 = Section B Limit 1 signaling 2 = Generic alarm 3 = Echo select (& data valid) 4 = Cycle A in-progress
124	7c	BYTE	RW	Output D2.pin 6	0 = Section A Limit 3 signaling 1 = Section B Limit 1 signaling 2 = Section C Limit 1 signaling 3 = Automatic mode 4 = Cycle A in-progress
125	7d	BYTE	RW	Output D2.pin 7	0 = Section A Limit 4 signaling 1 = Section B Limit 2 signaling 2 = Section D Limit 1 signalling 3 = Automatic mode 4 = Echo select (& data valid) 5 = Cycle A in-progress 6 = Reset A in-progress

5. GAUGE [AG type] communication tables

Device address		
Device	Device address	
	Dec	Hex
Absolute Gauge	53	35

Table No.		
Table	Table (16bit)	
	Dec	Hex
General parameters	0	00
Section A Programming	1	01
Setup	4	04
Roundness and shape data	7	07
Section A – Part program 1	100	64

5.1. Gauge – General parameters table

GAUGE General parameters					
Address		Portion	Rights	Description	Notes
Dec	Hex				
021 022	15 16	HIGH LOW	R	Software version	
023 024	17 18	HIGH LOW	R	Software Revision	
200 201 202 203	c8 c9 ca cb	HH32 MH32 ML32 LL32	R	Master diameter	0.0000 ... 500.0000 [mm]

GAUGE General parameters: Internal commands					
Address		Portion	Rights	Description	Notes
Dec	Hex				
090	5a	BYTE	W	Internal commands	0 = no command 1 = force parameters update

NOTE

Send the internal command to the system “FORCE PARAMETERS UPDATE” after a write operation of new parameter values, in order to ensure a correct updating of the setup of the device involved.

5.2. Gauge – Section A Programming table

GAUGE					
Section A and B Programming – Section Parameters					
Address		Portion	Rights	Description	Notes
Dec	Hex				
200	c8	BYTE	RW	Freeze last dimension	0 = OFF 1 = ON
201 202	c9 ca	HIGH LOW	R/W	Dwell timeout (sparkout)	-0.1 ... 1000.0 [s] (-0.1 = disable)
203 204	cb cc	HIGH LOW	R/W	Offset increment step	0.0001 ... 3.2000 [mm]

GAUGE					
Section A: Part-Program selection					
Address		Portion	Rights	Description	Notes
Dec	Hex				
248	f8	BYTE	W	Section command	240 = Part-Program 1 241 = Part-Program 2 ... 247 = Part-Program 8
249	f9	BYTE	R	Part-Program selected for programming	
250	fa	BYTE	R	Commands state	

NOTE Program the parameters of a part program:

A) Select the part program by a “Section command”

- Read and verify command status == 0

250 (FAh) Commands state

- Write command request part-program programming (see table)

248 (F8h) Section command

Commands for Part-Program selection		
Command		Part-Program
Dec	Hex	
240	f0	1
241	f1	2
242	f2	3
243	f3	4
244	f4	5
245	f5	6
246	f6	7
247	f7	8

B) Wait and verify the correct part program selection checking that the parameter

249 (F9h) Part program selected for programming

assumed the requested value (contained into the command).

C) Access to the tables of the parameters of the desidered part program (see below).

GAUGE					
Section A and B Programming: Part Program - gauging parameters					
Address		Portion	Rights	Description	Notes
Dec	Hex				
000 001	00 01	HIGH LOW	RW	Gauging cycle start delay	0.0 .. 100.0 [s]
002 003	02 03	HIGH LOW	RW	Remaining traverse time	0.0 .. 100.0 [s]
004 005	04 05	HIGH LOW	RW	Master deviation from zero	-1.0000 .. +1.0000 [mm]
006 007	06 07	HIGH LOW	RW	Formula: Transducer G2 coeff.	-10.000 .. +10.000
008 009	08 09	HIGH LOW	RW	Formula: Transducer G3 coeff.	-10.000 .. +10.000
010 011	0a 0b	HIGH LOW	RW	Formula: Transducer G4 coeff.	-10.000 .. +10.000
012 013	0c 0d	HIGH LOW	RW	Formula: Transducer G5 coeff.	-10.000 .. +10.000
014 015	0e 0f	HIGH LOW	RW	Formula: Finger ratio	-10.000 .. +10.000

GAUGE					
Section A: Part Program - gauging parameters					
Address		Portion	Rights	Description	Notes
Dec	Hex				
016 017	10 11	HIGH LOW	RW	Offset	-3.2000 .. +3.2000 [mm]
018 019 020 021	12 13 14 15	HH32 MH32 ML32 LL32	RW	Nominal dimension	0.0000 ... 500.0000 [mm]
022 023 024 025	16 17 18 19	HH32 MH32 ML32 LL32	RW	Rest dimension	0.0000 ... 500.0000 [mm]
026	1a	BYTE	RW	Gauge mode	0 = In-process 1 = Post-process
027	1b	BYTE	RW	Synchronism	0 = OFF 1 = Synchronism 1 2 = Synchronism 2 3 = Software 4 = G2 5 = G3 6 = G4 7 = G5 8 = Dimension
028	1c	BYTE	RW	Gauge mode (if synchro)	0 = continue 1 = max 2 = min 3 = average
029 030	1d 1e	HIGH LOW	RW	Mechanical delay	0.0 .. 360.0 [deg]
031 032	1f 20	HIGH LOW	RW	Sampling sector	0.0 .. 360.0 [deg]
033 034	21 22	HIGH LOW	RW	Electrical delay	0.0 .. 360.0 [deg]
038	26	BYTE	RW	Timer for dimension stability	0.0 .. 25.0 [s]
039 040	27 28	HIGH LOW	RW	Tolerance valid dimension	0 .. 1.000 [mm]
045	2d	BYTE	RW	Synchronized Zeroing	0=OFF 1=ON
046	2e	BYTE	RW	Measure Type	0 = Normal 1 = Absolute
047	2f	BYTE	RW	Workpiece profile	0 = Plain (continuous) 1 = Even 2 = Odd
048	30	BYTE	RW	Damping	0 .. 5
049 050	31 32	HIGH LOW	RW	Workhead rpm	1 .. 30000
051	33	BYTE	RW	Operating mode	0 = start 1 = start + stop
052	34	BYTE	RW	Activation edge	0 = positive 1 = negative
053 054	35 36	HIGH LOW	RW	Start threshold	-32.000 .. 32.000
055 056	37 38	HIGH LOW	RW	Stop threshold	-32.000 .. 32.000

GAUGE					
Section A: Part Program - gauging parameters					
Address		Portion	Rights	Description	Notes
Dec	Hex				
057	39	BYTE	RW	Time base	0 = Time 1 = Sync software 2 = Sync 1 3 = Sync 2
058 059	3a 3b	HIGH LOW	RW	Mechanical delay	0 .. 65535 [ms]
060 061	3c 3d	HIGH LOW	RW	Electrical delay	0 .. 65535 [ms]
062 063	3e 3f	HIGH LOW	RW	Sampling sector	0 .. 65535 [ms]
064 065	40 41	HIGH LOW	RW	Blanking time	0.0 .. 360.0 [deg]
066 067	42 43	HIGH LOW	RW	Blanking time	0 .. 65535 [ms]
100	64	BYTE	RW	Limit Type	0 = Relative 1 = Absolute
101 102 103 104	65 66 67 68	HH32 MH32 ML32 LL32	RW	Limit 4	-500.000..+500.000 [mm]
105 106 107 108	69 6a 6b 6c	HH32 MH32 ML32 LL32	RW	Limit 3	-500.000..+500.000 [mm]
109 110 111 112	6d 6e 6f 70	HH32 MH32 ML32 LL32	RW	Limit 2	-500.000..+500.000 [mm]
113 114 115 116	71 72 73 74	HH32 MH32 ML32 LL32	RW	Limit 1	-500.000..+500.000 [mm]
117 118 119 120	75 76 77 78	HH32 MH32 ML32 LL32	RW	Limit 0	-500.000..+500.000 [mm]
121 122 123 124	79 7a 7b 7c	HH32 MH32 ML32 LL32	RW	Limit A	-500.000..+500.000 [mm]

GAUGE					
Section A: Part Program - Roundness parameters					
Address		Portion	Rights	Description	Notes
Dec	Hex				
150	96	BYTE	RW	Roundness analysis	0 = OFF 1 = ON
151	97	BIT	RW	Deviation center Synchronism	CxSx xxxx bit 7: 0 = theoretical, 1 = real bit 5: 0 = Sync 1, 1 = Sync2
152	98	BYTE	RW	Transducer	0 = G2 1 = G3 2 = G4 3 = G5
153 154	99 9a	HIGH LOW	RW	Transducer coefficient	-10.000 .. +10.000
155	9b	BYTE	RW	Component to calculate residual	0 .. 63
156	9c	BIT	RW	Formula: Limit 1 - 1 st term : Entity Operator	Bit 3..0 : 0 = none 1 = Internal deviation 2 = External deviation 3 = Excentricity 4 = Ovality 5 = 3-lobe 6 = 4-lobe 7 = 5-lobe 8 = Residual Bit 4: 0 = ':' (end) 1 = '+'
157	9d	BIT	RW	Formula: Limit 1 - 2 nd term : Entity	Bit 3..0 : 0 = none 1 = Internal deviation 2 = External deviation 3 = Excentricity 4 = Ovality 5 = 3-lobe 6 = 4-lobe 7 = 5-lobe 8 = Residual
158	9e	BIT	RW	formula: Limit 2 : Entity	Bit 3..0 : 0 = none 1 = Internal deviation 2 = External deviation 3 = Excentricity 4 = Ovality 5 = 3-lobe 6 = 4-lobe 7 = 5-lobe 8 = Residual
159	9f	BIT	RW	Formula: Limit 3 : Entity	Bit 3..0 : 0 = none 1 = Internal deviation 2 = External deviation 3 = Excentricity 4 = Ovality 5 = 3-lobe 6 = 4-lobe 7 = 5-lobe 8 = Residual

GAUGE					
(... continue) Section A: Part Program - Roundness parameters					
Address		Portion	Rights	Description	Notes
160	a0	HH32	RW	Formula: Limit 1 - 1 st term Limit value	-3.2000..+ 3.2000
161	a1	MH32			
162	a2	ML32			
163	a3	LL32			
164	a4	HH32	RW	Formula: Limit 1 – 2 nd term Limit value	-3.2000..+ 3.2000
165	a5	MH32			
166	a6	ML32			
167	a7	LL32			
168	a8	HH32	RW	Formula: Limit 2 Limit value	-3.2000..+ 3.2000
169	a9	MH32			
170	aa	ML32			
171	ab	LL32			
172	ac	HH32	RW	Formula: Limit 3 Limit value	-3.2000..+ 3.2000
173	ad	MH32			
174	ae	ML32			
175	af	LL32			

5.3. Gauge – Setup parameters table

GAUGE Setup: General setup					
Address		Portion	Rights	Description	Notes
Dec	Hex				
003	03	BYTE	RW	Reset mode	0 = START 1 = ENABLE
008	08	BYTE	RW	Sync 1: No. of references per revolution	1..24
009 010	09 0a	HIGH LOW	RW	Sync 1: Minimum part rpm	0..1200
011	0b	BYTE	RW	Sync 2: No. of references per revolution	1..24
012 013	0c 0d	HIGH LOW	RW	Sync 2: Minimum part rpm	0..1200

Offset to access the device parameters (value to be added to parameter “Address”)		
Transducer n.	Dec	Hex
Transducer G2	0	0
Transducer G3	40	28
Transducer G4	80	50
Transducer G5	120	78

GAUGE Setup: Transducer G2 parameters					
Address		Portion	Rights	Description	Notes
Dec	Hex				
030 031	1E 1F	HIGH LOW	RW	Gauging RMS filter	0..400
033	21	BYTE	RW	Trasducer type	0 = Custom 1 = TG 2 = TG200-LG
034 035	22 23	HIGH LOW	RW	Transducer sensitivity [mV/mm/V]	-300.0..300.0 (Custom and TG Type)
036 037	24 25	HIGH LOW	RW	Minimum dimension	-32.000 .. 32.000
038 039	26 27	HIGH LOW	RW	Maximum dimension	-32.000 .. 32.000
040	28	BYTE	RW	Retraction control	0 = OFF 1 = ON
041 042	29 2A	HIGH LOW	RW	Roundness RMS filter	0..400
043 044	2B 2C	HIGH LOW	RW	Upper overrange	-32.000 .. 32.000
047 048	2F 30	HIGH LOW	RW	Energizing voltage [V]	0.0..10.5 (Custom and TG Type)
049 050	31 32	HIGH LOW	RW	TG200-LG: Energizing voltage [V]	0.0..10.5
051 052	33 34	HIGH LOW	RW	TG200-LG: Transducer sensitivty [mV/mm/V]	-300.0..300.0
055 056	37 38	HIGH LOW	RW	Lower overrange	-32.000 .. 32.000
057 058	39 3A	HIGH LOW	RW	Retraction dimension	-32.000 .. 32.000

5.4. Gauge – Roundness and shape data

GAUGE Roundness and shape data – Section A					
Address		Portion	Rights	Description	Notes
Dec	Hex				
000 001	00 01	HIGH LOW	R	Internal deviation	Resolution 0.1 μ m
002 003	02 03	HIGH LOW	R	External deviation	Resolution 0.1 μ m
004 005	04 05	HIGH LOW	R	Runout	Resolution 0.1 μ m
006 007	06 07	HIGH LOW	R	Excentricity	Resolution 0.1 μ m
008 009	08 09	HIGH LOW	R	Ovality	Resolution 0.1 μ m
010 011	0a 0b	HIGH LOW	R	3 – lobe	Resolution 0.1 μ m
012 013	0c 0d	HIGH LOW	R	4 – lobe	Resolution 0.1 μ m
014 015	0e 0f	HIGH LOW	R	5 – lobe	Resolution 0.1 μ m
016 017	10 11	HIGH LOW	R	Residual	Resolution 0.1 μ m

5.5. Gauge – Section A: Part Program 1 parameters

GAUGE					
Table No. 100 - Section A: Part Program 1 parameters					
Address		Portion	Rights	Description	Notes
Dec	Hex				
000 001	00 01	HIGH LOW	RW	Formula: Transducer G2 coeff.	-10.000 .. +10.000
002 003	02 03	HIGH LOW	RW	Formula: Transducer G3 coeff.	-10.000 .. +10.000
004 005	04 05	HIGH LOW	RW	Formula: Transducer G4 coeff.	-10.000 .. +10.000
006 007	06 07	HIGH LOW	RW	Formula: Transducer G5 coeff.	-10.000 .. +10.000
008 009	08 09	HIGH LOW	RW	Formula: Gain coeff	-10.000 .. +10.000
010	0a	BYTE	RW	Gauge mode (if synchro)	0 = continue 1 = max 2 = min 3 = average
011	0b	BYTE	RW	Synchronism	0 = OFF 1 = Synchronism 1 2 = Synchronism 2
012 013	0c 0d	HIGH LOW	RW	Mechanical delay	0 .. 360.0 [deg]
014 015	0e 0f	HIGH LOW	RW	Sampling sector	0 .. 360.0 [deg]
016 017	10 11	HIGH LOW	RW	Electrical delay	0 .. 360.0 [deg]
018	12	BYTE	RW	Synchronized Zeroing	0=OFF 1=ON
019 020 021 022	13 14 15 16	HH32 MH32 ML32 LL32	RW	Nominal dimension	0.0000 ... 500.0000 [mm]
023 024 025 026	17 18 19 1a	HH32 MH32 ML32 LL32	RW	Rest dimension	0.0000 ... 500.0000 [mm]
027	1b	BYTE	RW	Measure Type	0 = Normal 1 = Absolute
028	1c	BYTE	RW	Gauge mode	0 = In-process 1 = Post-process
029 030	1d 1e	HIGH LOW	RW	Gauging cycle start delay	0.0 .. 100.0 [s]
031 032	1f 20	HIGH LOW	RW	Remaining traverse time	0.0 .. 100.0 [s]
033 034	21 22	HIGH LOW	RW	Master deviation from zero	-1.0000 .. +1.0000 [mm]
035 036	23 24	HIGH LOW	RW	Offset	-3.2000 .. +3.2000 [mm]
037	25	BYTE	RW	Timer for dimension stability	0 .. 25.0 [s]
038 039	26 27	HIGH LOW	RW	Tolerance valid dimension	0 .. 1.000 [mm]
040 041 042 043	28 29 2a 2b	HH32 MH32 ML32 LL32	RW	Electrical zero	[nm]

GAUGE					
Table No. 100 - Section A: Part Program 1 parameters					
Address		Portion	Rights	Description	Notes
Dec	Hex				
044	2c	BYTE	RW	Limit Type	0 = Relative 1 = Absolute
045 046 047 048	2d 2e 2f 30	HH32 MH32 ML32 LL32	RW	Limit 4	-500.000..+500.000 [mm]
049 050 051 052	31 32 33 34	HH32 MH32 ML32 LL32	RW	Limit 3	-500.000..+500.000 [mm]
053 054 055 056	35 36 37 38	HH32 MH32 ML32 LL32	RW	Limit 2	-500.000..+500.000 [mm]
057 058 059 060	39 3a 3b 3c	HH32 MH32 ML32 LL32	RW	Limit 1	-500.000..+500.000 [mm]
061 062 063 064	3d 3e 3f 40	HH32 MH32 ML32 LL32	RW	Limit 0	-500.000..+500.000 [mm]
065 066 067 068	41 42 43 44	HH32 MH32 ML32 LL32	RW	Limit A	-500.000..+500.000 [mm]

GAUGE					
Table No. 100 - Section A: Part Program 1 parameters					
Address		Portion	Rights	Description	Notes
Dec	Hex				
069	45	BIT	RW	Deviation center Synchronism	CxSx xxxx bit 7: 0 = theoretical, 1 = real bit 5: 0 = Sync 1, 1 = Sync2
070	46	BYTE	RW	Transducer	0 = G2 1 = G3 2 = G4 3 = G5
071 072	47 48	HIGH LOW	RW	Transducer coefficient	-10.000 .. +10.000
073	49	BYTE	RW	Component to calculate residual	0 .. 63
074	4a	BYTE	RW	Roundness analysis	0 = OFF 1 = ON
075	4b	BIT	RW	Formula: Limit 1 – 1 st term : Entity Operator	Bit 3..0 : 0 = none 1 = Internal deviation 2 = External deviation 3 = Excentricity 4 = Ovality 5 = 3-lobe 6 = 4-lobe 7 = 5-lobe 8 = Residual Bit 4: 0 = '.' (end) 1 = '+'
076	4c	BIT	RW	Formula: Limit 1 – 2 nd term : Entity	Bit 3..0 : 0 = none 1 = Internal deviation 2 = External deviation 3 = Excentricity 4 = Ovality 5 = 3-lobe 6 = 4-lobe 7 = 5-lobe 8 = Residual
077	4d	BIT	RW	formula: Limit 2 : Entity	Bit 3..0 : 0 = none 1 = Internal deviation 2 = External deviation 3 = Excentricity 4 = Ovality 5 = 3-lobe 6 = 4-lobe 7 = 5-lobe 8 = Residual
078	4e	BIT	RW	Formula: Limit 3 : Entity	Bit 3..0 : 0 = none 1 = Internal deviation 2 = External deviation 3 = Excentricity 4 = Ovality 5 = 3-lobe 6 = 4-lobe 7 = 5-lobe 8 = Residual

GAUGE					
Table No. 100 - Section A: Part Program 1 parameters					
Address		Portion	Rights	Description	Notes
079	4f	HH32	RW	Formula: Limit 1 - 1 st term: Limit value	-3.2000..+ 3.2000
080	50	MH32			
081	51	ML32			
082	52	LL32			
083	53	HH32	RW	Formula: Limit 1 – 2 nd term: Limit value	-3.2000..+ 3.2000
084	54	MH32			
085	55	ML32			
086	56	LL32			
087	57	HH32	RW	Formula: Limit 2: Limit value	-3.2000..+ 3.2000
088	58	MH32			
089	59	ML32			
090	5a	LL32			
091	5b	HH32	RW	Formula: Limit 3: Limit value	-3.2000..+ 3.2000
092	5c	MH32			
093	5d	ML32			
094	5e	LL32			

GAUGE					
Table No. 100 - Section A: Part Program 1 parameters – additional synchronism parameters					
Address		Portion	Rights	Description	Notes
095	5f	BYTE	RW	Workpiece profile	0 = Plain (continuous) 1 = Even 2 = Odd
096	60	BYTE	RW	Damping	0...5
097 098	61 62	HIGH LOW	RW	Workhead RPM	1...30000
099	63	BYTE	RW	Operating mode	0 = start 1 = start + stop
100	64	BYTE	RW	Activation Edge	0 = Positive 1 = Negative
101 102	65 66	HIGH LOW	RW	Start threshold	-32.000 .. 32.000
103 104	67 68	HIGH LOW	RW	Stop threshold	-32.000 .. 32.000
105	69	BYTE	RW	Time base	0 = Time 1 = Sync software 2 = Sync 1 3 = Sync 2
106 107	6a 6b	HIGH LOW	RW	Mechanical delay	0 .. 65535 [ms]
108 109	6c 6d	HIGH LOW	RW	Sampling sector	0 .. 65535 [ms]
110 111	6e 6f	HIGH LOW	RW	Electrical delay	0 .. 65535 [ms]
112 113	70 71	HIGH LOW	RW	Blanking time	0.0 .. 360.0 [deg]
114 115	72 73	HIGH LOW	RW	Blanking time	0 .. 65535 [ms]

6. GAUGE [NG type] communication tables

Device address		
Device	Device address	
	Dec	Hex
NG Gauge	68	44

Table No.		
Table	Table (16bit)	
	Dec	Hex
General parameters	0	00
Section A Programming	1	01
Setup	4	04
Roundness and shape data	7	07
Section A – Part program 1	100	64

6.1. Gauge – General parameters table

GAUGE General parameters					
Address		Portion	Rights	Description	Notes
Dec	Hex				
021 022	15 16	HIGH LOW	R	Software version	
023 024	17 18	HIGH LOW	R	Software Revision	
200 201 202 203	c8 c9 ca cb	HH32 MH32 ML32 LL32	R	Master diameter	0.0000 ... 500.0000 [mm]

GAUGE General parameters: Internal commands					
Address		Portion	Rights	Description	Notes
Dec	Hex				
090	5a	BYTE	W	Internal commands	0 = no command 1 = force parameters update

NOTE

Send the internal command to the system “FORCE PARAMETERS UPDATE” after a write operation of new parameter values, in order to ensure a correct updating of the setup of the device involved.

6.2. Gauge – Section A Programming table

GAUGE Section A – Section Parameters					
Address		Portion	Rights	Description	Notes
Dec	Hex				
200	c8	BYTE	RW	Freeze last dimension	0 = OFF 1 = ON
203 204	cb cc	HIGH LOW	R/W	Offset increment step	0.0001 ... 3.2000 [mm]

GAUGE Section A: Part-Program selection					
Address		Portion	Rights	Description	Notes
Dec	Hex				
247	f7	BYTE	W	Part Program selection	0 = Part-Program 1 1 = Part-Program 2 ... 7 = Part-Program 8
248	f8	BYTE	W	Section command	Command: 240 = Part-Program selection request
249	f9	BYTE	R	Part-Program selected for programming	
250	fa	BYTE	R	Commands state	

NOTE Program the parameters of a part program:

- Read and verify that "Commands state" == 0
250 (FAh), status
- Write selected part program (0 to 7) in 247 (f7h) Part program selection
- Write value 240 in 248 (f8h) Section command
- Verify the correct part program selection checking the selected part program has been write in 249 (f9h)
- Access to the tables of the parameters of selected part program (see below)

GAUGE					
Section A: Part Program - gauging parameters					
Address		Portion	Rights	Description	Notes
Dec	Hex				
000 001	00 01	HIGH LOW	RW	Gauging cycle start delay	0.0 .. 100.0 [s]
002 003	02 03	HIGH LOW	RW	Remaining traverse time	0.0 .. 100.0 [s]
004 005	04 05	HIGH LOW	RW	Master deviation from zero	-1.0000 .. +1.0000 [mm]
006 007	06 07	HIGH LOW	RW	Formula: Transducer G2 coeff.	-10.000 .. +10.000
008 009	08 09	HIGH LOW	RW	Formula: Transducer G3 coeff.	-10.000 .. +10.000
010 011	0a 0b	HIGH LOW	RW	Formula: Transducer G4 coeff.	-10.000 .. +10.000
012 013	0c 0d	HIGH LOW	RW	Formula: Transducer G5 coeff.	-10.000 .. +10.000
014 015	0e 0f	HIGH LOW	RW	Formula: Finger ratio	-10.000 .. +10.000

GAUGE					
Section A: Part Program - gauging parameters					
Address		Portion	Rights	Description	Notes
Dec	Hex				
016 017	10 11	HIGH LOW	RW	Offset	-3.2000 ... +3.2000 [mm]
018 019 020 021	12 13 14 15	HH32 MH32 ML32 LL32	RW	Nominal dimension	0.0000 ... 500.0000 [mm]
022 023 024 025	16 17 18 19	HH32 MH32 ML32 LL32	RW	Rest dimension	0.0000 ... 500.0000 [mm]
026	1a	BYTE	RW	Gauge mode	0 = In-process 1 = Post-process
027	1b	BYTE	RW	Synchronism	0 = OFF 1 = Synchronism 1 2 = Synchronism 2 3 = Software 4 = G2 5 = G3 6 = G4 7 = G5 8 = Dimension
028	1c	BYTE	RW	Gauge mode (if synchro)	0 = continue 1 = max 2 = min 3 = average
029 030	1d 1e	HIGH LOW	RW	Mechanical delay	0.0 .. 360.0 [deg]
031 032	1f 20	HIGH LOW	RW	Sampling sector	0.0 .. 360.0 [deg]
033 034	21 22	HIGH LOW	RW	Electrical delay	0.0 .. 360.0 [deg]
038	26	BYTE	RW	Dimension stability timer	0.0 .. 25.0 [s]
039 040	27 28	HIGH LOW	RW	Dimension stability tolerance	0 .. 1.000 [mm]
070 071	46 47	HIGH LOW	RW	Dimension stability timeout	0.0 .. 25.0 [s]
045	2d	BYTE	RW	Synchronized Zeroing	0=OFF 1=ON
046	2e	BYTE	RW	Measure Type	0 = Normal 1 = Absolute
047	2f	BYTE	RW	Workpiece profile	0 = Plain (continuous) 1 = Even 2 = Odd
048	30	BYTE	RW	Damping	0 .. 5
049 050	31 32	HIGH LOW	RW	Workhead rpm	1 .. 30000
051	33	BYTE	RW	Operating mode	0 = start 1 = start + stop
052	34	BYTE	RW	Activation edge	0 = positive 1 = negative

GAUGE					
Section A: Part Program - gauging parameters					
Address		Portion	Rights	Description	Notes
Dec	Hex				
053 054	35 36	HIGH LOW	RW	Start threshold	-32.000 .. 32.000
055 056	37 38	HIGH LOW	RW	Stop threshold	-32.000 .. 32.000
057	39	BYTE	RW	Time base	0 = Time 1 = Sync software 2 = Sync 1 3 = Sync 2
058 059	3a 3b	HIGH LOW	RW	Mechanical delay	0 .. 65535 [ms]
060 061	3c 3d	HIGH LOW	RW	Electrical delay	0 .. 65535 [ms]
062 063	3e 3f	HIGH LOW	RW	Sampling sector	0 .. 65535 [ms]
064 065	40 41	HIGH LOW	RW	Blanking time	0.0 .. 360.0 [deg]
066 067	42 43	HIGH LOW	RW	Blanking time	0 .. 65535 [ms]
068 069	44 45	HIGH LOW	R/W	Dwell timeout (sparkout)	-0.1 ... 1000.0 [s] (-0.1 = disable)
100	64	BYTE	RW	Limit Type	0 = Relative 1 = Absolute
101 102 103 104	65 66 67 68	HH32 MH32 ML32 LL32	RW	Limit 4	-500.000..+500.000 [mm]
105 106 107 108	69 6a 6b 6c	HH32 MH32 ML32 LL32	RW	Limit 3	-500.000..+500.000 [mm]
109 110 111 112	6d 6e 6f 70	HH32 MH32 ML32 LL32	RW	Limit 2	-500.000..+500.000 [mm]
113 114 115 116	71 72 73 74	HH32 MH32 ML32 LL32	RW	Limit 1	-500.000..+500.000 [mm]
117 118 119 120	75 76 77 78	HH32 MH32 ML32 LL32	RW	Limit 0	-500.000..+500.000 [mm]
121 122 123 124	79 7a 7b 7c	HH32 MH32 ML32 LL32	RW	Limit A	-500.000..+500.000 [mm]

GAUGE					
Section A: Part Program - Roundness parameters					
Address		Portion	Rights	Description	Notes
Dec	Hex				
150	96	BYTE	RW	Roundness analysis	0 = OFF 1 = ON
151	97	BIT	RW	Deviation center Synchronism	CxSx xxxx bit 7: 0 = theoretical, 1 = real bit 5: 0 = Sync 1, 1 = Sync2
152	98	BYTE	RW	Transducer	0 = G2 1 = G3 2 = G4 3 = G5
153 154	99 9a	HIGH LOW	RW	Transducer coefficient	-10.000 .. +10.000
155	9b	BYTE	RW	Component to calculate residual	0 .. 63
156	9c	BIT	RW	Formula: Limit 1 - 1 st term : Entity Operator	Bit 3..0 : 0 = none 1 = Internal deviation 2 = External deviation 3 = Excentricity 4 = Ovality 5 = 3-lobe 6 = 4-lobe 7 = 5-lobe 8 = Residual Bit 4: 0 = ':' (end) 1 = '+'
157	9d	BIT	RW	Formula: Limit 1 - 2 nd term : Entity	Bit 3..0 : 0 = none 1 = Internal deviation 2 = External deviation 3 = Excentricity 4 = Ovality 5 = 3-lobe 6 = 4-lobe 7 = 5-lobe 8 = Residual
158	9e	BIT	RW	formula: Limit 2 : Entity	Bit 3..0 : 0 = none 1 = Internal deviation 2 = External deviation 3 = Excentricity 4 = Ovality 5 = 3-lobe 6 = 4-lobe 7 = 5-lobe 8 = Residual
159	9f	BIT	RW	Formula: Limit 3 : Entity	Bit 3..0 : 0 = none 1 = Internal deviation 2 = External deviation 3 = Excentricity 4 = Ovality 5 = 3-lobe 6 = 4-lobe 7 = 5-lobe 8 = Residual

GAUGE					
(... continue) Section A: Part Program - Roundness parameters					
Address		Portion	Rights	Description	Notes
160	a0	HH32	RW	Formula: Limit 1 - 1 st term Limit value	-3.2000..+ 3.2000
161	a1	MH32			
162	a2	ML32			
163	a3	LL32			
164	a4	HH32	RW	Formula: Limit 1 – 2 nd term Limit value	-3.2000..+ 3.2000
165	a5	MH32			
166	a6	ML32			
167	a7	LL32			
168	a8	HH32	RW	Formula: Limit 2 Limit value	-3.2000..+ 3.2000
169	a9	MH32			
170	aa	ML32			
171	ab	LL32			
172	ac	HH32	RW	Formula: Limit 3 Limit value	-3.2000..+ 3.2000
173	ad	MH32			
174	ae	ML32			
175	af	LL32			

6.3. Gauge – Setup parameters table

GAUGE Setup: General setup					
Address		Portion	Rights	Description	Notes
Dec	Hex				
003	03	BYTE	RW	Reset mode	0 = START 1 = ENABLE
008	08	BYTE	RW	Sync 1: No. of references per revolution	1..24
009 010	09 0a	HIGH LOW	RW	Sync 1: Minimum part rpm	0..1200
011	0b	BYTE	RW	Sync 2: No. of references per revolution	1..24
012 013	0c 0d	HIGH LOW	RW	Sync 2: Minimum part rpm	0..1200
Offset to access the device parameters (value to be added to parameter "Address")					
Transducer n.				Dec	Hex
Transducer G2				0	0
Transducer G3				40	28
Transducer G4				80	50
Transducer G5				120	78
GAUGE Setup: Transducer G2 parameters					
Address		Portion	Rights	Description	Notes
Dec	Hex				
030 031	1E 1F	HIGH LOW	RW	Gauging RMS filter	0..400
033	21	BYTE	RW	Transducer type	0 = Custom 1 = TG 2 = TG200-LG
034 035	22 23	HIGH LOW	RW	Transducer sensitivity [mV/mm/V]	-300.0..300.0 (Custom and TG Type)
036 037	24 25	HIGH LOW	RW	Minimum dimension	-32.000 .. 32.000
038 039	26 27	HIGH LOW	RW	Maximum dimension	-32.000 .. 32.000
040	28	BYTE	RW	Retraction control	0 = OFF 1 = ON
041 042	29 2A	HIGH LOW	RW	Roundness RMS filter	0..400
043 044	2B 2C	HIGH LOW	RW	Upper overrange	-32.000 .. 32.000
047 048	2F 30	HIGH LOW	RW	Energizing voltage [V]	0.0..10.5 (Custom and TG Type)
049 050	31 32	HIGH LOW	RW	TG200-LG: Energizing voltage [V]	0.0..10.5
051 052	33 34	HIGH LOW	RW	TG200-LG: Transducer sensitivity [mV/mm/V]	-300.0..300.0
055 056	37 38	HIGH LOW	RW	Lower overrange	-32.000 .. 32.000
057 058	39 3A	HIGH LOW	RW	Retraction dimension	-32.000 .. 32.000

6.4. Gauge – Roundness and shape data

GAUGE Roundness and shape data – Section A					
Address		Portion	Rights	Description	Notes
Dec	Hex				
000 001	00 01	HIGH LOW	R	Internal deviation	Resolution 0.1 µm
002 003	02 03	HIGH LOW	R	External deviation	Resolution 0.1 µm
004 005	04 05	HIGH LOW	R	Runout	Resolution 0.1 µm
006 007	06 07	HIGH LOW	R	Excentricity	Resolution 0.1 µm
008 009	08 09	HIGH LOW	R	Ovality	Resolution 0.1 µm
010 011	0a 0b	HIGH LOW	R	3 – lobe	Resolution 0.1 µm
012 013	0c 0d	HIGH LOW	R	4 – lobe	Resolution 0.1 µm
014 015	0e 0f	HIGH LOW	R	5 – lobe	Resolution 0.1 µm
016 017	10 11	HIGH LOW	R	Residual	Resolution 0.1 µm

6.5. Gauge – Section A: Part Program 1 parameters

GAUGE					
Table No. 100 - Section A: Part Program 1 parameters					
Address		Portion	Rights	Description	Notes
Dec	Hex				
000 001	00 01	HIGH LOW	RW	Formula: Transducer G2 coeff.	-10.000 .. +10.000
002 003	02 03	HIGH LOW	RW	Formula: Transducer G3 coeff.	-10.000 .. +10.000
004 005	04 05	HIGH LOW	RW	Formula: Transducer G4 coeff.	-10.000 .. +10.000
006 007	06 07	HIGH LOW	RW	Formula: Transducer G5 coeff.	-10.000 .. +10.000
008 009	08 09	HIGH LOW	RW	Formula: Gain coeff	-10.000 .. +10.000
010	0a	BYTE	RW	Gauge mode (if synchro)	0 = continue 1 = max 2 = min 3 = average
011	0b	BYTE	RW	Synchronism	0 = OFF 1 = Synchronism 1 2 = Synchronism 2
012 013	0c 0d	HIGH LOW	RW	Mechanical delay	0 .. 360.0 [deg]
014 015	0e 0f	HIGH LOW	RW	Sampling sector	0 .. 360.0 [deg]
016 017	10 11	HIGH LOW	RW	Electrical delay	0 .. 360.0 [deg]
018	12	BYTE	RW	Synchronized Zeroing	0=OFF 1=ON
019 020 021 022	13 14 15 16	HH32 MH32 ML32 LL32	RW	Nominal dimension	0.0000 ... 500.0000 [mm]
023 024 025 026	17 18 19 1a	HH32 MH32 ML32 LL32	RW	Rest dimension	0.0000 ... 500.0000 [mm]
027	1b	BYTE	RW	Measure Type	0 = Normal 1 = Absolute
028	1c	BYTE	RW	Gauge mode	0 = In-process 1 = Post-process
029 030	1d 1e	HIGH LOW	RW	Gauging cycle start delay	0.0 .. 100.0 [s]
031 032	1f 20	HIGH LOW	RW	Remaining traverse time	0.0 .. 100.0 [s]
033 034	21 22	HIGH LOW	RW	Master deviation from zero	-1.0000 .. +1.0000 [mm]
035 036	23 24	HIGH LOW	RW	Offset	-3.2000 .. +3.2000 [mm]
037	25	BYTE	RW	Timer for dimension stability	0 .. 25.0 [s]
038 039	26 27	HIGH LOW	RW	Tolerance valid dimension	0 .. 1.000 [mm]
070 071	46 47	HIGH LOW	RW	Dimension stability timeout	0.0 .. 25.0 [s]

GAUGE					
Table No. 100 - Section A: Part Program 1 parameters					
Address		Portion	Rights	Description	Notes
Dec	Hex				
040 041 042 043	28 29 2a 2b	HH32 MH32 ML32 LL32	RW	Electrical zero	[nm]
044	2c	BYTE	RW	Limit Type	0 = Relative 1 = Absolute
045 046 047 048	2d 2e 2f 30	HH32 MH32 ML32 LL32	RW	Limit 4	-500.000..+500.000 [mm]
049 050 051 052	31 32 33 34	HH32 MH32 ML32 LL32	RW	Limit 3	-500.000..+500.000 [mm]
053 054 055 056	35 36 37 38	HH32 MH32 ML32 LL32	RW	Limit 2	-500.000..+500.000 [mm]
057 058 059 060	39 3a 3b 3c	HH32 MH32 ML32 LL32	RW	Limit 1	-500.000..+500.000 [mm]
061 062 063 064	3d 3e 3f 40	HH32 MH32 ML32 LL32	RW	Limit 0	-500.000..+500.000 [mm]
065 066 067 068	41 42 43 44	HH32 MH32 ML32 LL32	RW	Limit A	-500.000..+500.000 [mm]

GAUGE					
Table No. 100 - Section A: Part Program 1 parameters					
Address		Portion	Rights	Description	Notes
Dec	Hex				
069	45	BIT	RW	Deviation center Synchronism	CxSx xxxx bit 7: 0 = theoretical, 1 = real bit 5: 0 = Sync 1, 1 = Sync2
070	46	BYTE	RW	Transducer	0 = G2 1 = G3 2 = G4 3 = G5
071 072	47 48	HIGH LOW	RW	Transducer coefficient	-10.000 .. +10.000
073	49	BYTE	RW	Component to calculate residual	0 .. 63
074	4a	BYTE	RW	Roundness analysis	0 = OFF 1 = ON
075	4b	BIT	RW	Formula: Limit 1 – 1 st term : Entity Operator	Bit 3..0 : 0 = none 1 = Internal deviation 2 = External deviation 3 = Excentricity 4 = Ovality 5 = 3-lobe 6 = 4-lobe 7 = 5-lobe 8 = Residual Bit 4: 0 = '.' (end) 1 = '+'
076	4c	BIT	RW	Formula: Limit 1 – 2 nd term : Entity	Bit 3..0 : 0 = none 1 = Internal deviation 2 = External deviation 3 = Excentricity 4 = Ovality 5 = 3-lobe 6 = 4-lobe 7 = 5-lobe 8 = Residual
077	4d	BIT	RW	formula: Limit 2 : Entity	Bit 3..0 : 0 = none 1 = Internal deviation 2 = External deviation 3 = Excentricity 4 = Ovality 5 = 3-lobe 6 = 4-lobe 7 = 5-lobe 8 = Residual
078	4e	BIT	RW	Formula: Limit 3 : Entity	Bit 3..0 : 0 = none 1 = Internal deviation 2 = External deviation 3 = Excentricity 4 = Ovality 5 = 3-lobe 6 = 4-lobe 7 = 5-lobe 8 = Residual

GAUGE					
Table No. 100 - Section A: Part Program 1 parameters					
Address		Portion	Rights	Description	Notes
079	4f	HH32	RW	Formula: Limit 1 - 1 st term: Limit value	-3.2000..+ 3.2000
080	50	MH32			
081	51	ML32			
082	52	LL32			
083	53	HH32	RW	Formula: Limit 1 – 2 nd term: Limit value	-3.2000..+ 3.2000
084	54	MH32			
085	55	ML32			
086	56	LL32			
087	57	HH32	RW	Formula: Limit 2: Limit value	-3.2000..+ 3.2000
088	58	MH32			
089	59	ML32			
090	5a	LL32			
091	5b	HH32	RW	Formula: Limit 3: Limit value	-3.2000..+ 3.2000
092	5c	MH32			
093	5d	ML32			
094	5e	LL32			

GAUGE					
Table No. 100 - Section A: Part Program 1 parameters – additional synchronism parameters					
Address		Portion	Rights	Description	Notes
095	5f	BYTE	RW	Workpiece profile	0 = Plain (continuous) 1 = Even 2 = Odd
096	60	BYTE	RW	Damping	0...5
097 098	61 62	HIGH LOW	RW	Workhead RPM	1...30000
099	63	BYTE	RW	Operating mode	0 = start 1 = start + stop
100	64	BYTE	RW	Activation Edge	0 = Positive 1 = Negative
101 102	65 66	HIGH LOW	RW	Start threshold	-32.000 .. 32.000
103 104	67 68	HIGH LOW	RW	Stop threshold	-32.000 .. 32.000
105	69	BYTE	RW	Time base	0 = Time 1 = Sync software 2 = Sync 1 3 = Sync 2
106 107	6a 6b	HIGH LOW	RW	Mechanical delay	0 .. 65535 [ms]
108 109	6c 6d	HIGH LOW	RW	Sampling sector	0 .. 65535 [ms]
110 111	6e 6f	HIGH LOW	RW	Electrical delay	0 .. 65535 [ms]
112 113	70 71	HIGH LOW	RW	Blanking time	0.0 .. 360.0 [deg]
114 115	72 73	HIGH LOW	RW	Blanking time	0 .. 65535 [ms]

7. Appendix

Documenti richiamati nel testo		
Nome documento	Capitoli	Collegamento
Multinet	1.2	9UMEN2503-1200 Multinet