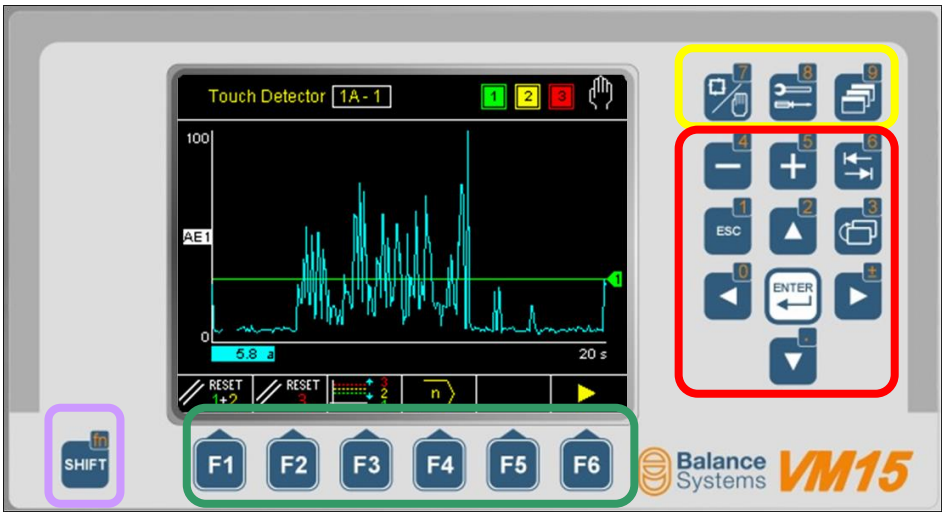
VM15

Panel quick guide

User manual
VM15 – Panel quick guide

9UMEN1513-1200
Release: 220128

VM15 Panel & Keyboard



System commands

SETUP & PROGRAMMING
Button num: 8

AUTOMATIC / MANUAL MODE
Button num: 7

CHANGE PAGES
Button num: 9

DECREMENT VALUE
Button num: 4

SET DEFAULT / TAB
Button num: 6

INCREMENT VALUE
Button num: 5

PREVIOUS MENU
Button num: 3

ESCAPE / EXIT
Button num: 1

MOVE UP
Button num: 2

MOVE LEFT
Button num: 0

MOVE RIGHT
Button num: ±

CONFIRM

MOVE DOWN
Button num: . (decimal point)

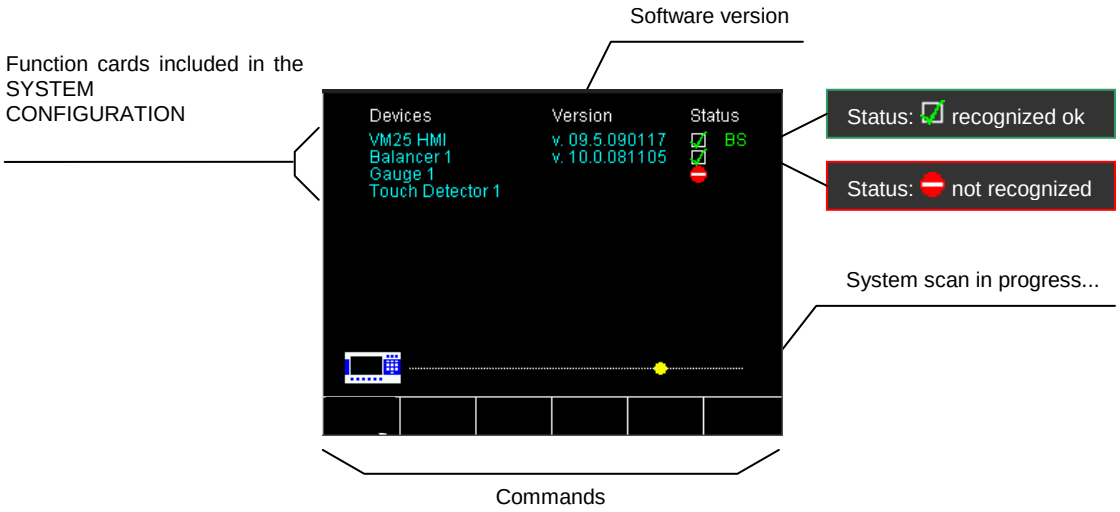
Main keyboard

SHIFT
2nd FUNCTION for F1..F6 Softkey
Button Num Enable

Fx
FUNCTION SOFTKEY F1..F6
Commands

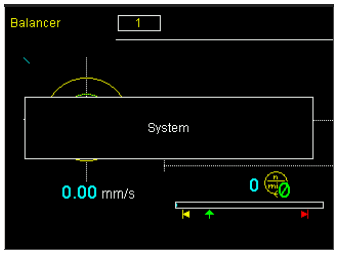
VM15 HMI Panel Functions

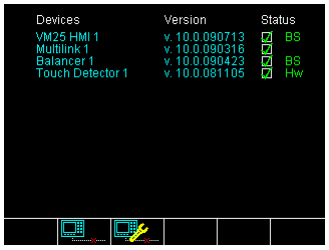
While the system starts up…



Access the System page

Press  until the dialog box displays “SYSTEM” then release to access the System page

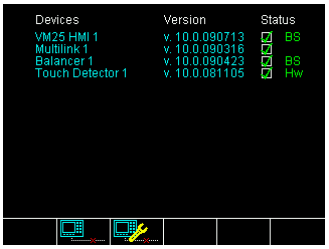




	F1	Connect to the system (scan)
	F2	Disconnect communication with the system
	F3	Go to SERVICE mode

VM15 HMI Setup access

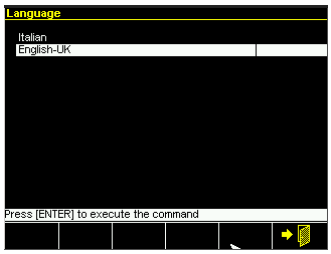
Starting from System page, press  then:  to access the HMI parameter setup or  for direct commands



	F1	Language setup
	F2	Login access
	F3	Backup / Restore / Upgrade
	F4	Contrast / Brightness regulation (for monochrome display only)
	F2	Reboot VM15 HMI

Language setup

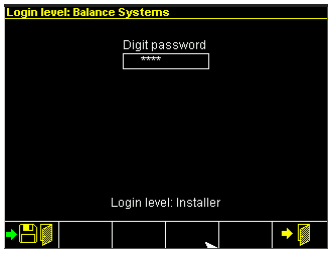
Using  or  select the language and press  . The activation of the new language takes a few seconds…



	F6	Exit

Login access

Using  +  key in the PASSWORD to login and press  . For a complete list of the passwords see table below.



	F1	Save login & Exit
	F6	Apply & Exit without saving

Password	Name	Description
Login		
1	Observer	The system works in automatic mode only with no commands available for the user
1 2 9 4	Operator	The system works in automatic mode only. The user can access the commands available in automatic mode (i.e. LIMITS CORRECTION, GAUGE OFFSET, etc.). Depending upon the choices of the system installer, the manual mode for the balancer functions can be available for the user
1 4 3 2	Programmer	The system works both in automatic and in manual mode. The user has access the working parameters and some setup parameters
1 2 2 1	Installer	Full system control and access to all parameters
Config		
1 3 4 8 9	Output Logic	Enables changing of the digital output logic of the function cards

Backup / Restore system parameters and configuration – Software Upgrade

	F2	System backup
	F3	Master backup (portable file)
	F4	Restore
	F5	Software Up-grade
	F6	Log file viewer

Parameter modification

Parameters	Procedure to access
HMI PARAMETERS (System parameters)	press  until the dialog box displays “SYSTEM” then release to access the System page press  then  or  to select “HMI” and  to access the HMI parameters
FUNCTION CARD PARAMETERS - **Balancer** - **Touch Detector** - **Gauge** - **Multilink**	**NOTE**: the access to function card parameter is allowed in MANUAL MODE only press  from the status page of the function card An alternative: press  until “SYSTEM” is displayed then release to access the System page press  then  or  to select the function card (i.e. BALANCER 1) and 

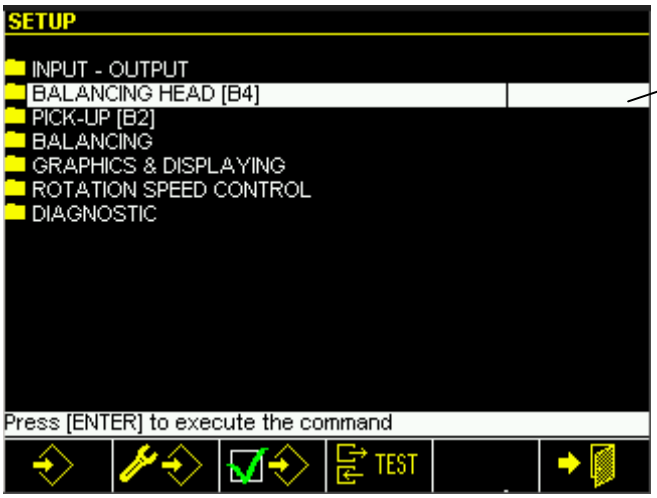
Parameter category	Command to access		Description
WORK		F1	Working parameters to perform the process under control. They are usually identified as PART-PROGRAM
SETUP		F2	Full set of parameters to setup the input/output, to configure the sensors and actuators and to optimize the filters and algorithms
OPTION		F3	List of options which can be installed for each function

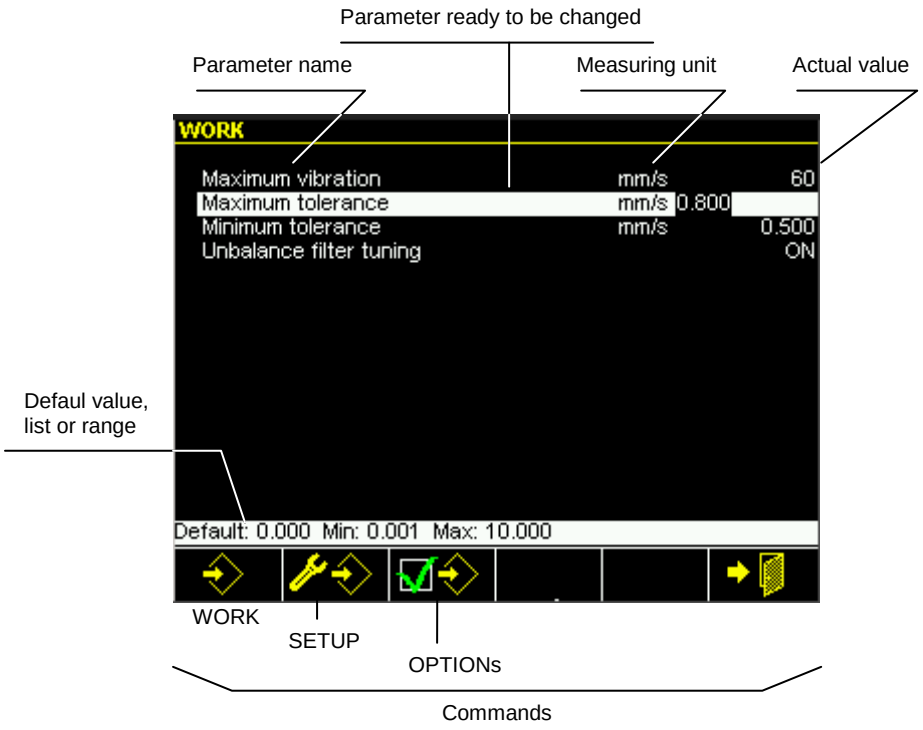
Parameter type	Property	Procedure to modify the value
Numerical	DEFAULT VALUE: factory presets RANGE: Min..Max MEASURING UNIT (if applicable)	▪  +  to key in the numerical value ▪  ,  to decrement or increment the value ▪  to apply the DEFAULT (factory set) value  to save the new value ***NOTE**: A value out of RANGE is rejected*
List of values	DEFAULT VALUE: factory presets LIST OF VALUES	▪  ,  to change the value in the list ▪  to apply the DEFAULT (factory set) value  to save the new value

Parameter page description

All the parameters are organized as a tree where the parameters are grouped into folders

Press  or  to select the folder and  to access the parameters page

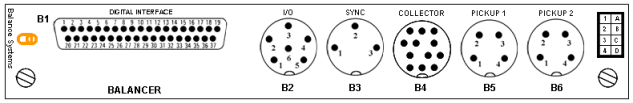
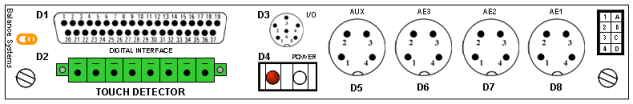
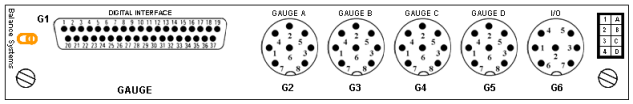
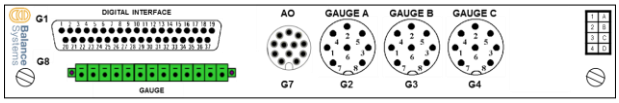
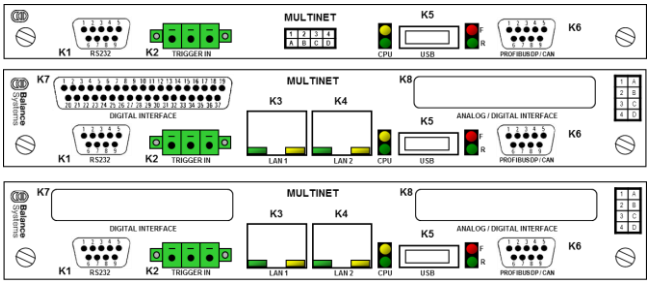




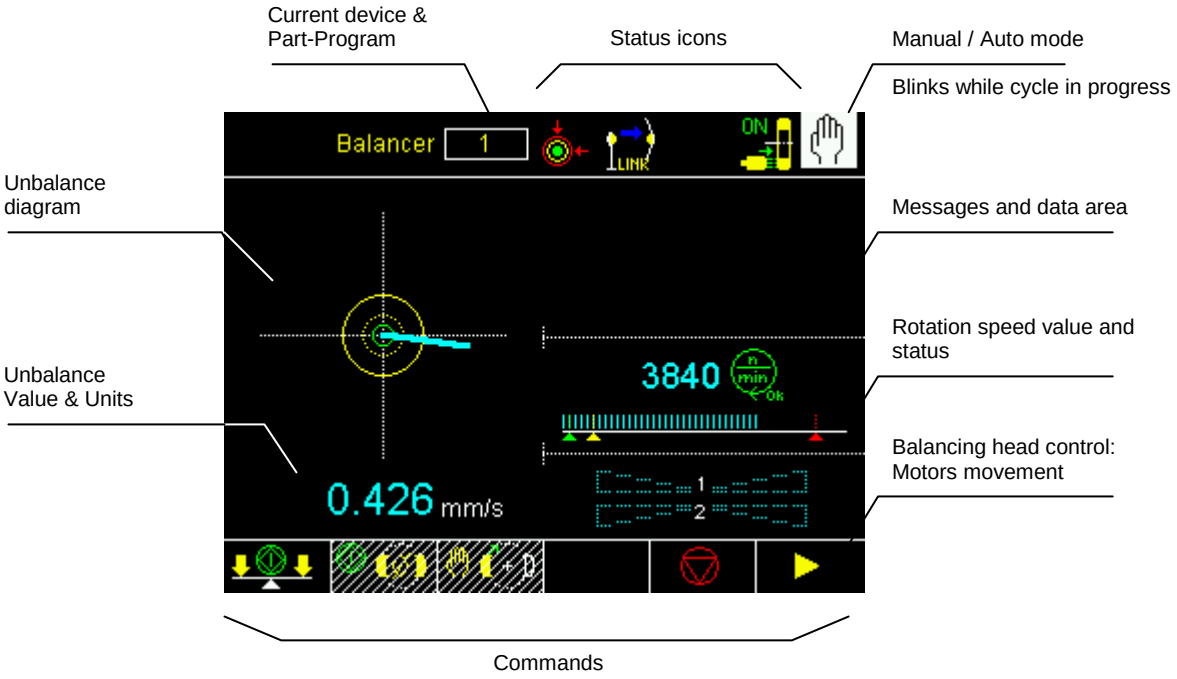
List of System commands

Main commands					
	F1	Connect to the system			
	F2	Disconnect communication with the system			
	F3	Go to SERVICE mode			
	F1	Language setup			
	F2	Login access			
	F3	Backup / Restore / Software Up-grade			
	F2	System Parameters Backup			
	F3	Master Parameters Backup (portable file)			
	F4	Parameters Restore			
	F5	Software Up-grade			
	F6	Log file viewer			
	F4	Contrast / Brightness regulation *(for monochrome display only)*			
	F2	Reboot VM15 HMI			
General commands available in the procedures					
	-	Confirm / Apply		-	Cancel
	-	Start		-	Stop
	F6	Next menu or step		F1	Previous menu or step
	-	Delete file			
	F1	Save & Exit		F6	Exit

Device recognizing

Device card layout	
	Balancer [type BN]
	Touch detector [type TD]
	Gauge [type GA]
	Gauge [type NG]
	Multinet [MN]

1 PLANE BALANCER [type BN]



Status icons

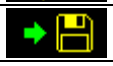
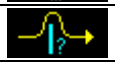
Unbalance	
	Unbalance inside min tolerance
	Unbalance inside max tolerance
	Unbalance out of tolerance
	ALARM: Max vibration
Spindle rotation speed	
	Spindle steady
	Spindle at nominal speed
	Spindle not at nominal speed
	ALARM: Spindle speed over max limit
	ALARM: Rotation speed fault

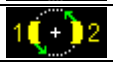
Balancing head	
	Neutral position reached
	WARNING: Neutral cycle impossible
	ALARM: Neutral cycle fault
	ALARM: Max compensation reached
	ALARM: Balancing head motors fault > Execute Neutral cycle
Accelerometer (pick-up)	
	ALARM: Pickup fault
Balancing cycle	
	WARNING: Automatic balancing impossible
	WARNING: Balancing timeout
General	
	ALARM (generic)

NoLink collector	
	WARNING: Collector not ready
	Hardware link in progress... (animated)
	Communication link in progress… (animated)
	Collector connected
	WARNING: Collector misaligned
	WARNING: Static part protection
	WARNING: Rotating part protection
	ALARM: Temperature on static part
	ALARM: Temperature on rotating part
	ALARM: Static part
	ALARM: Rotating part
Brushes collector	
	Brushes collector: Power ON
	Ring collector: Electrovalve ON

Commands

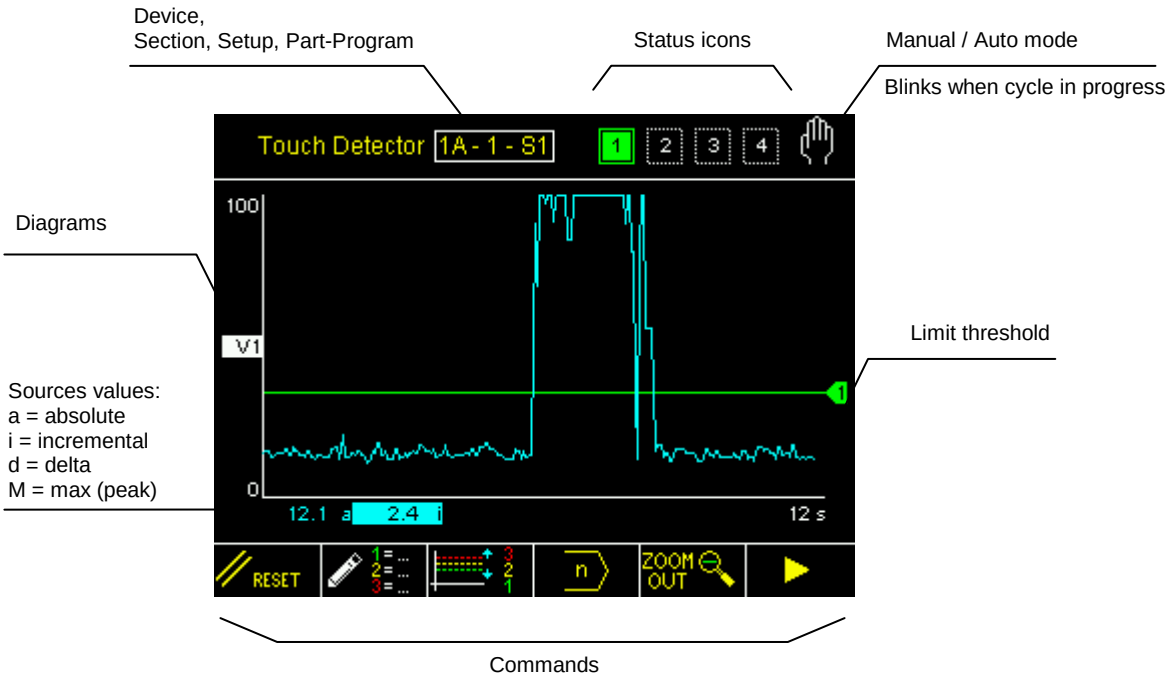
Main commands		
	F1	Start automatic balancing cycle [1 plane]
	F2	Start automatic neutral positioning cycle [weights @ 180°]
	F3	Start manual driving of balancing head motors
	F4	IF ENABLED - Start guided manual balancing procedure [1 plane] (PRE-BALANCING)

Manual balancing procedure [1 plane]					
				F2	Calibration
	F2	Weights acquisition		-	End weights acquisition
	-	Change		F3	Corrections
	-	Save calibration		-	Ignore / Skip

Manual driving of balancing head motors					
COMBINED mode			INDEPENDENT mode		
	F1	Cross forward		F1	Motor 1 forward
	F2	Cross backward		F2	Motor 1 backward
	F3	Both forward		F3	Motor 2 forward
	F4	Both backward		F4	Motor 2 backward
	F6	Switch to “Single mode”		F6	Switch to “Combined mode”

Commands in Parameter Setup		
	F4	To check the wiring of the DIGITAL INTERFACE [Connector B1]

TOUCH DETECTOR [TD]



Status icons

Outputs	
1 2 3 4	Output limits activated
1 2 3 4	Output limits ready

Sensors	
AE1	WARNING: Acoustic Emission sensor No.1 not ready
AE2	WARNING: Acoustic Emission sensor No.2 not ready
AE3	WARNING: Acoustic Emission sensor No.3 not ready
AUX	WARNING: Auxiliary sensor not ready
P	WARNING: Power sensor not ready

FFT Analysis	
FFT	FFT in run mode
FFT MAX	FFT in peak detection mode
FFT Ø	FFT ZERO active

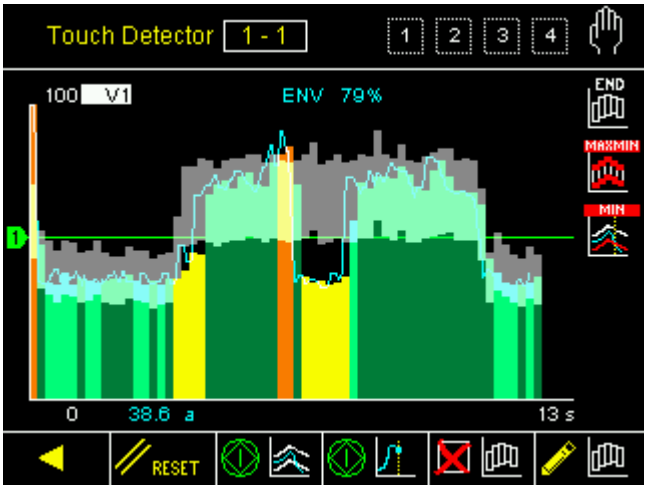
Glossary

AE = Acoustic Emission
Aux = Auxiliary source
P = Power
V = Variable

Envelope - Status signalling

MASTER	No stored time duration
MASTER	Time duration learning in process
MASTER	Time duration learning error
MASTER	Time duration learning correct executed
MASTER	No stored master
MASTER	Master learning in process
MASTER	Master learning error
MASTER	Master learning good
	Process timeout
	Autostart timeout
GO	Envelope in progress
STOP	Process stopped

MAX	Zone over tolerance
MIN	Zone below tolerance
MAXMIN	Zones out of tollerance
MAX	Ip max
MIN	Ip min
CRASH	Ip crash
MAXMIN	Ip max – min
END	Envelope End
GOOD	Envelope good
MAX	Process over tolerance
MIN	Process below tolerance
MAXMIN	Process out of tolerance



Commands

Commands in Automatic Mode		
1	F1	Quick Limit 1 correction
2	F2	Quick Limit 2 correction
3	F3	Quick Limit 3 correction
4	F4	Quick Limit 4 correction

Commands in Manual Mode		
RESET	F1	Reset
1= ... 2= ... 3= ...	F2	Edit Part Program FORMULA for output limits definition
3 2 1	F3	Access to Quick Limits correction
n	F4	IF ENABLED - Part-Program selection
ZOOM IN	F5	Zoom in on diagrams
ZOOM OUT	F5	Zoom out on diagrams
V1	F2	Setup of Variable V1
V2	F3	Setup of Variable V2
V3	F4	Setup of Variable V3
V4	F5	Setup of Variable V4
P	F2	Setup of Power transducer [Connector D4]

Zoom				
V1 OFF		V1 ON		Toggle ON/OFF V1 diagram
V2 OFF		V2 ON		Toggle ON/OFF V2 diagram
V3 OFF		V3 ON		Toggle ON/OFF V3 diagram
V4 OFF		V4 ON		Toggle ON/OFF V4 diagram
P OFF		P ON		Toggle ON/OFF P diagram

Limits correction						
NOTE: the contents of the menu depends on the formula of the active part-program						
aV x		aP x				Absolute limit correction
iV x		iP x				Incremental limit correction
dV x		dP x				Delta limit correction

Edit Part-Program: FORMULA

	Term					Threshold	Operator
Output	**Digital Output signalling**	**Source elaboration**	**Source**	**Channel**	**Compare**		
Limit 1 = Limit 2 = Limit 3 = Limit 4 =	[N] = No Latch [L] = Latch [E] = Edge	[a] = absolute [i] = incremental [d] = delta	V P	1..8	> <	xxx	+ = logical OR with next term . = end
	Term Protection					**Threshold protection**	

Example: The process uses acoustic emission and power sensors simultaneously

Limit 1 = N iV 1 > 30.0 + N iP 1 > 15

Limit 1 is used as GAP ELIMINATION based on incremental value of variable 1 (greater than 30%) OR power channel 1 (greater than 15%). The digital output signal is NO LATCHED (free running)

Limit 2 = L a-- > 0.0

Limit 2 not used

Limit 3 = L aP 1 > 80.0

Limit 3 is used as ANTI-CRASH detection based on the absolute istantaneous value of the power channel 1 (greater than 80%). The digital output signal is LATCHED until the next reset.

Limit 4 = L a-- > 0.0

Limit 4 not used

NOTE: Terms or Thresholds which appears in "reverse mode" are protected by the system installer

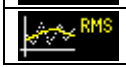
Example: Limit 1 = N iAE 1 > 30.0 + N iP 1 > 15

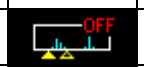
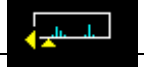
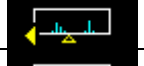
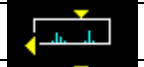
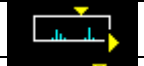
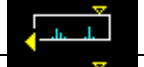
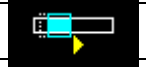
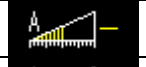
The term "N iP 1 >" is protected and can only be modified by system installer only.

Commands in FORMULA editing

	F1	Lock term or threshold for protection
	F1	Unlock term or threshold for protection

Commands in Power input Setup

		F1		To assign the network address to the power transducers
		F2		Motor power setup [100% = Max power]
		F3		RMS filter setup

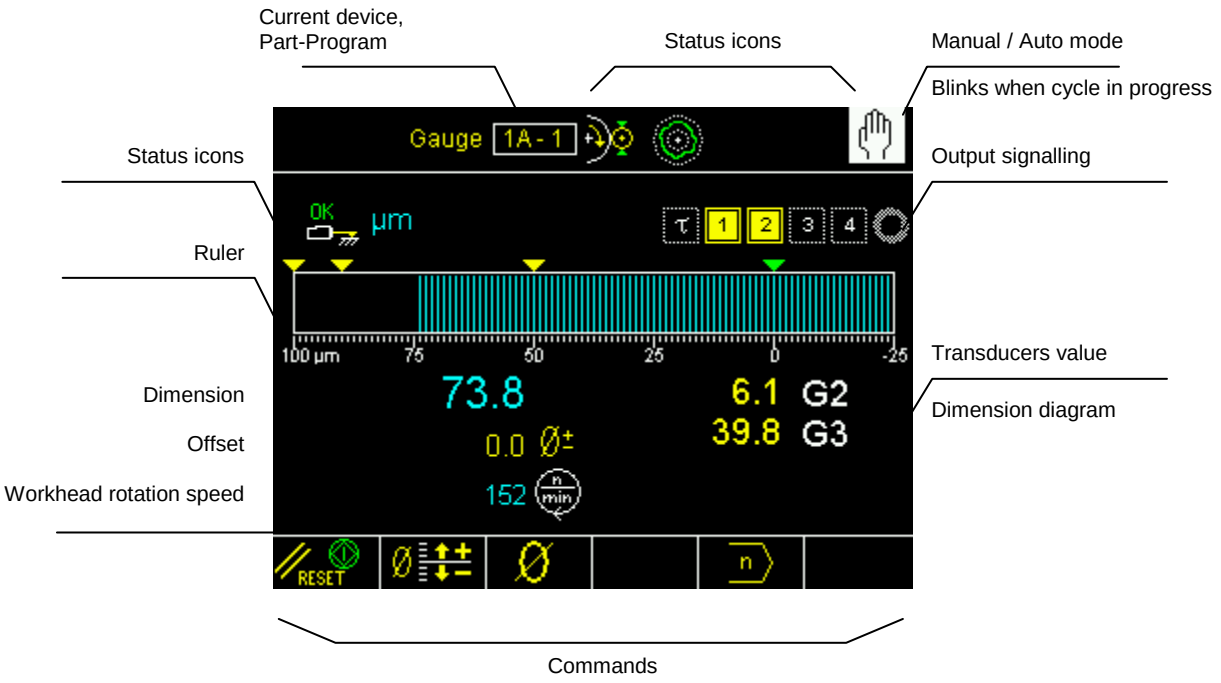
Commands in Vx Variable Setup 						
					F1	Reset status
					F2	Toggle FFT: Free running / Peak detection
					F3	Toggle FFT: Zeroing / Reset zeroing
					F4	Gain of the input signal
					F5	Digital filters setup
			F2		F1	Digtal Band-Pass No.1 setup
			F2		F2	Toggle: Digtal Band-Pass No.1 ON / OFF
					F3	Move down digital high pass filter
					F4	Move up digital high pass filter
					F5	Move down digital low pass filter
					F6	Move up digital low pass filter
			F3		F1	Digtal Band-Pass No.2 setup
			F2		F2	Toggle: Digtal Band-Pass No.2 ON / OFF
					F3	Move down digital high pass filter
					F4	Move up digital high pass filter
					F5	Move down digital low pass filter
					F6	Move up digital low pass filter
					F2	Variable setup: RMS Filter / Fullscale
					F4	Working window selection
					F3	Move down working window
					F4	Move up working window
					F5	Decrease gain in working window
					F6	Increase gain in working window
					F5	Sensor ready check setup

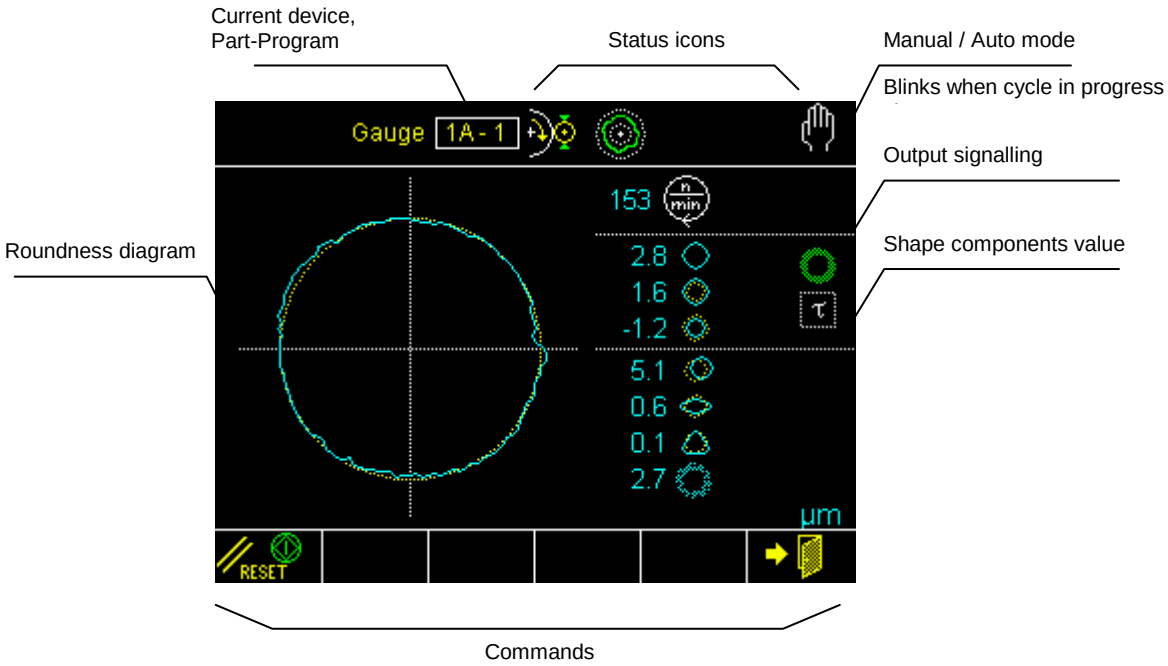
Commands in Parameters Setup				
		F4		To check the wiring of the digital interface [connectors D1 and D2]

Envelope commands in Manual Mode		
RESET	F1	Reset / Enable
	F2	Start process Stop process
	F3	Start learning Stop learning
	F4	Master delete
	F7	Edit mode
Commands in edit mode page		
	F1	Move left and select
	F2	Move right and select
+	F3	Increase top selected
−	F4	Decrease top selected
+	F5	Increase bottom selected
−	F6	Decrease bottom selected
OFF ON	F7	Disable selected Enable selected
−	F1	Decrease top curve
+	F2	Increase top curve
−	F3	Decrease bottom curve
+	F4	Increase bottom curve
	F6	Master save

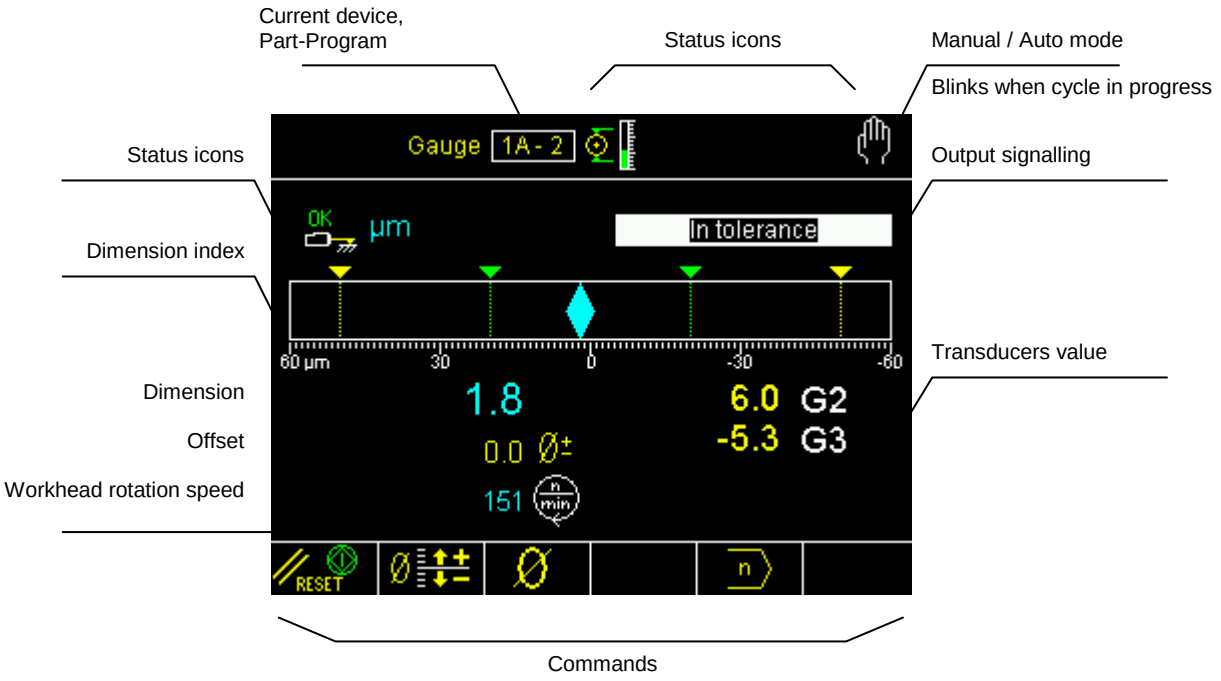
GAUGE [Type GA - NG]

In-Process Gauging and In-Process Gauging with Roundness Analysis

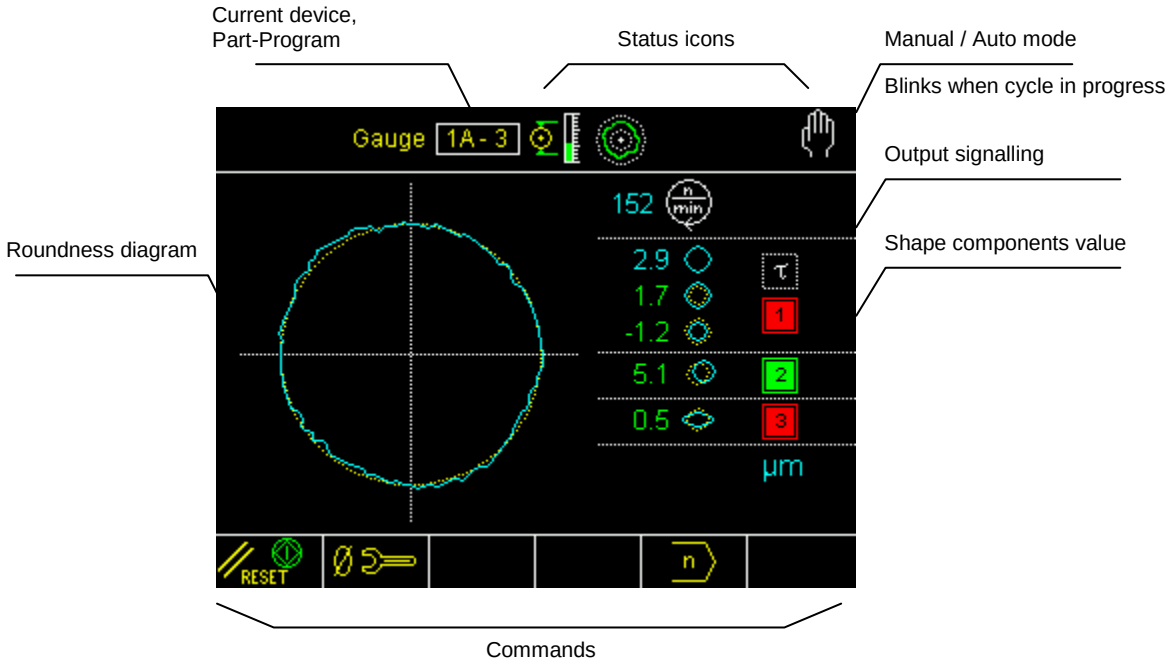




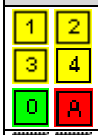
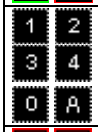
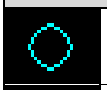
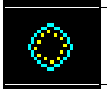
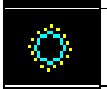
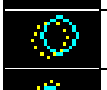
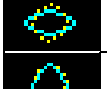
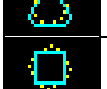
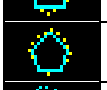
Pre/Post-Process Gauging



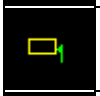
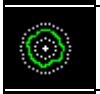
Post-Process Roundness & Shape Analysis



Status icons

Outputs	
	In-Process skip commands activated
	In-Process skip commands resetted
	Post-Process Gauging or Roundness components out of tolerance
	Post-Process Gauging or Roundness components in tolerance
	Start cycle delay expired
	Start cycle delay not expired
	Dwell timer expired
	Dwell timer inactive
	Runout out of tolerance
	Runout in tolerance
	Roundness disabled
Roundness & Shape	
	Runout error
	External deviation
	Internal deviation
	Excentricity
	Ovality
	3-lobe
	4-lobe
	5-lobe
	Residual

Transducers	
	Overrange
	Max measurable dimension
	In gauging position
	Retracted
	ALARM: retraction not executed
	ALARM: retraction hold
	Retraction hold executed

Gauging	
	In-process gauging
	Pre / Post-process gauging
	Flagging
	Roundness & shape analysis
	Measuring unit
	Correction offset value
Dimension	
	Overrange
	Max limit

Commands

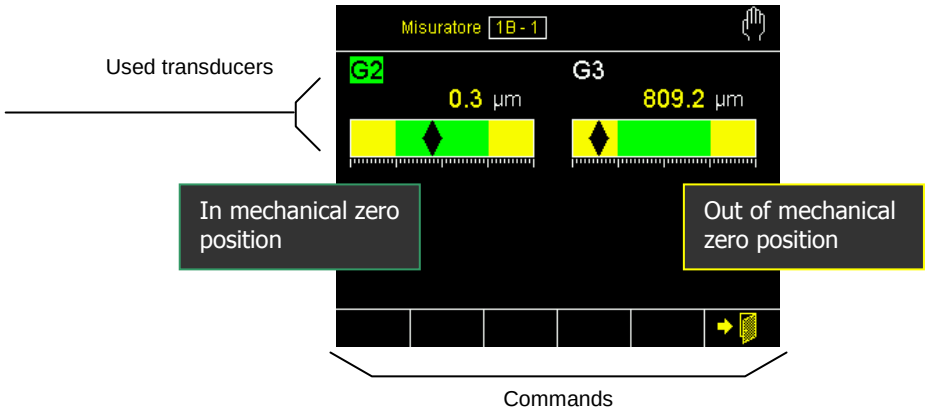
Commands in Automatic mode		
	F1	Offset increment
	F2	Offset decrement
	F3	Offset reset

Commands in Manual mode		
RESET	F1	Signalling reset and start cycle
	F2	Access to offset correction
	F3	Access to zeroing menu
n	F5	Part program change
	F6	Access to roundness and shape analysis

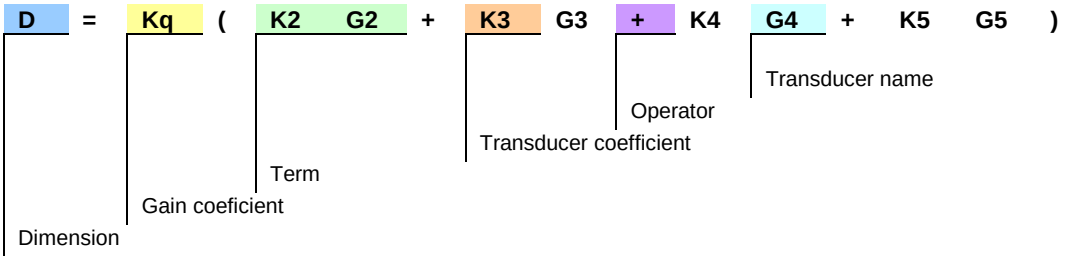
Roundness				
RESET	F1			Signalling reset and start cycle
	F2			Access to mechanical zeroing

Zeroing				
	F1			Access to mechanical zeroing
	F2			Electrical zeroing
	F3			Electrical zeroing reset
MASTER	F4			Master deviation from zero setting

Mechanical zeroing



Part program: MEASURE FORMULA



Transducer name

The four controllable transducers have the following names associated to the card inputs: G2, G3, G4, G5

Transducer coefficient

The role of the coefficient K2..K5 is that of carrying out a weighing correction of the reading done by the transducers. The value of such coefficients depends on the sensitivity and the mechanical construction of the transducer.
Normally the value of these coefficients is imposed at 1.0. It is possible to determine them with the following procedure:

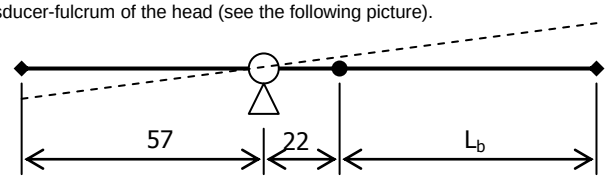
- Execute a zero on a reference surface position
- Insert a master piece with a known thickness, i.e. 0.2 mm, in between the tip and the reference surface;
- Read the displayed dimension, i.e. 0.22 mm
- Calculate the Kx coefficient (related to the current transducer: G2..G5) = Master dimension / Red dimension = 0.2 / 0.22 = 0.9091;
- Repeat this procedure for each transducer used

Operator

Identifies the type of link between the various transducers:
"+" = The reading of the transducer that follows is added
"-" = The reading of the transducer that follows is subtracted
")" = Terminates the formula.

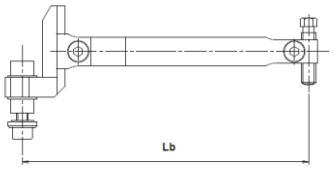
Gain coefficient (finger ratio)

The coefficient Kq determines an equalisation of the quote based on the finger ratio, i.e. the ratio between the distance gauging tip-fulcrum of the head and transducer-fulcrum of the head (see the following picture).



$$Kq = (Lb + 22) / 57$$

where Lb is the finger length.

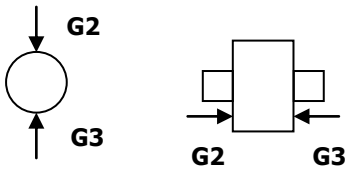


In the following table are displayed the gain coefficient for the standard finger set

Finger ratio	
Finger lenght Lb [mm]	**Kq for Top Gauge 200**
56	1.368
70	1.614
100	2.140
120	2.491

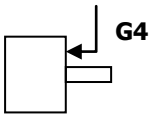
Part program: MEASURE FORMULA (…continue)

Example 1 – Diameter or thickness gauging with G2 and G3 transducer, 70 mm fingers lenght



Formula: D = 1.614 (1.0 G2 + 1.0 G3)

Example 2 – Position gauging using the transducer G4 and 56 mm finger lenght



Formula: D = 1.368 (1.0 G4)

Part program: ROUNDNESS FORMULA

Rnd = **K** **Gx**

Transducer name
Gain coefficient
Roundness dimension

The gauging of roundness is defined by setting a formula, of single term, where one of the four transducers is selected (G2, G3, G4, G5). The structure of the formula is as follows:

Rnd = K Gx where x = 2, 3, 4, 5.

the meaning of coefficient K can be summarised: K = Kq Kx (see measure formula).
The role of coefficient K is that of weighing up the reading made by the transducer. The coefficient value is normally supplied in the technical sheet for the gauging head, since it depends on the sensitivity and mechanical construction of the transducer.

The value of this coefficient can be set using the previously described procedure for the measure formula.

Example: Formula for finger Lb = 70mm : **Rnd = 1.614 G2**

Commands in Gx Transducers setup		
	F1	Connection and recognizing of the TG200 gauging head Every time that a gauging head, TG200-LG type, is connected with the system already on, it is necessary to execute the command for it to be acknowledged. In case, after the command, the corresponding configuration parameters are not displayed on the screen, it means the gauge head is not correctly connected or is faulty

Commands in Parameter Setup 		
	F4	To check the wiring of the DIGITAL INTERFACE [Connettore G1]

Notes: