



### USB INTERFACE BOX

Easy Box™ is a line of interface boxes for easy and economical management via USB port of inductive and incremental transducers, air gauges, Digimatic and serial gauges, I/O signals, thermocouples. It can be used with the MARPOSS compact gauge computers Nemo and Merlin, with the Industrial PC E9066, or with any commercial Personal Computer.

#### AVAILABLE MODELS

- U4F to connect up to 4 MARPOSS standard full-bridge (LVDT) transducers.
- U4F-HR to connect up to 4 MARPOSS standard full-bridge (LVDT) transducers, for applications requiring a very high measurement resolution
- U4H to connect up to 4 MARPOSS standard half-bridge transducers (HBT).
- U4T to connect up to 4 half-bridge transducers (HBT) compatible with amplifiers of TESA.

- U4E to connect up to three incremental transducers such as linear probes, linear and rotary encoders, etc
- U1AIR, U3AIR, U4AIR with adjustable sensitivity and zeroing nozzles to connect one, three, four air transducers respectively.
- U4D to connect up to 4 Digimatic gauges (such as Mitutoyo calipers, digital dial gauges, etc..).
- U4S to connect up to 4 gauges with RS232 output (cable shall feature Cannon 9-pin female connector).
- U4TP-E, U4TP-J, U4TP-K to connect up to four thermocouples type E, J, K respectively
- U8I/O managing 8 Input/Output powered 24Vdc.

#### USB OUTPUT

Both Easy Box™ power supply and transmission to a PC of the measuring values of the connected transducers are realized through the USB port. A single cable is therefore required for both functions. The U4E, U4D and

U8I/O models may require an external additional power feed according to the type of application.

#### APPLICATION FIELDS

The Easy Box™ is suitable for static measurement acquisition or for continuous acquisition where the workpiece is rotated manually or automatically.

#### DATA TRIGGERING

The Easy Box™ continuously provides to the PC (via USB port) the values of the sensors connected to the box.







Whenever a data trigger is necessary, it can be made in the following way:

- With the external signal of a foot-switch connected to the Easy Box™
- With a data request from the host PC
- With the data button available on the Digimatic device (gauge data send button)

#### SOFTWARE PACKAGES

- MARPOSS DLL drivers library for Windows® operating systems, allowing to interface Easy Boxes with any Windows 98® (or higher release) compatible application program with minimum software programming skills.
- Easy Acquisition™ software package for data acquisition and SPC on Excel® worksheets: a complete and easy to operate software package to import data, program measurements, perform data collection and SPC analysis and reporting.
- Quick SPC™ process and quality control software for Windows®, a suite of software products designed to comply with any requirement ranging from simple measurement acquisition to complex gauging applications.

# TECHNICAL SPECIFICATIONS

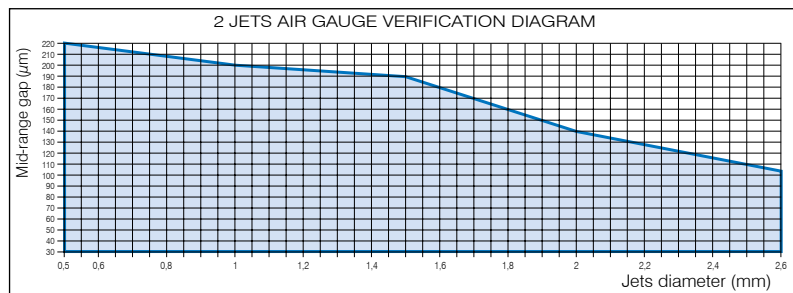
	<b>U4F</b> 	<b>U4F-HR</b> 	<b>U4H</b> 	<b>U4T</b> 	<b>U4E</b> 	<b>U4D</b> 
NUMBER OF INPUT CHANNELS	4	4	4	4	3	4
TYPE OF INPUT CHANNELS	MARPOSS standard Full-Bridge (LVDT)	MARPOSS standard Full-Bridge (LVDT)	MARPOSS standard Half-Bridge (HBT)	Half Bridge (HBT) compatible with Tesa amplifiers	Digital and analog incremental transducers (*)	Mitutoyo Digimatic compatible
PROGRAMMABLE MEASURING RANGES						
NORMAL RANGE	up to ±1000 μm (0.04")	up to ±1000 μm (0.04")	± 250 μm (0.01")/± 1000 μm (0.04")	up to ±2000 μm (0.08")	depending on the transducer used	depending on the Digimatic gauge used
LONG RANGE	up to ±5000 μm (0.20")	up to ±5000 μm (0.20")	± 500 μm (0.02")/± 2000 μm (0.08")	up to ±5000 μm (0.2")		
EXTRA LONG RANGE	-----	-----	± 625 μm (0.025")/± 2500 μm (0.1")	-----		
OUTPUT TYPE	1 x USB 1.1 (connector type B)					
OUTPUT TRANSMISSION SPEED	12 MBit / sec.					
SAMPLING RATE	max. 40 samples /s (up to 1000 samples /s if used with Quick SPC)	max. 40 samples /s (up to 1000 samples /s if used with Quick SPC)	max. 40 samples /s	max. 40 samples /s (up to 1000 samples /s if used with Quick SPC)	max. 40 samples /s (up to 1000 samples /s if used with Quick SPC)	max. 40 samples /s (depending on the Digimatic gauge used)
ACCURACY AT 20° C	± 0,5% of the measuring value ± resolution				depending on the transducer used	depending on the Digimatic gauge used
POWER SUPPLY SOURCE	from USB port				from USB port or external power supply	from USB port or external power supply (**)
CURRENT REQUIREMENT	<350 mA (§§)	<350 mA (§§)	< 100 mA (§)	<350 mA (§§)	<300 mA (§§)	<100 mA (§)
NUMBER OF EASY BOX CONNECTABLE TO ONE USB PORT	Max. 16					
DATA TRIGGERING MODES	external footswitch / host command				external footswitch / host command / RS422/485 signal / 24V optoInsulated input	external footswitch / host command / Data send button on gauge
FOOTSWITCH OPTION	1 input for each box (female connector ø 3,5 mm stereophonic plug on box rear side)				(***)	
PROTECTION DEGREE	IP40 (on front panel) IP30 (on rear panel)					IP30 (on both front and rear panel)
STORAGE TEMPERATURE	-40 / +70° C					
OPERATING TEMPERATURE	0 / +50° C					
DIMENSIONS W x D x H	157 x 90 x 45 mm (6,2" x 3,5" x 1,8")					
WEIGHT	ca. 0.5 kg					








- (\*) Any digital encoder or linear scale featuring differential Line Driver output, 6,4 MHz max. frequency, requiring 5 V power supply. Any voltage analog encoder or linear scale featuring 1 Vpp sinusoidal output, 250 kHz max. frequency, requiring 5 V power supply. Any current analog encoder or linear scale featuring 11 μA output, 250 kHz. max. frequency, requiring 5V power supply, by means of a specific adapter (not included in the supply).
- (\*\*) For any gauge other than Mitutoyo requiring an external power supply.
- (\*\*\*) Common with data control (9-pin D-Sub connector on the rear side).
- (#) Air supply: air must be dry and unooled, filtered to 5 μm and at a pressure of 3 bar (the working range of the converter is 1,5 to 4 bar).
- (§) Max. 4 boxes of this type can be connected to a HUB powered by a USB port. For connection of more than 4 boxes a self-powered HUB is required.
- (§§) To connect more than one box to a HUB a self-powered HUB is required

## U1AIR / U3AIR / U4AIR APPLICATION RANGE

The MARPOSS and/or non-MARPOSS air gauges, with specifications inside the blue area of the diagram, can be easily and immediately connected to these models.. The parameters to be considered are the following:

- air supply pressure
- number of air gauge jets
- diameter of air gauge jets
- "mid-range gap", as to the difference between the mid-tolerance diameter of the part to be measured and the distance between the air gauge jets.



U4S	U1AIR <sup>(#)</sup>	U3AIR	U4AIR	U4TP-E	U4TP-J	U4TP-K
						
4	1	3	4	4	4	4
RS232	Air	Air	Air	Thermocouples Type E	Thermocouples Type J	Thermocouples Type K
depending on the serial gauge used	$\pm 500 \mu\text{m}$ (0.02") ----- -----	$\pm 500 \mu\text{m}$ (0.02") ----- -----	$\pm 500 \mu\text{m}$ (0.02") ----- -----	0 - 100 °C	0 - 100 °C	0 - 100 °C
1 x USB (connector type B) 12 MBit / sec.						
max. 40 samples /s (depending on the serial gauge used)	max. 40 samples /s (up to 1000 samples/s if used with Quick SPC)	max. 40 samples /s (up to 1000 samples/s if used with Quick SPC)	max. 40 samples /s (up to 1000 samples/s if used with Quick SPC)	max. 40 samples /s	max. 40 samples /s	max. 40 samples /s
depending on the serial gauge used	$\pm 0,5\%$ of the measuring value $\pm$ resolution	$\pm 0,5\%$ of the measuring value $\pm$ resolution	$\pm 0,5\%$ of the measuring value $\pm$ resolution	$\pm [0,6^\circ + 0,2\%$ (Tmeas.-T amb.)]	$\pm [0,6^\circ + 0,2\%$ (Tmeas.-T amb.)]	$\pm [0,6^\circ + 0,2\%$ (Tmeas.-T amb.)]
from USB port						
<150 mA (§§)	<350 mA (§§)	<350 mA (§§)	<350 mA (§§)	<200 mA (§§)	<200 mA (§§)	<200 mA (§§)
Max. 16						
external footswitch / host command						
1 input for each box (female connector $\varnothing$ 3,5 mm stereophonic plug on box rear side)						
IP40 (on front panel) IP30 (on rear panel)						
-40 / +70° C 0 / +50° C						
157 x 90 x 65 mm (6,2" x 3,5" x 2,6")	157 x 103 x 65 mm (6,2" x 4,05" x 2,6")	224 x 159 x 150 mm (8,82" x 6,26" x 5,90")	224 x 159 x 150 mm (8,82" x 6,26" x 5,90")	157 x 90 x 45 mm (6,2" x 3,5" x 1,8")		
ca. 0.6 kg	ca. 1 kg	ca. 2,8 kg	ca. 3,8 kg	ca. 0.5 kg		

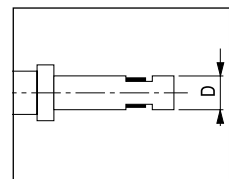
### EXAMPLE OF MEASUREMENT WITH AIR-PLUG

- air supply pressure: 3 bar  $\pm$  0.1
- number of jets : 2
- diameter of jets: 2mm (.0787")
- diameter of the part to be measured = 10 mm  $\pm$  0.030 (.3937"  $\pm$  .0012")
- mid tolerance diameter = 10 mm (.3937")
- distance between the jets D = 9.90 mm (.3898")

We obtain:

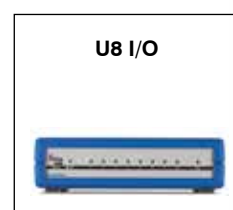
- "mid tolerance gap": (10 - 9.90) = 0.10 mm = 100  $\mu\text{m}$

As shown in the diagram the intersection between the value of the "mid-range gap", 100  $\mu\text{m}$  (.0039"), and the diameter of the jet, 2 mm (.0787"), stays inside the blue area: the application can be therefore realized.



### I/O MODEL

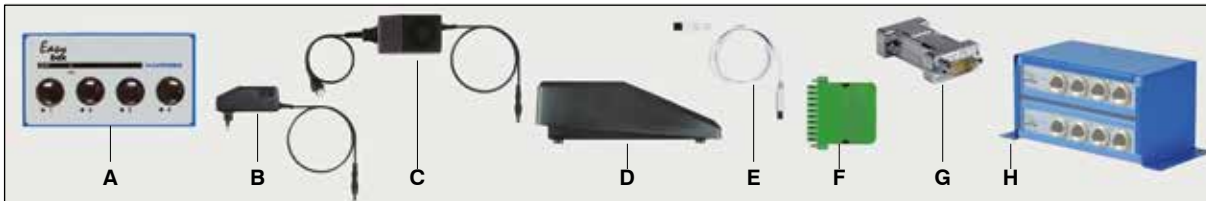
- 8 optoinsulated 24Vdc Input/Output, each free configurable as Input, Output or Input/Output.
- sink or source type I/O's (not in mix); the selection is made by means of a switch located on the rear side of the box
- output current for each Output can be (according to EN61131-2 Standard for Outputs in direct current at 24Vdc):  
max. 100 mA by use of 8 Outputs  
max. 250 mA by use of 4 Outputs  
max. 500 mA by use of 2 Outputs (available only for source type Output)
- The power supply for the Outputs (24Vdc for source outputs, 0V for sink outputs) can be interrupted for safety reasons without compromising the working of the Inputs.



# HOW TO ORDER

DESCRIPTION	ORDER CODE
EASY Box U4F WITH 4 MARPOSS STANDARD LVDT INDUCTIVE INPUTS	6871250021
EASY Box U4F-HR (HIGH RESOLUTION) WITH 4 MARPOSS STANDARD LVDT INDUCTIVE INPUTS	6871250022
EASY Box U4H WITH 4 MARPOSS STANDARD HBT INDUCTIVE INPUTS	6871250000
EASY Box U4T WITH 4 HBT INDUCTIVE INPUTS COMPATIBLE WITH AMPLIFIERS OF TESA	6871250030
EASY Box U4E WITH 3 INCREMENTAL TRANSDUCER INPUTS	6871250090
EASY Box U1AIR WITH 1 AIR TRANSDUCER INPUT	6871250101
EASY Box U3AIR WITH 3 AIR TRANSDUCER INPUTS	6871250111
EASY Box U4AIR WITH 4 AIR TRANSDUCER INPUTS	6871250122
EASY Box U4D WITH 4 DIGIMATIC INPUTS	6871250012
EASY Box U4S WITH 4 RS232 INPUTS	6871250060
EASY Box U4TP-E WITH 4 THERMOCOUPLE INPUTS TYPE E	6871250080
EASY Box U4TP-J WITH 4 THERMOCOUPLE INPUTS TYPE J	6871250083
EASY Box U4TP-K WITH 4 THERMOCOUPLE INPUTS TYPE K	6871250086
EASY Box U8I/O WITH 8 INPUT/OUTPUT	6871250050

## ACCESSORIES



REF.	DESCRIPTION	ORDER CODE
A	EASY Box U4P PUSHBUTTON BOX FOR REMOTE CONTROL OF DATA ACQUISITION, ZEROING, ETC. WITH EASY ACQUISITION AND QUICK SPC SOFTWARE	6871250070
B	POWER SUPPLY UNIT FOR EASY Box U4D, WITH EU PLUG (*)	6871140155
	POWER SUPPLY UNIT FOR EASY Box U4D, WITH U.S.A. PLUG (*)	6871140156
	POWER SUPPLY UNIT FOR EASY Box U4D, WITH U.K. PLUG (*)	6871140157
B	POWER SUPPLY UNIT FOR EASY Box U8I/O, WITH EU PLUG (**)	6871140133
	POWER SUPPLY UNIT FOR EASY Box U8I/O, WITH U.S.A. PLUG (**)	6871140134
	POWER SUPPLY UNIT FOR EASY Box U8I/O, WITH U.K. PLUG (**)	6871140135
C	POWER SUPPLY UNIT FOR EASY Box U4E, WITH EU MAINS CABLE	6871140170
	POWER SUPPLY UNIT FOR EASY Box U4E, WITH U.S.A. MAINS CABLE	6871140171
C	POWER SUPPLY UNIT FOR EASY Box U4D, WITH EU MAINS CABLE (*)	6871140158
	POWER SUPPLY UNIT FOR EASY Box U4D, WITH U.S.A. MAINS CABLE (*)	6871140159
C	POWER SUPPLY UNIT FOR EASY Box U8I/O, WITH EU MAINS CABLE (**)	6871140136
	POWER SUPPLY UNIT FOR EASY Box U8I/O, WITH U.S.A. MAINS CABLE (**)	6871140137
D	FOOTSWITCH WITH 2 m CABLE FOR DATA TRIGGERING FUNCTION (NOT FOR EASY Box U8I/O)	6131000110
E	USB CABLE L= 1 m (TYPE A-B) FROM EASY BOX TO THE PC USB PORT	4701300229
	USB CABLE L= 3 m (TYPE A-B) FROM EASY BOX TO THE PC USB PORT	4701300230
F	CABLE TERMINAL FOR 10 PIN CONNECTOR OF EASY Box U8I/O (ONE PIECE IS ALWAYS SUPPLIED IN THE PACKAGING WITH THE EASY Box)	6872010015
G	INTERFACE ADAPTER FOR CONNECTING ANALOG CURRENT TRANSDUCERS FEAT. 11 $\mu$ A OUTPUT TO EASY Box U4E	6303540800
H	PROTECTIVE AND FIXING CASE FOR 1 EASY Box TYPE U4F, U4F-HR, U4H, U4T, U4E, U4D, U4TP-E, U4TP-J, U4TP-K, U8I/O	1502050600
	PROTECTIVE AND FIXING CASE FOR 1 EASY Box TYPE U1AIR OR U4S	1502050601
	PROTECTIVE AND FIXING CASE FOR 2 EASY Box TYPE U4F, U4F-HR, U4H, U4T, U4E, U4D, U4TP-E, U4TP-J, U4TP-K, U8I/O	1502050610
	PROTECTIVE AND FIXING CASE FOR 3 EASY Box TYPE U4F, U4F-HR, U4H, U4T, U4E, U4D, U4TP-E, U4TP-J, U4TP-K, U8I/O OR 2 EASY Box TYPE U1AIR OR U4S	1052050620

(\*) For any gauge other than Mitutoyo requiring an external power supply.

(\*\*) This power supply is not required if the Easy Box U8I/O is exclusively configured with inputs or when the box is connected to an alternative 24V power supply.

For a full list of address locations, please consult the Marposs official website

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