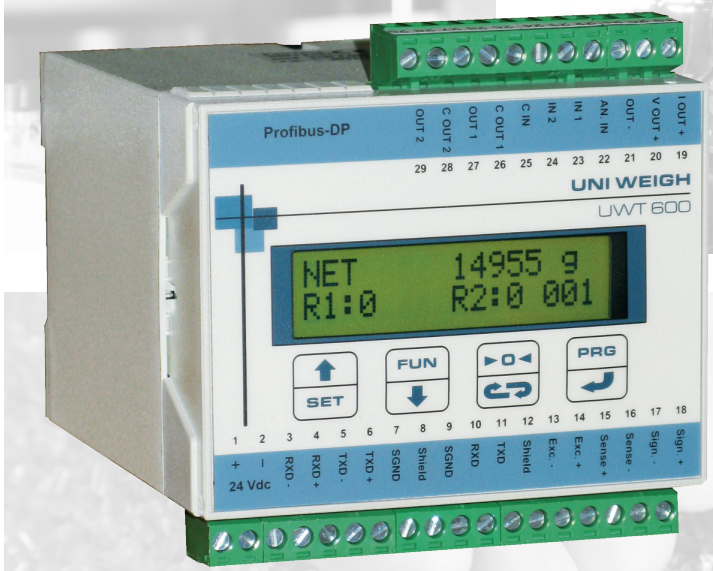
TECHNICAL MANUAL



UWT 600 Serial and analog weighing Indicator/Trasnmitter

Software versione PRG 002 R 0.9

PAVONESYSTEMS

CONTENTS

TECHNICAL SPECIFICATIONS

Power supply:	24 Vdc ± 15%; 10 Watts
Environmental:	
Temperature (outside air):	-10°C to +50°C (14° to +122°F)
Storage temperature:	-20°C to +60°C (-4° to +140°F)
Relative humidity:	85% non condensing
Front panel:	
Display:	LCD, alphanumeric, back lighted, 2 x 16 (32) characters, 5 mm. high
Keyboard:	(4) keys, tactile feedback
Performance:	
Load cells excitation voltage:	5 volts, short circuit proof
Load current:	120mA, up to 8 x 350Ω load cells
A/D Converter	24 bit (over 16,000,000 counts)
A/D Conversion rate:	50 updates/second (or higher)
Signal input range:	-1.5 mV/V to 3.5 mV/V
Input sensitivity:	0.02 µV/count
Linearity:	better than 0.01% of full scale
Temperature effect on zero:	up to 40°C < 0.0002% /°F; over 40°C up to 50°C < 0.0006% of rdg /°C
Temperature effect on span:	up to 40°C < 0.0003% of rdg /°C; over 40°C up to 50°C < 0.0015% of rdg /°C
Reading update:	50/sec.
Filter:	0.1Hz to 25Hz selectable
Decimal point:	0.0 - 0.00 - 0.000
Calibration methods:	with test certificates, table (mV/capacities), sample weights
Configuration:	via the 4 front panel keys or via the PC through the “CalEasy” software utility supplied with the instrument
Inputs & outputs:	
Digital inputs:	2 opto-isolated, 24 Vdc PNP
Relay outputs:	2 mechanical relays (dry contacts n.o.) - 115 Vac / 30 Vdc, 0.5A
Serial outputs:	
Serial outputs:	COM1 RS232 half duplex (cable length: 15m - 50 feet) COM2 RS422/485 half duplex (cable length: 1000m - 3300 feet)
Standard protocols:	ASCII, Modbus RTU
Baud rate:	1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200 selectable
Enclosure:	
Overall dimensions:	100 x 75 x 110 mm (W x D x H) - 4” x 3” x 4.4”
Mounting:	DIN rail
Material:	ABS plastic
Protection:	IP54 (front panel)
Weight:	400 gr. (14 oz.)
Wiring connections:	plug in terminal blocks, screw terminals
CE conformity:	EN61000-6-2, EN61000-6-3 for EMC EN61010-1 for Electrical Safety
OPTIONS:	
Profibus-DP, DeviceNet or Ethernet Protocol:	takes the place of the RS422/485 COM2 port
External Serial SC600 Converter:	converts any of the RS232 or RS422 serial outputs into the other.
Memories:	
Code programme:	128kbytes Flash (reprogrammable through the RS232 COM1)
Data:	4 kbytes with expansion capability up to 32kbytes
Analog output:	
Type:	16 bit D/A conversion
Voltage:	0 - 5 V / 0 - 10 V (10 kΩ min load)
Current:	0 - 20 mA / 4 - 20 mA (300 Ω max load)
Linearity:	better than 0.03 of F.S.
Temperature creep:	better than 0.001% of F.S./°C
Optional analog input:	
Voltage;	0 - 10 Vdc
Resolution:	10 bit

UWT 600 Ordering Information

The UWT 600 can be delivered in the following 8 configurations:						
MODEL	**COM1 RS232C**	**COM2 RS422/485**	**Analog output, two inputs and two relay outputs**	**Profibus-DP**	**DeviceNet**	**Ethernet**
UWT 600	●	●				
UWT 600/A	●	●	●			
UWT 600/P	● (*)			●		
UWT 600/PA	● (*)		●	●		
UWT 600/DN	● (*)				●	
UWT 600/DNA	● (*)		●		●	
UWT 600/E	● (*)					●
UWT 600/EA	● (*)		●			●

(*)
The optional SC 600 serial converter can be ordered to convert the RS232 into RS422/485 for solving a distance problem or for any reason of serial outputs connections management.

INTRODUCTION

The UWT 600 is a high performance transmitter incorporating the most recent advanced technology to meet demand of Industrial Weighing Applications.

During normal operation the weight or force value and the status of the relays are displayed in the front window.

The transmitter supplies up to 8x350 Ω load cell(s) with the excitation voltage and converts the analog input signal into a digital measurement with very high resolution (24 bits - over 16 million counts).

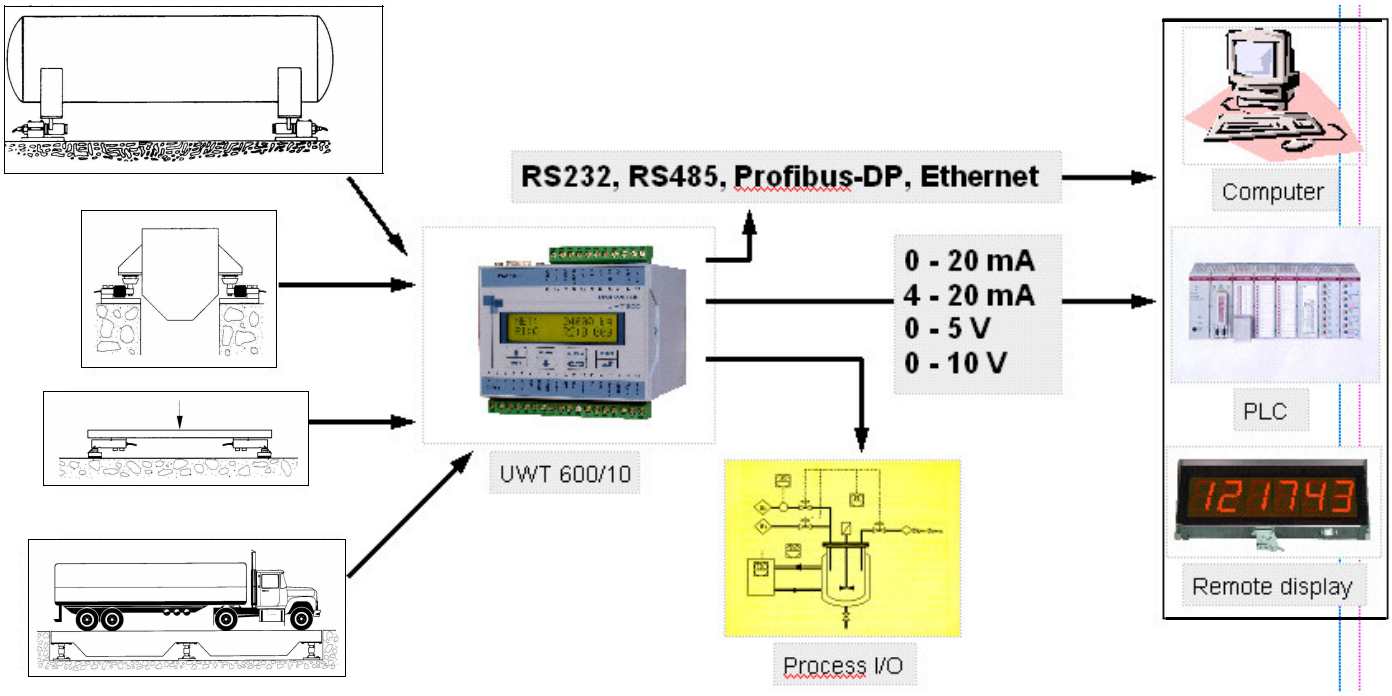
Actual parameters are used to configure the transmitter using the four front panel keys or via a PC with the CalEasy software, a Windows based program supplied on a CD.

Analog output and two setpoints are standard on any model.

The UWT 600 has two serial ports and networking capabilities via the ASCII, Modbus RTU and optional Profibus-DP or Ethernet communication protocols.

The Modbus network can be used for parameter set-up, calibration and supervision of the two output relays.

The intelligent "Self Guard" internal supervision software prevents both unauthorized interventions and unwanted calibration mistakes.



EC DECLARATION OF CONFORMITY

CE

We: **Pavone Sistemi Srl**
Via dei Chiosi, 18
Cavenago Brianza (MI)

Hereby declares that the product: **UWT 600** Weight Indicator & Analog Digital Transmitter complies with the essential requirements of the directives 73/23/CEE, 89/336/CEE, 93/68/CEE, when used for its intended purpose

The instrument is manufactured and tested in accordance with the following standards:

ELECTROMAGNETIC COMPATIBILITY:

EN 61000-6-2
EN 61000-6-3

ELECTRICAL SAFETY:

EN 61010-1

The CE mark has been applied on the product

Cavenago, April 27th, 2004

The Manager

INSTALLATION

Mounting

The UWT 600 snaps mount on a 35 mm. wide DIN rail. The Profibus-DP cable connects to a 9 pin sub-D connector, the DeviceNet cable connects to a 5 pin plug-in terminal block, the Ethernet cable connects to a RJ 45 connector, while all other cables connect to the plug-in terminal blocks. Inputs and outputs of the UWT 600 are isolated for circuit protection.
Install the instrument in a location where it will not be subjected to excessive heat, humidity or vibration. For best results, avoid direct sunlight on the front of the instrument. The unit should be installed at eye level so as to allow viewing the display and access to the front panel keys.

Power and Wiring Considerations

The instrument is powered from an external 24 Vdc source. The instrument can be operated from a computer, a PLC or an external Profibus, DeviceNet, Modbus or Ethernet network. Therefore, a “clean”, isolated power source is required for reliable operation.

Cables carrying primary and switched power should be routed away from the load cell and other signal cables to avoid electrical interference.

Relays, motor starters and other inductive devices connected to the equipment must have reliable and effective arc suppression.

Always connect the shield lead where indicated on the drawing, and on one end only.

High voltage devices such as megohmmeters, etc. should *never be used* to check the wiring connections.

Plastic insulating tape should not be used on the load cell connections.

Environmental Considerations

Heavy electrical equipment should not be installed close to the weighing equipment.

Excessive vibration will affect the accuracy of the weigh system and depending on the severity can cause damage to electrical and electronic components.

The atmosphere should be dust free and not contain any corrosive gasses or materials which could adversely affect the equipment.

Hazardous areas

If the weighing system is to be installed in a hazardous area, please contact the factory for the appropriate Zener Barriers connections.

NOTES:

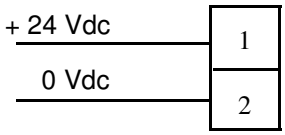
Electrical ARC WELDING on or in the vicinity of the load cells is **strictly prohibited.**

STATIC loads, caused by thunderstorms, must be prevented from developing by using reliable lightning conductors.

ENSURE that the cooling of the equipment is not obstructed.

ELECTRICAL CONNECTIONS

POWER SUPPLY



Terminals 1 and 2
Power the UWT 600 with 24 Vdc.
Uni Weigh supplies rail mounted power supplies 100-240 Vac to 24 Vdc

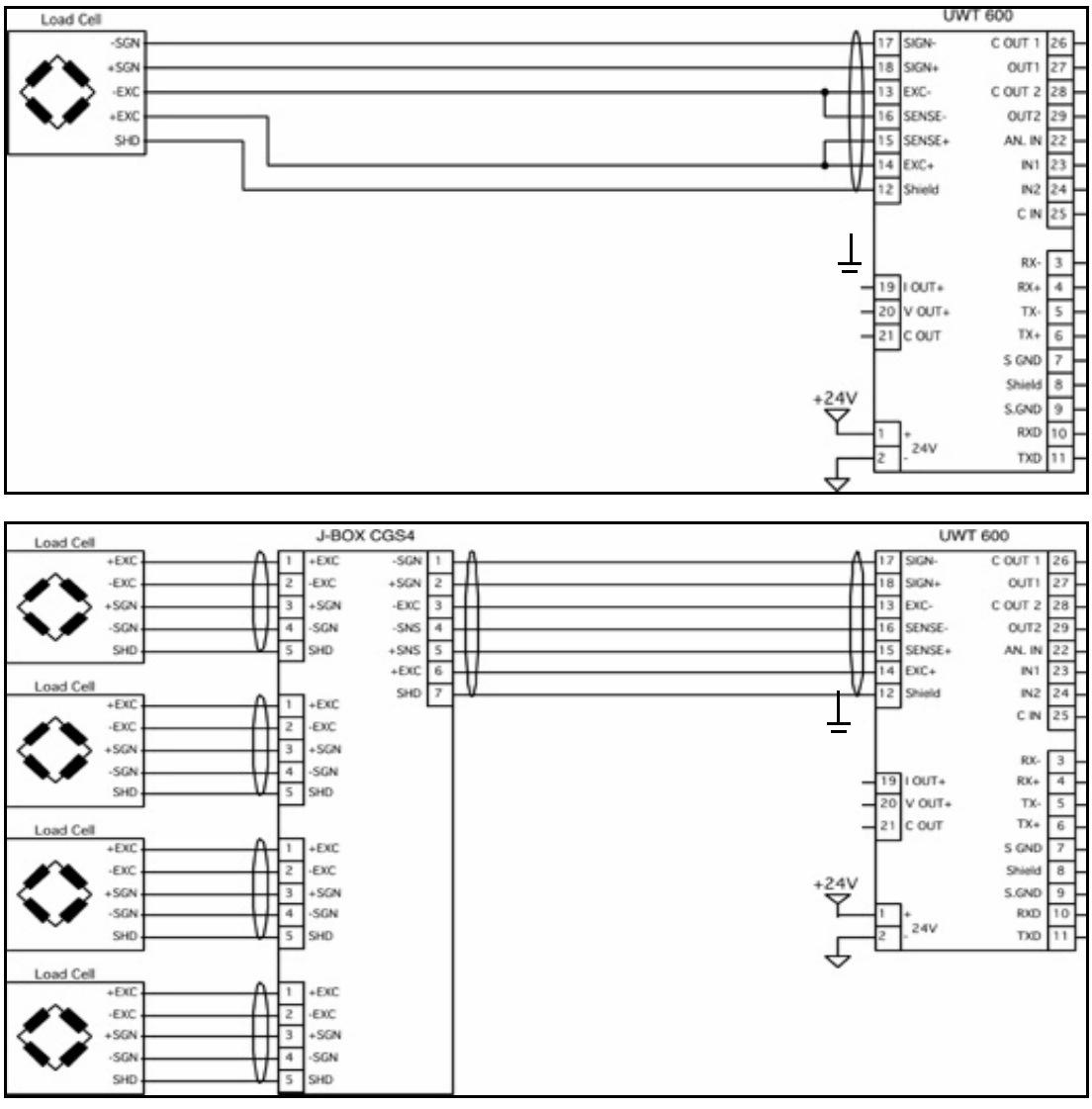
LOAD CELLS CONNECTIONS

Terminals 13 to 18
The transducers connection should be handled with great care to achieve good measurement data.
Do not shorten the load cell cable and run it separate from power cables.

The UWT 600 terminal board is designed for 4-wire or 6-wire transducers.

The 4-wire connection is to be used when the load cell cable can be directly connected to the UWT 600 terminals: excitation and sense wires must be interconnected as shown in the figure below.
Ground the shield and terminal 12 at one side only by the DIN mounting rail.

The 6-wire connection is to be used when the load cell cable needs to be lengthened or when several transducers are connected through the CGS 4 Junction Box.
Use a 6-wire shielded cable between the junction box and the UWT 600 as shown in the figure below.
Ground the shield and terminal 12 at one side only by the DIN mounting rail. Up to 8 load cells can be connected to the UWT 600 through the CGS 8 J-Box.

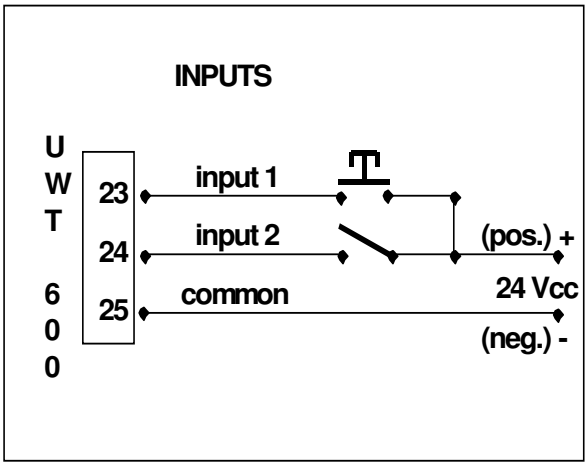


N.B. Connect the load cell shield to terminal 12. Ground the load cell shield on one end only.

DIGITAL INPUTS

Terminals 23, 24, 25
The two opto-isolated input signals must be powered by an external 24 Vdc source.
The cables should be as short as possible and run separate from power cables.

The figure on the right shows two typical inputs: a push button and a switch.
The inputs activate when the +24 Vdc is supplied to the terminals 23 and/or 24.
The number 1 input performs different functions according to the selected instrument operating mode listed below.
The number 2 input just starts the serial transmission in any operating mode.



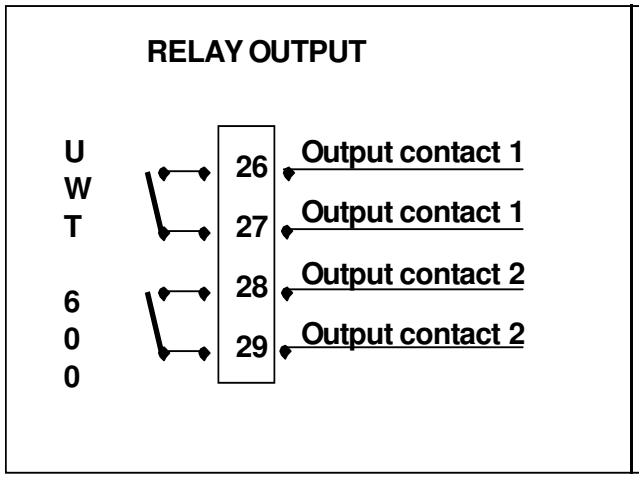
COMMAND	*INSTRUMENT OPERATING MODE*	*FUNCTION*
INPUT 1	Gross	Zero setting
	Net	Tare
	Peak	Reset
INPUT 2	Any of the above	Start of the serial transmissions

RELAY OUTPUT (2)

Terminals 26-27 and 28-29
The relays contacts are NO and change their status when the set point value is reached.
Contact rating is 0.5A / 24Vdc or 115Vac.

The relay output can be configured in several ways: see “Relay output configuration” page 21.

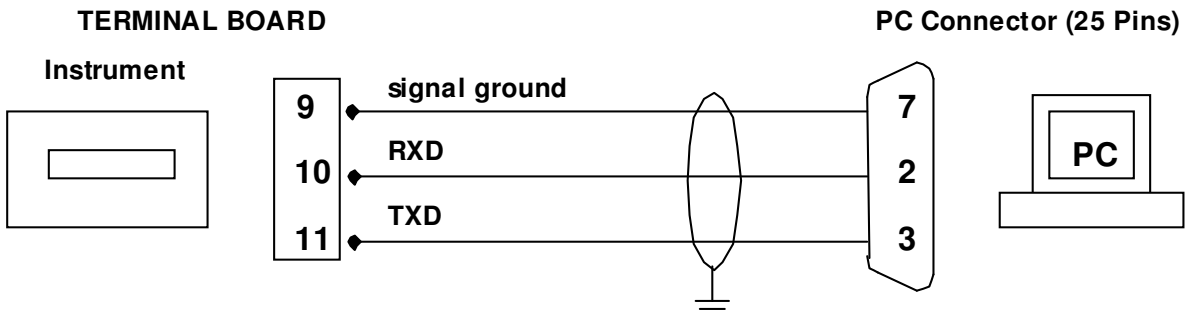
The figure below shows the output connections.

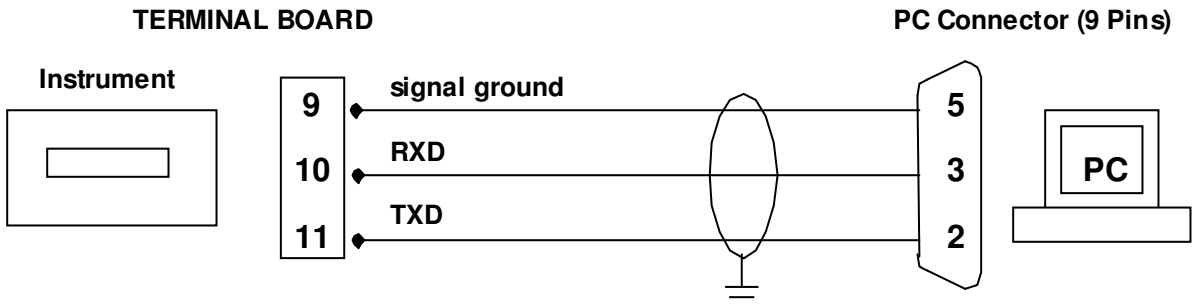


RS 232 SERIAL COMMUNICATION WITH PCs

Terminals 9, 10, 11
Use a shielded 3-wire cable and connect the shield to the instrument terminal number 8 or ground it at the PC side.
Connect to the shield any excess wire.
The maximum allowable cable length is 15 meters (50 feet).
Run this cable separate from any other.
Make sure that the PC conforms to the EN 60950 norms.

The following diagrams show the connection of the UWT 600 to a PC equipped with a 25 pins Sub-D connector or a 9 pins Sub-D connector:





RS422 / RS485 SERIAL CONNECTIONS

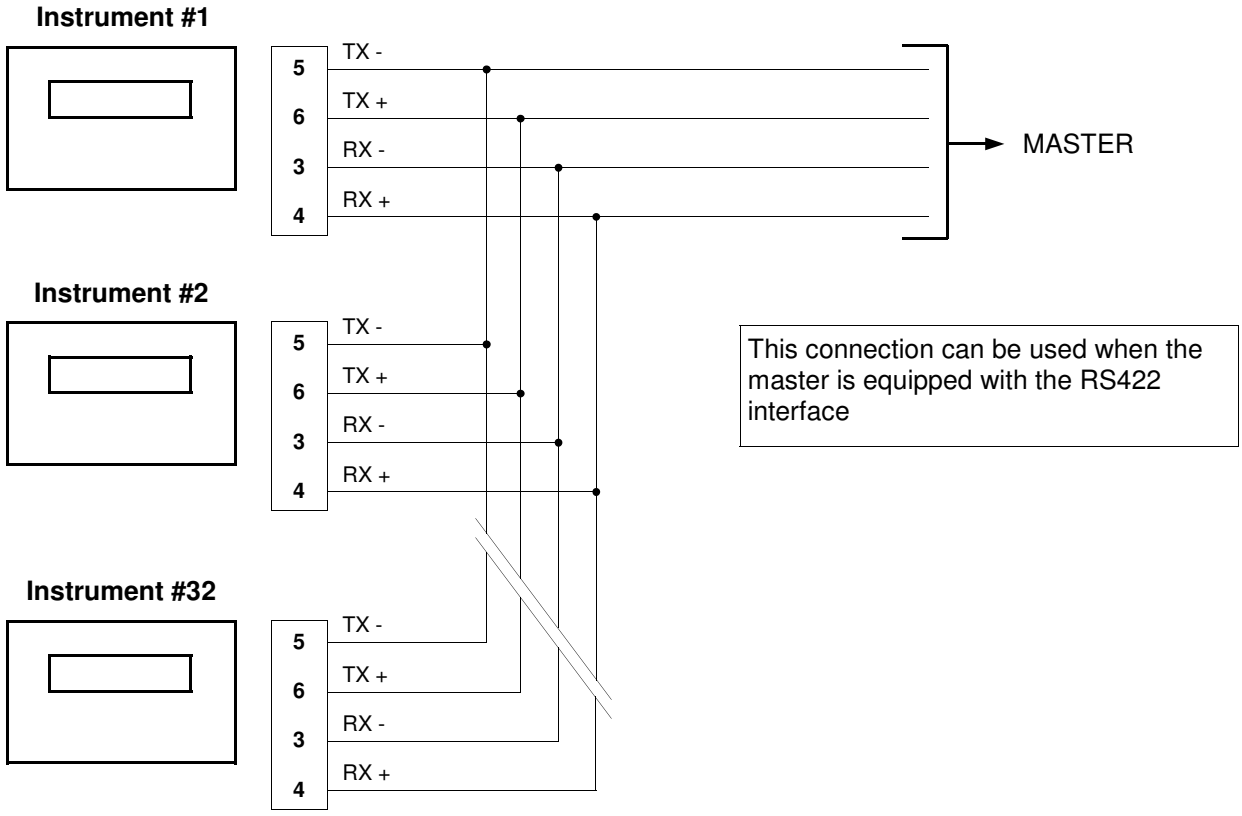
NOTE: The RS422 / RS485 serial port is NOT AVAILABLE when the instrument is equipped with the Profibus-DP, DeviceNet or Ethernet options.

The RS 422/RS485 serial transmission allows up to 1000 meters of cable length and a connection of up to 32 UWTs to a MASTER unit such as a PC (Personal Computer), a PLC (Programmable Logic Controller) or to a DCS (Distributed Control System).

Use a dedicated serial communication cable: one twisted pair for RS485, two for RS422.

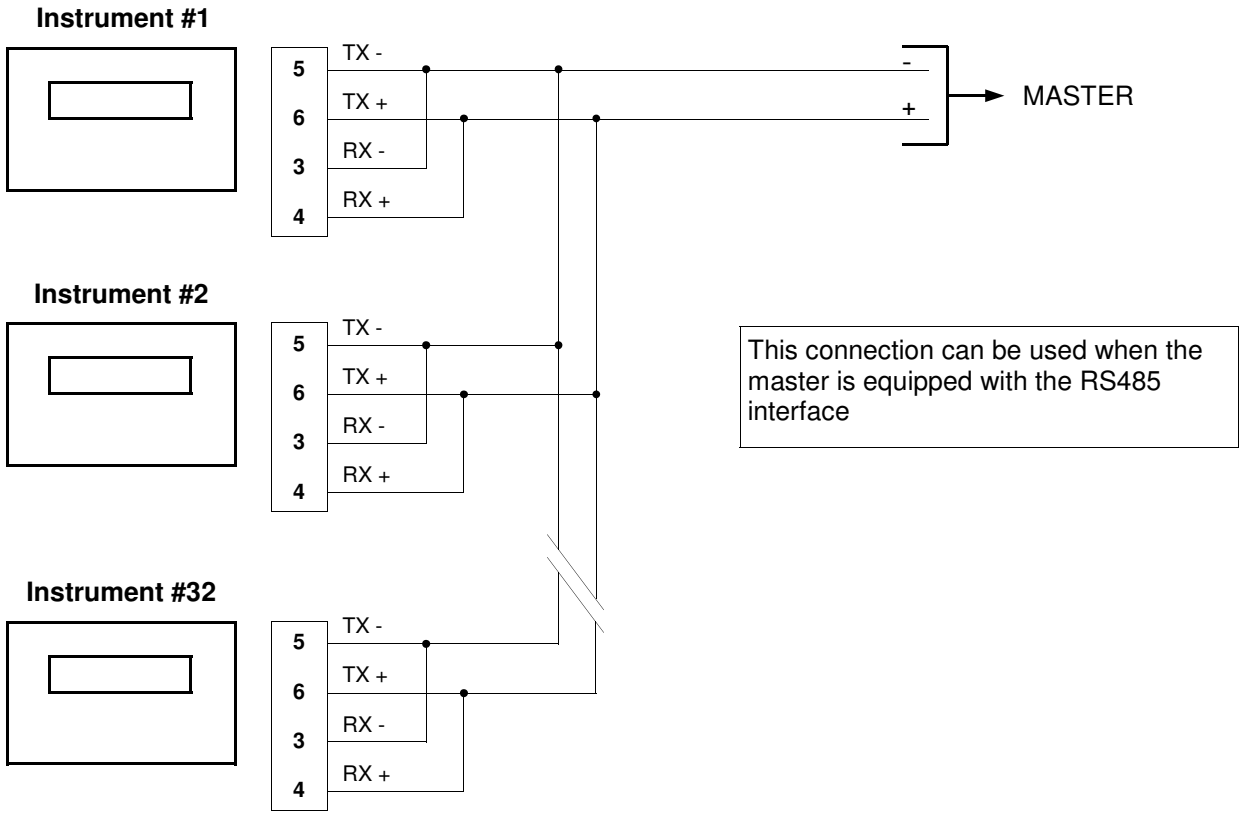
The connections are shown on the following page

RS422 OUTPUT



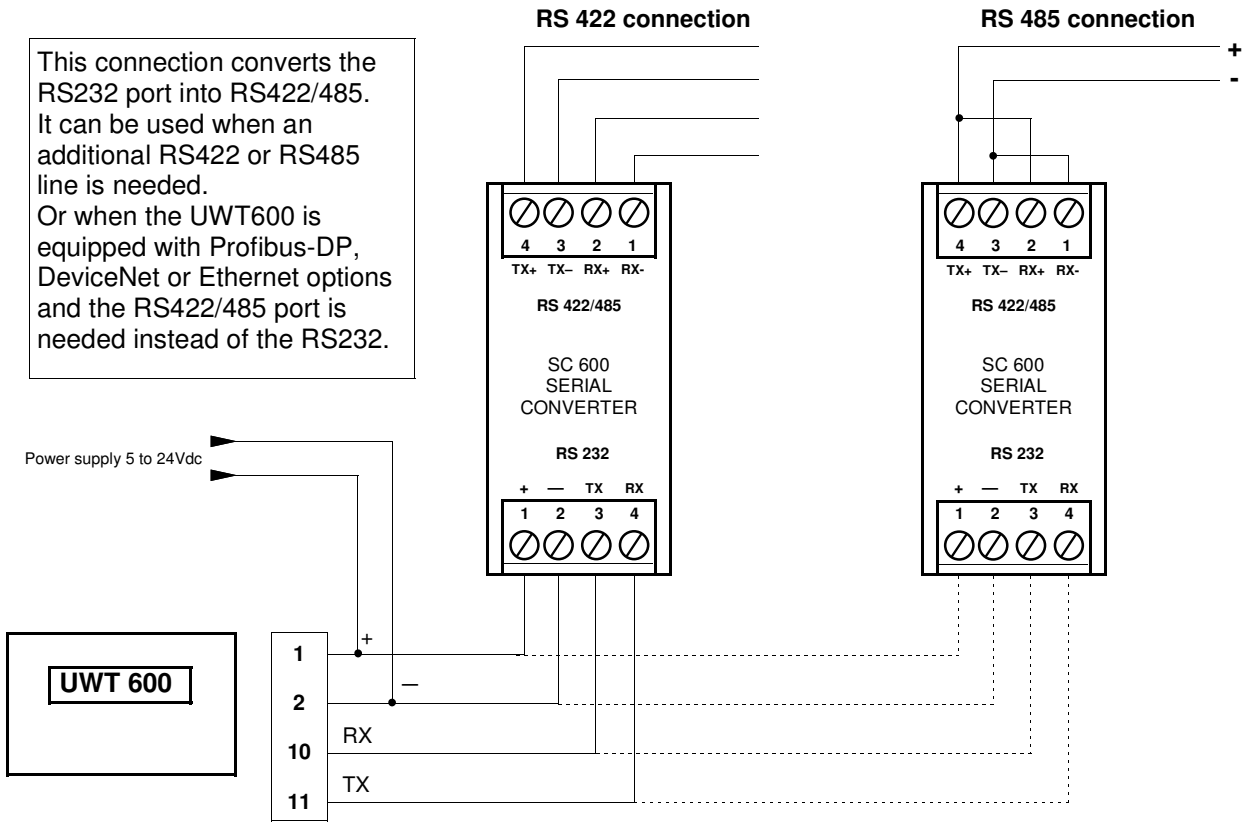
This connection can be used when the master is equipped with the RS422 interface

RS485 OUTPUT

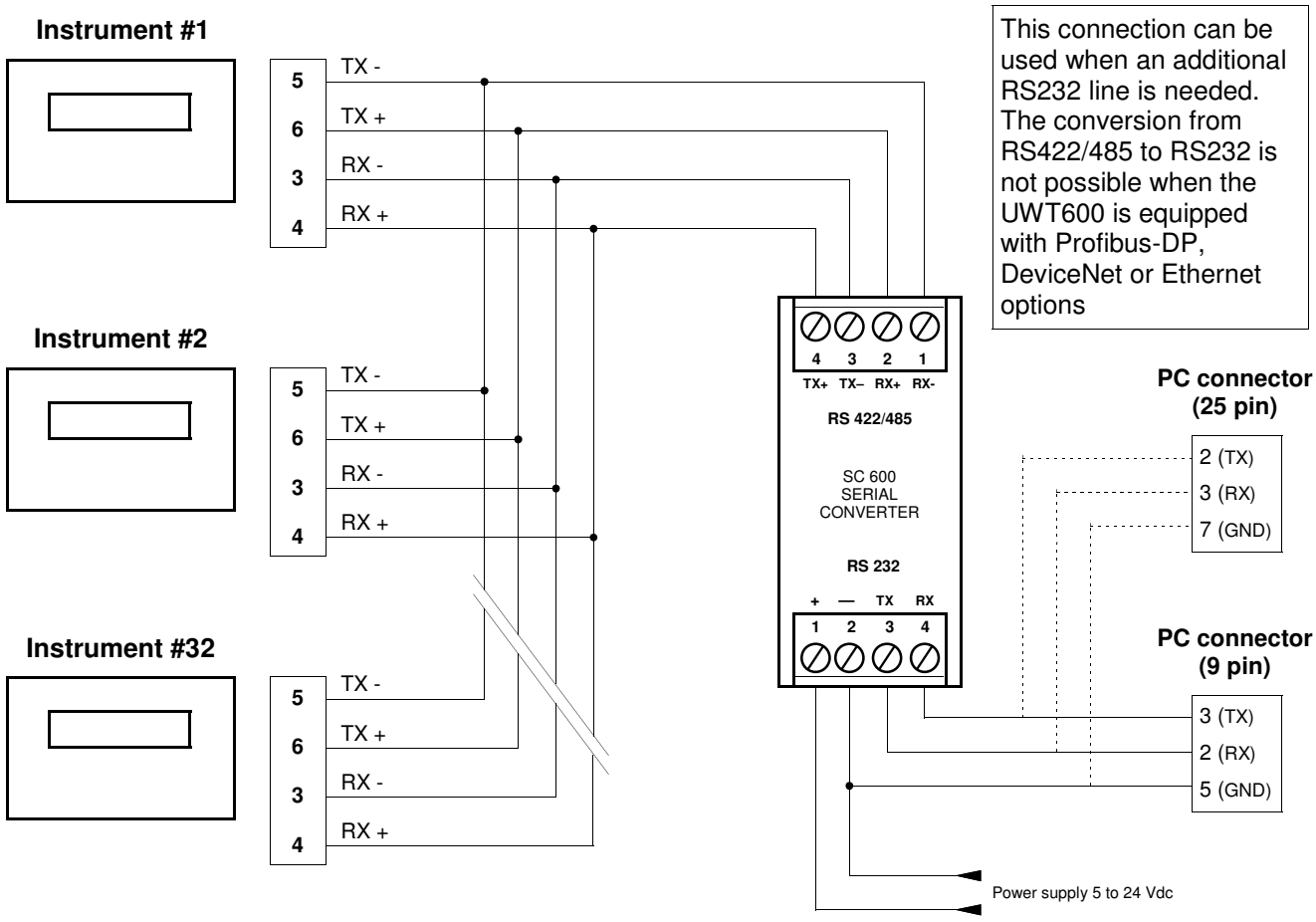


This connection can be used when the master is equipped with the RS485 interface

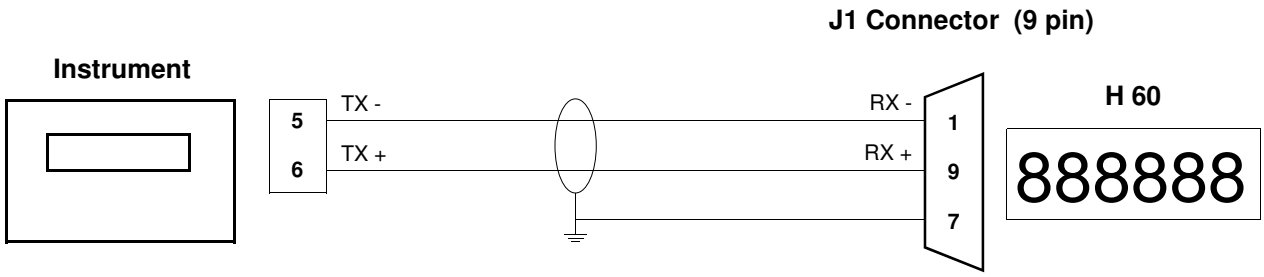
RS422 or RS485 OUTPUT THROUGH THE SERIAL CONVERTER (OPTIONAL PART NUMBER SC 600 SUPPLIED BY UNI WEIGH)



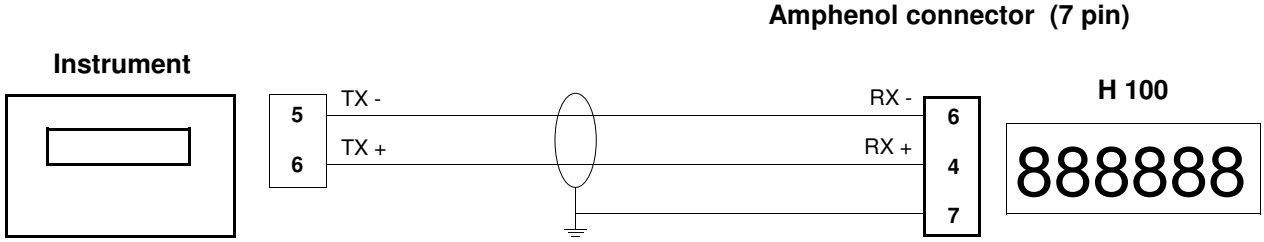
RS232 OUTPUT THROUGH THE SERIAL CONVERTER (PART NUMBER SC 600 SUPPLIED BY UNI WEIGH)



RS485 CONNECTION TO THE UNI WEIGH H60 REMOTE DISPLAYS - 60 mm. high digits (2.4")



RS485 CONNECTION TO THE UNI WEIGH H100 REMOTE DISPLAYS 100 mm. high digits (4")



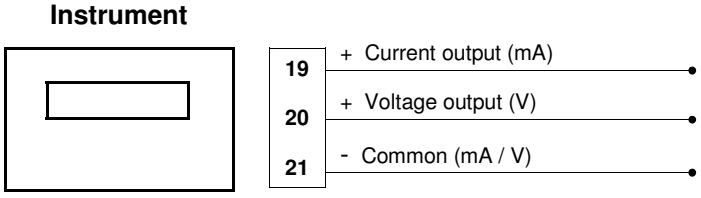
NOTE:	**The RS485 connection to remote displays is NOT AVAILABLE when the instrument is equipped with the Profibus-DP, DeviceNet or Ethernet options.**

ANALOG OUTPUT CONNECTION (optional)

Terminals 19, 20, 21

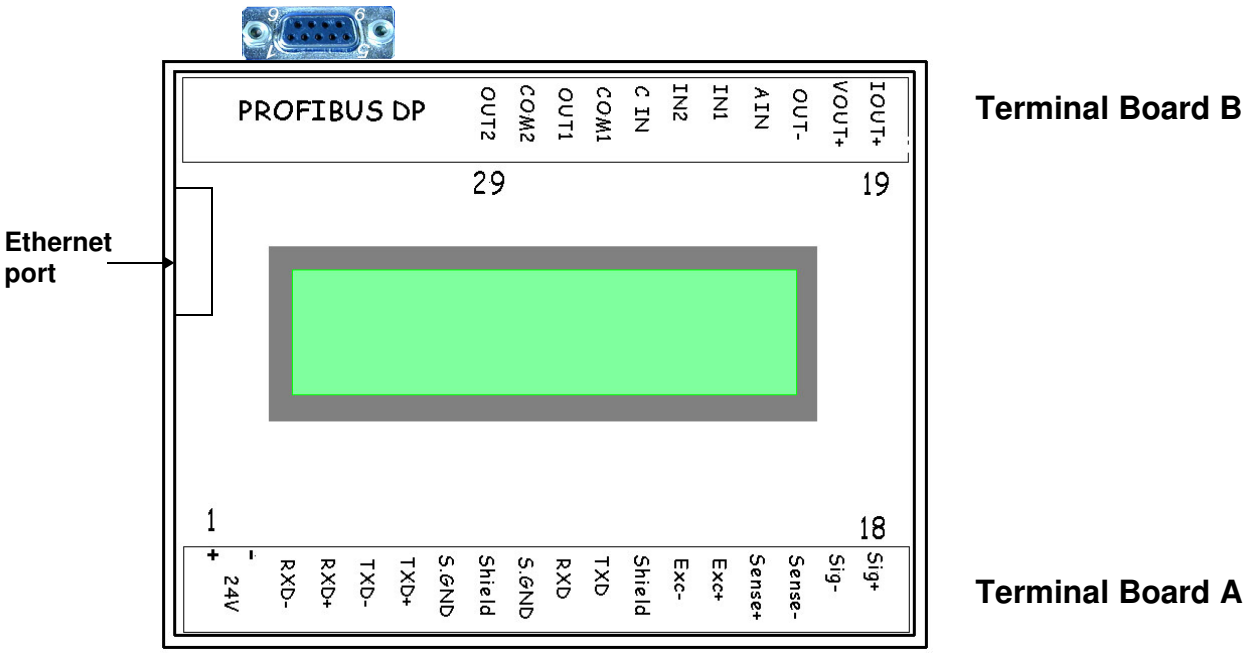
The UWT 600 optoisolated analog output can be configured as voltage or current:

0 to 5 Vdc or **0 to 10 Vdc** (Minimum load = 10 kΩ)
or **0 to 20 mA** or **4 to 20 mA** (Maximum load = 300 Ω)



Note:
Use a shielded cable and ground the shield at one side only.
The analog transmission is very sensitive to electromagnetic noise: run the cable separate from the others.

SUMMARY OF THE UWT 600 CONNECTIONS



NUM.	TERMINAL BOARD A	NUM.	TERMINAL BOARD B (options)
1	+24 Vdc Power supply	19	Analog output I (current) +
2	0Vdc Power supply	20	Analog output V (voltage) +
3	(RX-) RS422 / 485	21	Analog output -
4	(RX+) RS422 / 485	22	Analog input
5	(TX -) RS422 / 485	23	Digital input 1
6	(TX +) RS422 / 485	24	Digital input 2
7	GND	25	Digital inputs common
8	Serial shield	26	Relay output 1 (common)
9	GND	27	Relay output 1 (N.O. contact)
10	(RX) RS232	28	Relay output 2 (common)
11	(TX) RS232	29	Relay output 2 (N.O. contact)
12	Load cell shield		
13	Load cell Excitation -		
14	Load cell Excitation +		
15	Load cell Sense +		
16	Load cell Sense -		
17	Load cell Signal output -		
18	Load cell Signal output +		

2 pole terminal board

5 pole terminal board

4 pole terminal board

7 pole terminal board

3 pole terminal board

8 pole terminal board

HARDWARE TROUBLE SHOOTING

PROBLEM	CAUSE	REMEDY
The instrument does not switch on at power up	• No power supply • Terminal polarity is reversed	• Check the 24 Vdc connections • Check polarity at terminals 1+ and 2 -
The weight display remains unchanged while the scale is loaded or unloaded	• Bad load cell(s) or connections	• Check the load cell excitation (5 Vdc) at terminals 13 and 14 and the load cell output at terminals 17 and 18
The O-L message often comes up in the weight view	• The load cell gain may not be correct • The full scale calibration may be wrong	• Check the weight parameters, zero and full scale • Check the max net weight value
The inputs and outputs do not work correctly	• Connections errors or software configuration	• Check with the Test Sub Menu page 25 and review the specific configurations
The instrument does not accept the calibrations	• The available counts are not enough for the attempted calibration	• Redo the calibration: remember that the full scale number of counts must not exceed 600,000 (six hundred thousand)

NOTE. If you cannot solve your problem, call your nearest distributor or the manufacturer.

THE FRONT PANEL KEYS FUNCTIONS DURING THE SET-UP

ENTERING AND WORKING A MENU'

Press and hold to enter the set-up menu

Press to enter a sub-menu

Scroll down

Scroll up

Access the parameter, confirm and go to the next parameter


Exit the menu

NUMERICAL EDITING

Decrease value of blinking digit (-1)

Increase value of blinking digit (+1)


Move to the next digit

Accept value and exit

IN SELECTING A PARAMETER

Go to the next one

Go to the previous one

Accept and exit

THE FRONT PANEL KEYS FUNCTIONS IN THE OPERATING MODE

(Short press) Switches gross/net weight view (NET / GROSS)

(Long - 2 sec. - press) Activates (or de-activates) the Peak Mode

Access the setting of the Set-points #1 and #2. To edit their values follow the "Numerical Editing instructions" above

(Short press) Starts the serial output and sends the data string over the serial line

(Long - 2 sec. - press) Enters the set-up menu


This key performs the **zero in the gross weight** view. This happens only when the weight is stable or stabilizes within 2 sec. The highest value that can be zeroed (+ or -) is the "zero key range" parameter setting at page 21.
or
Tares the weight displayed when in **the net weight** view and **resets** the **peak** when in the peak mode. This happens only when the weight is stable or stabilizes within 2 sec.

The functions of the  key can also be performed by the digital input 1. See page 9 for wiring.

THE DISPLAY VIEWS

SOME WEIGHT VIEWS (These may appear in the operating mode to prompt the operator)

NET: _____ lb R1: 0 R2: 0 001	This view appears when the scale gross weight is 9 divisions below zero
NET: ^^^^^^^ lb R1: 0 R2: 0 001	This view appears when the scale gross weight is 9 divisions over the calibrated total capacity (LIVE WEIGHT parameter, page 19).
NET: O - L lb R1: 0 R2: 0 001	This view appears when the weight cannot be measured by the system.

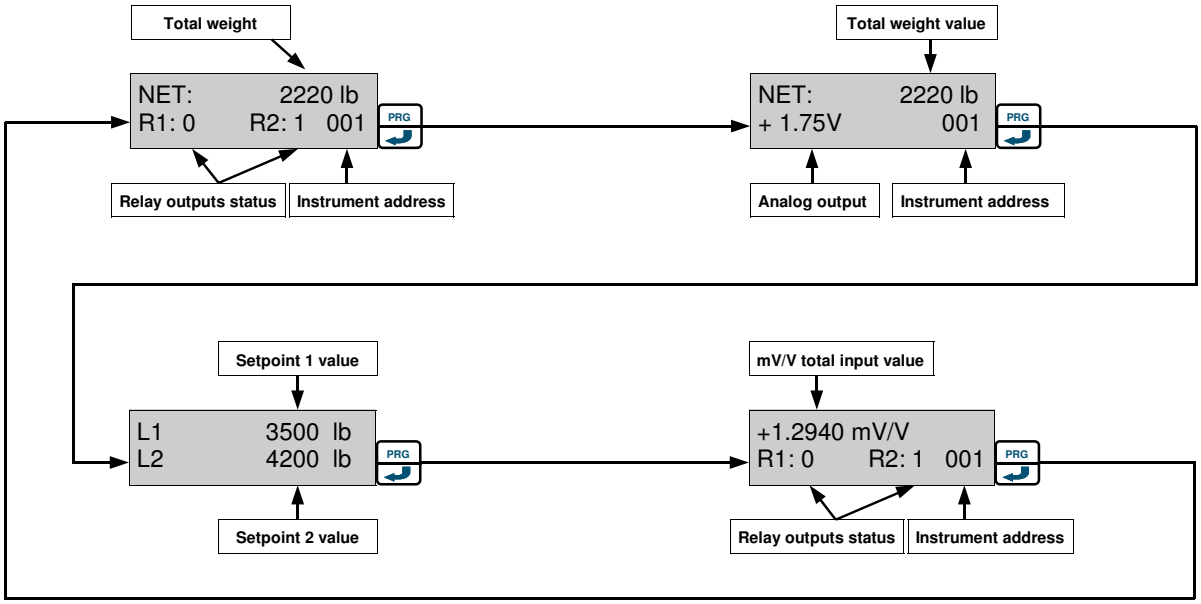
MORE VIEWS

POSSIBLE DISPLAY VIEWS DURING NORMAL OPERATION

The instrument allows the user to see additional information during normal operation.

This is possible only if the “MORE VIEWS” function has been enabled: see page 26.

Use the PRG key to switch among the display views that follow:

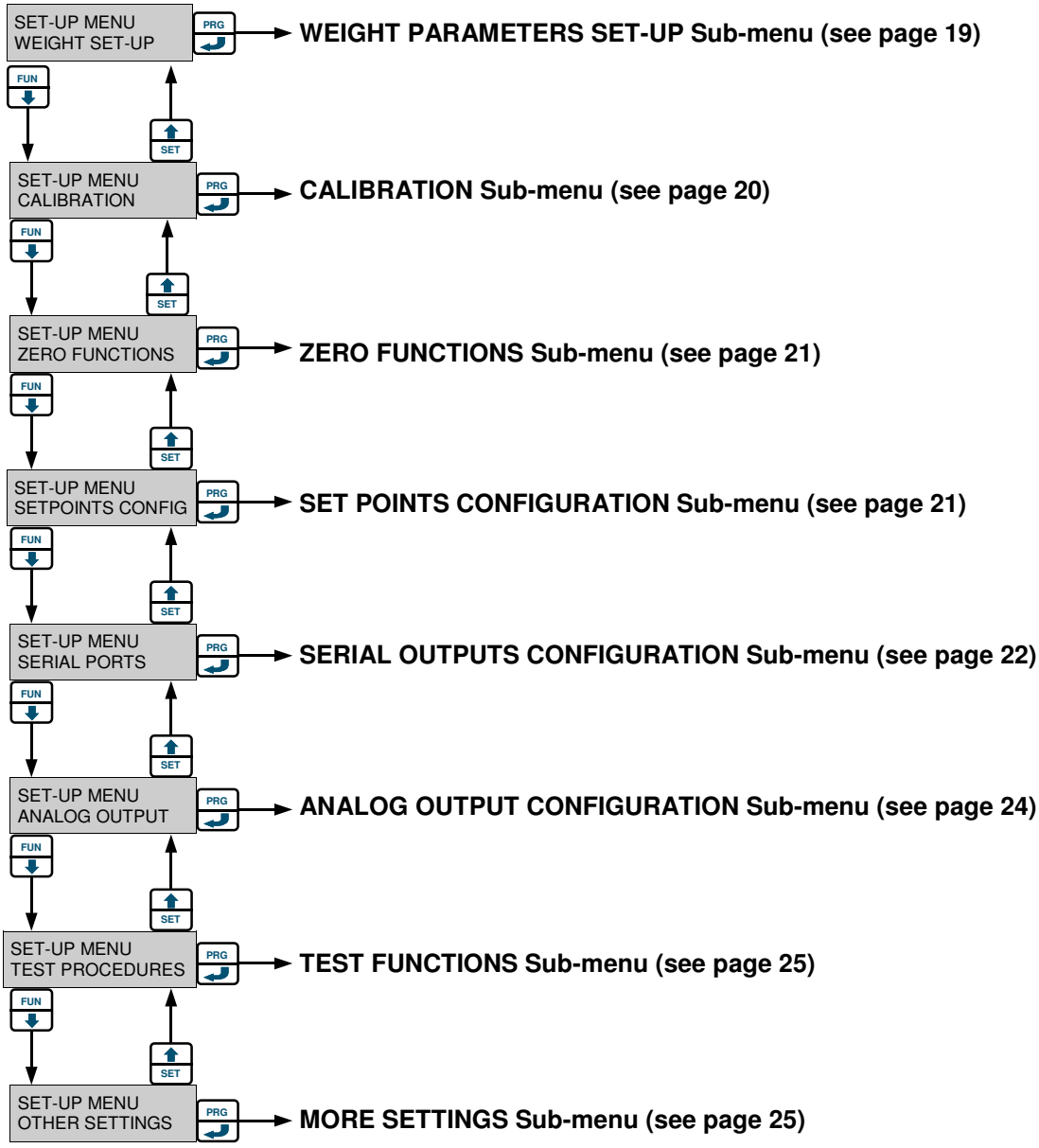


CONFIGURATION: THE MAIN SET-UP MENU

At power up, the instrument enters the operating mode and shows the weight.

Press and hold the PRG key to enter the first view of the Main Set-up Menu.

Use the FUN or SET key to scroll through the eight views and press the PRG key to enter any of the chosen sub-menus.

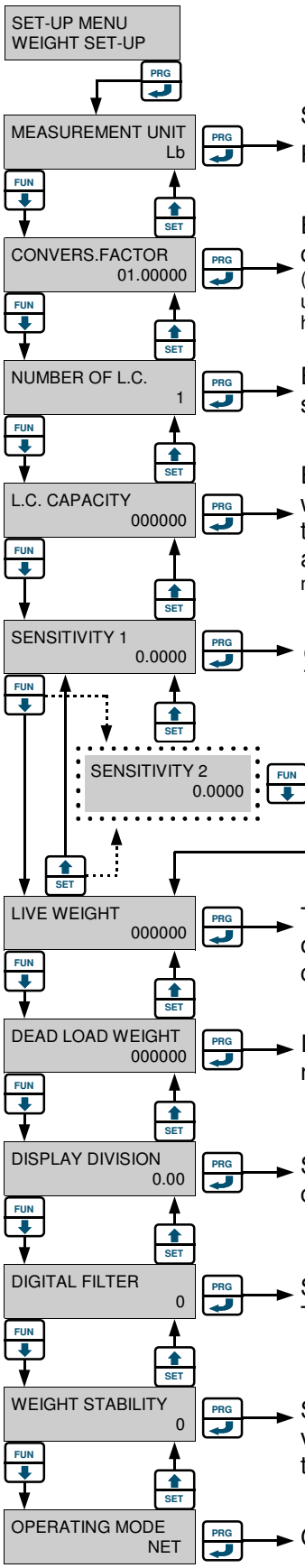


Press this key to exit and return to the operating mode (Press twice when in a sub-menu).
Before coming back to the operating mode the display will prompt the message “BACK-UP OPERATION” for a while.

WEIGHT PARAMETERS SET-UP SUB MENU

N.B. At delivery, some parameters are factory set to default values for quality and system test or customer instructions.

From the WEIGHT SET-UP view of the Main Menu (page 18) press the PRG key to enter the parameters set-up



THIS SET-UP ALSO PERFORMS THE DATA SHEET CALIBRATION

Select the engineering unit (kg, g, kN, N, lb, T, NONE) for the measurement value.

Press PRG to confirm and go to the next parameter (Do the same for every step ahead).

LC datasheet unit	Measurement unit (Display Reading)	Conversion factor
Lb	kg	2.20462
kg	Lb	0.45359
kg	N	0.10197
N	kg	9.80665
N	Lb	4.44822
kN	kg	0.00981
kN	Lb	0.00445

Enter the conversion factor for the datasheet mV calibration. Default is 1.
(This parameter defines the factor by which the load cell/s datasheet unit must be divided to be expressed in the 'measurement unit' that has been selected for the display reading).

Enter the number of the weighing system **active load cells** (1 through 4).

Enter the weighing system total capacity: this is the total weight supported by the LC's and the fixed support points expressed in the unit of the transducer datasheet (i.e. with four 1000N load cells enter 4000; with two load cells and two dummies enter 4000 as well). (The conversion factor 9.80665 will make the display to measure and read the weight in kg).

Enter the f.s. output signal (mV/V) of the load cells (2 through 4 as stamped on the load cell or on the calibration datasheets).
The number of these views conforms automatically to the number of LC entered above.

The instrument automatically proposes the live weight of the weighing system based on the number of the load cells and their capacities entered above. It can be manually corrected down to 10% of the total capacity of the load cells.

If known, enter the dead load of the system. The sum of the dead and live weight cannot exceed the total system capacity (LC capacity parameter).

Select the display division value from 0.001 to 100 or confirm the best value automatically displayed by the instrument software.

Select the value of the digital filter between 0 and 9.
The higher the filter the slower the reading update.

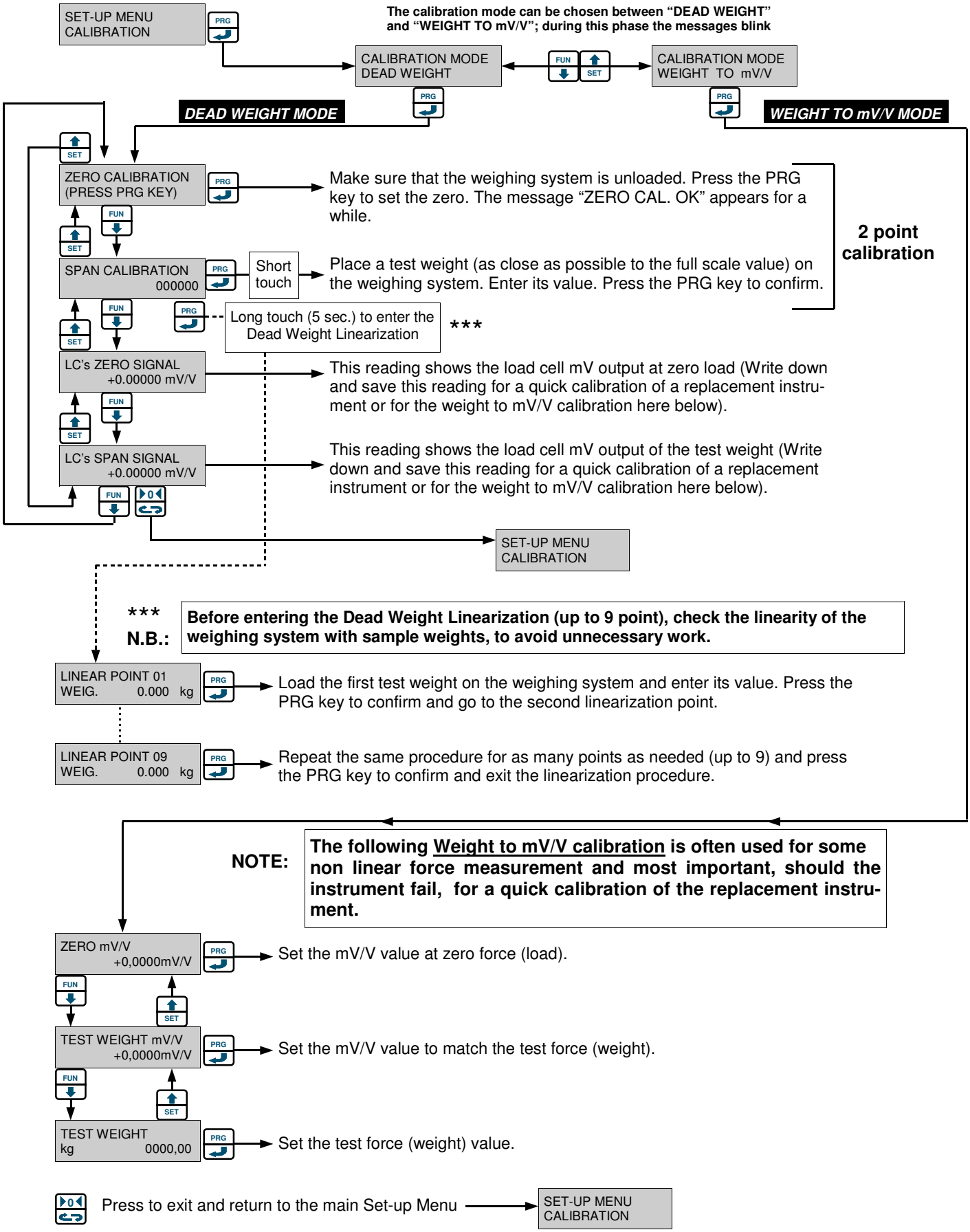
Select a stabilization value between 0 and 4. This is a time parameter. The lower the value the shorter the stabilization time allowed. By selecting 0, the instrument assumes that the weight is stable and will not slow down the weight display.

Choose between Net and Gross.

Press this key to exit and return to the main Set-up Menu. → SET-UP MENU WEIGHT SET-UP

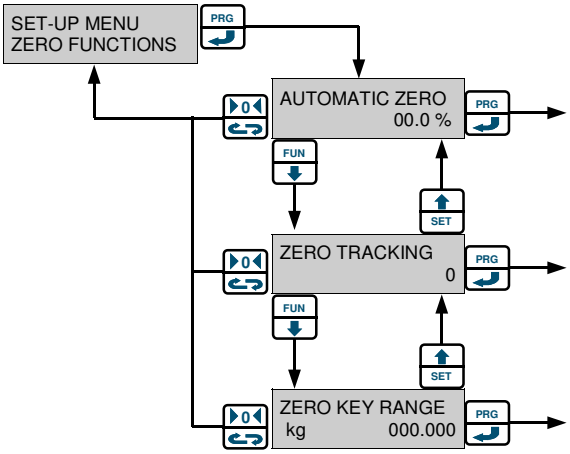
DEAD WEIGHT CALIBRATION, WEIGHT TO mV/V CALIBRATION AND LINEARIZATION SUB MENU

Only after setting the weight parameters of page 19, from the CALIBRATION view of the Main Menu (page 18) press the PRG key to access the Dead Weight, Weight to mV/V Calibration and linearization sub menu.



ZERO FUNCTIONS SUB MENU

From the ZERO FUNCTIONS view of the Main Menu (page 18) press the PRG key to enter the first view:



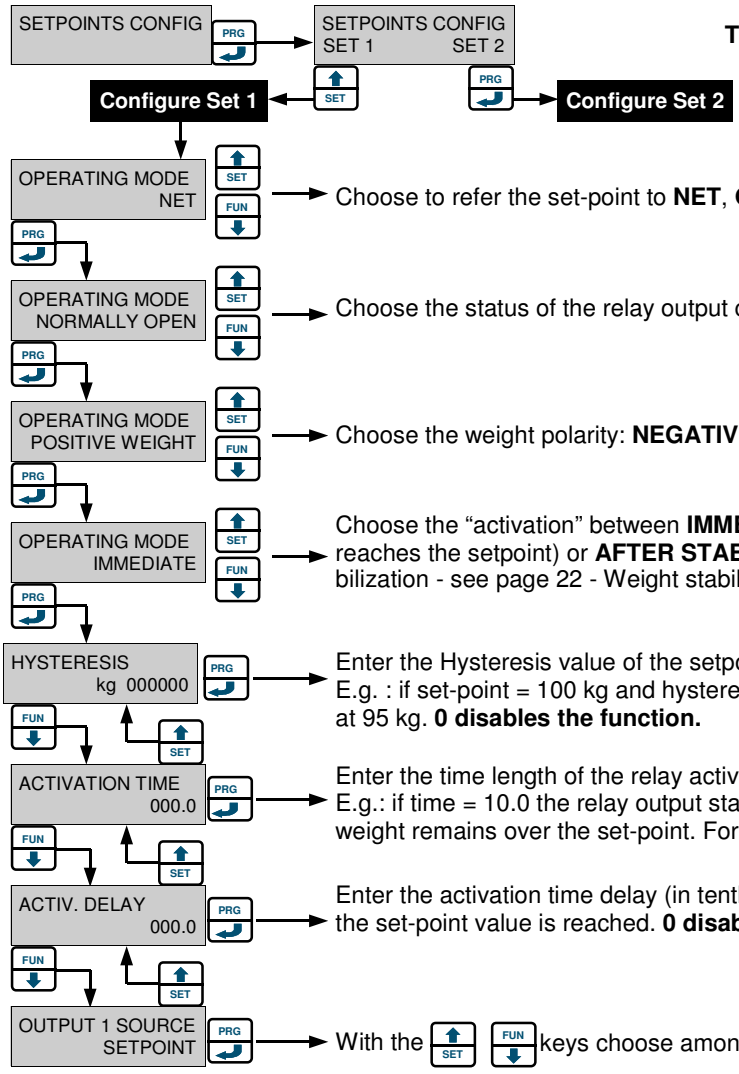
Enter the weight percentage value to be automatically zeroed at power up (up to 10% of the LIVE WEIGHT value - see page 19).

Enter the zero tracking speed (0 - 4). The zero tracking works with the value of the next parameter (ZERO KEY RANGE).
The 0 disables the function: the 1 tracks .5 divisions per second; the 2 = 1 div./sec. ; the 3 = 2 div./sec. ; the 4 = 3 div./sec.

Enter the weight value that can be zeroed with the key in GROSS mode (0 to LIVE WEIGHT - page 19).
The same function can be performed by activating the digital input #1 - page 9.

RELAY OUTPUTS CONFIGURATION SUB MENU

From the SETPOINTS CONFIG view of the Main Menu (page 18) press the PRG key to enter the first view:



The configuration menu is the same for both set-points.

Choose to refer the set-point to **NET**, **GROSS or PEAK.**

Choose the status of the relay output contact: **NORMALLY OPEN** or **NORMALLY CLOSED**.

Choose the weight polarity: **NEGATIVE** or **POSITIVE**.

Choose the "activation" between **IMMEDIATE** (the relay output activates as soon as the weight reaches the setpoint) or **AFTER STABILITY** (the relay output activates only after the weight stabilization - see page 22 - Weight stability parameter).

Enter the Hysteresis value of the setpoint (range 1 to Setpoint value).
E.g. : if set-point = 100 kg and hysteresis = 5 the relay output activates at 100 and de-activates at 95 kg. **0 disables the function.**

Enter the time length of the relay activation (in tenths of second, 0.1 to 100.0).
E.g.: if time = 10.0 the relay output stays active for 10 seconds, then de-activates even if the weight remains over the set-point. For continuous activation enter 0.

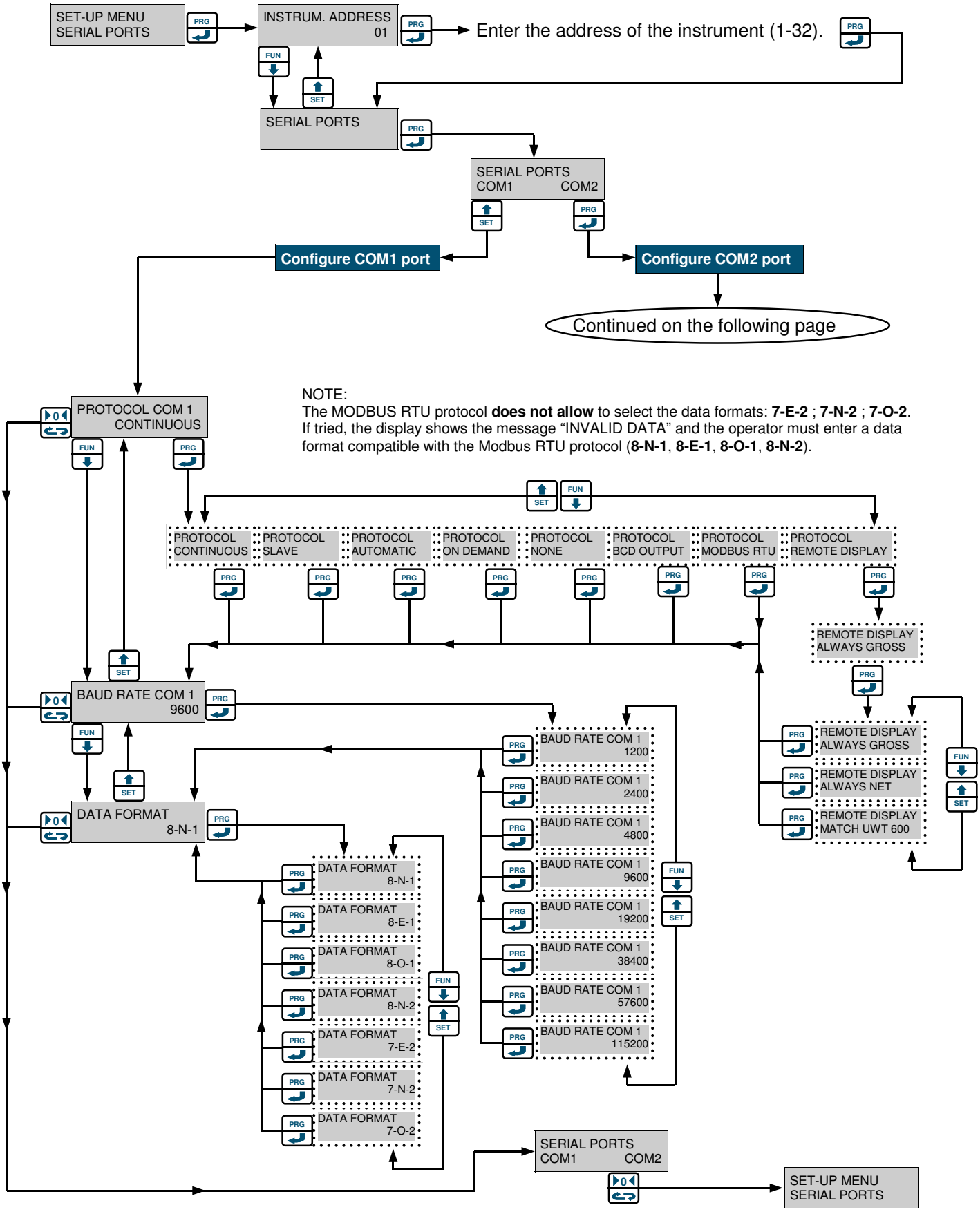
Enter the activation time delay (in tenths of second, 0.1 to 100.0). The delay starts as soon as the set-point value is reached. **0 disables the function.**

With the SET FUN keys choose among **Setpoint, mV or Process.**

Choosing the Setpoint view the output works according to the Setpoint value entered.
Choosing the mV view the output works according to error conditions such as underload, overload, offrange, load cell disconnected; in this case, when an error condition occurs the contact of the relay output closes.
Choosing Process the output works according to the same error conditions, but, in this case the contact of the relay output opens.

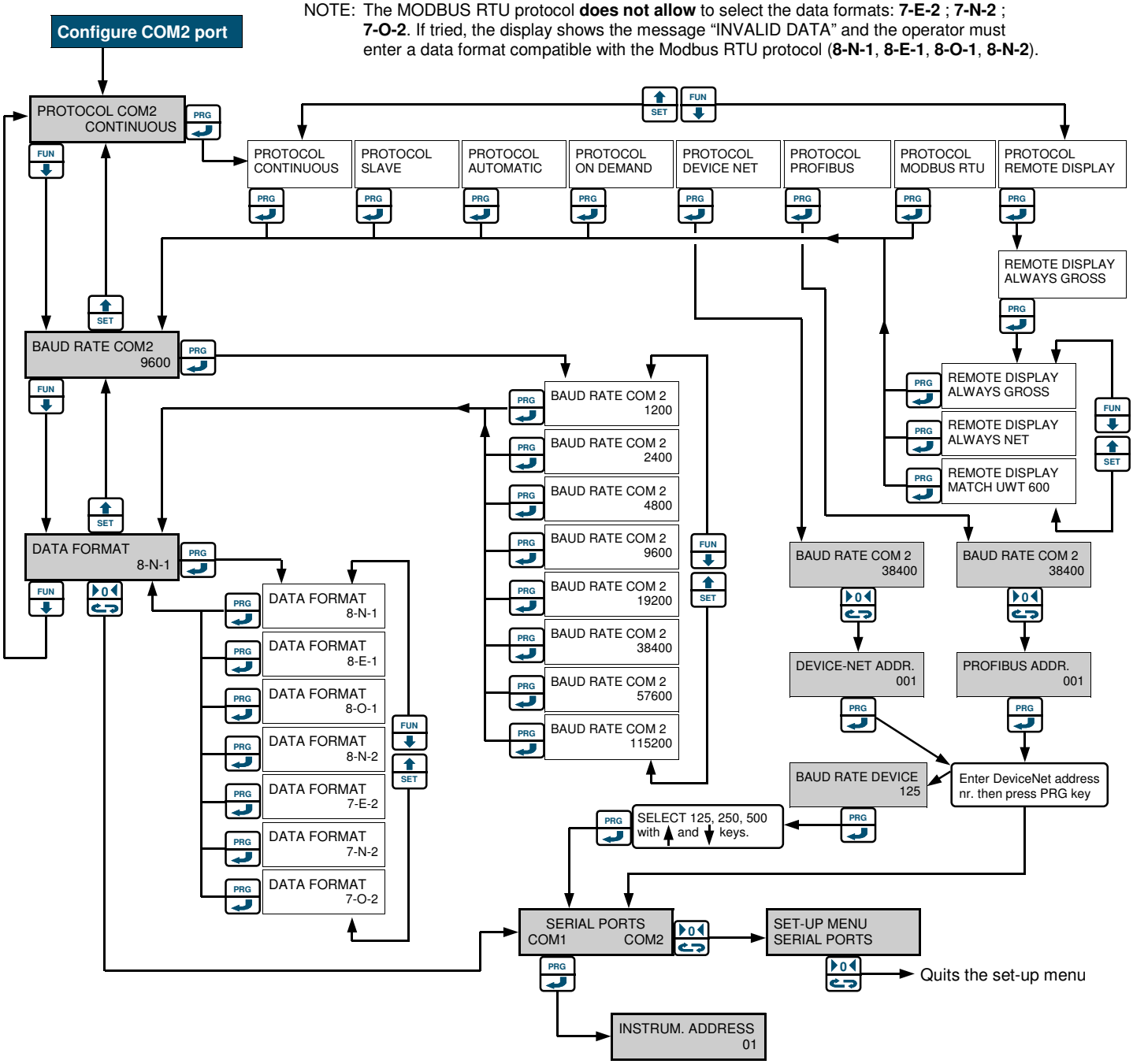
UWT 600 SERIAL PORTS CONFIGURATION SUB MENU

From the SERIAL PORTS view of the Main Menu (page 18) press the PRG key to enter the first view:



Continued from the previous page

NOTE: The MODBUS RTU protocol **does not allow** to select the data formats: **7-E-2** ; **7-N-2** ; **7-O-2**. If tried, the display shows the message “INVALID DATA” and the operator must enter a data format compatible with the Modbus RTU protocol (**8-N-1**, **8-E-1**, **8-O-1**, **8-N-2**).



CONTINUOUS
The instrument sends out the weight string continuously.

SLAVE
The instrument answers with a weight string when receives a request string from a Master unit. Often the Slave protocol is used in a RS485 network. The response time may vary from 1 to 20 milliseconds unless the delay parameter is set. See page 38.

AUTOMATIC
The weight string is transmitted automatically when the weight stabilizes at any value over the minimum weight level (20 divisions). A second transmission will be performed only if the weight has changed in the meantime by at least 20 divisions. See page. 37.

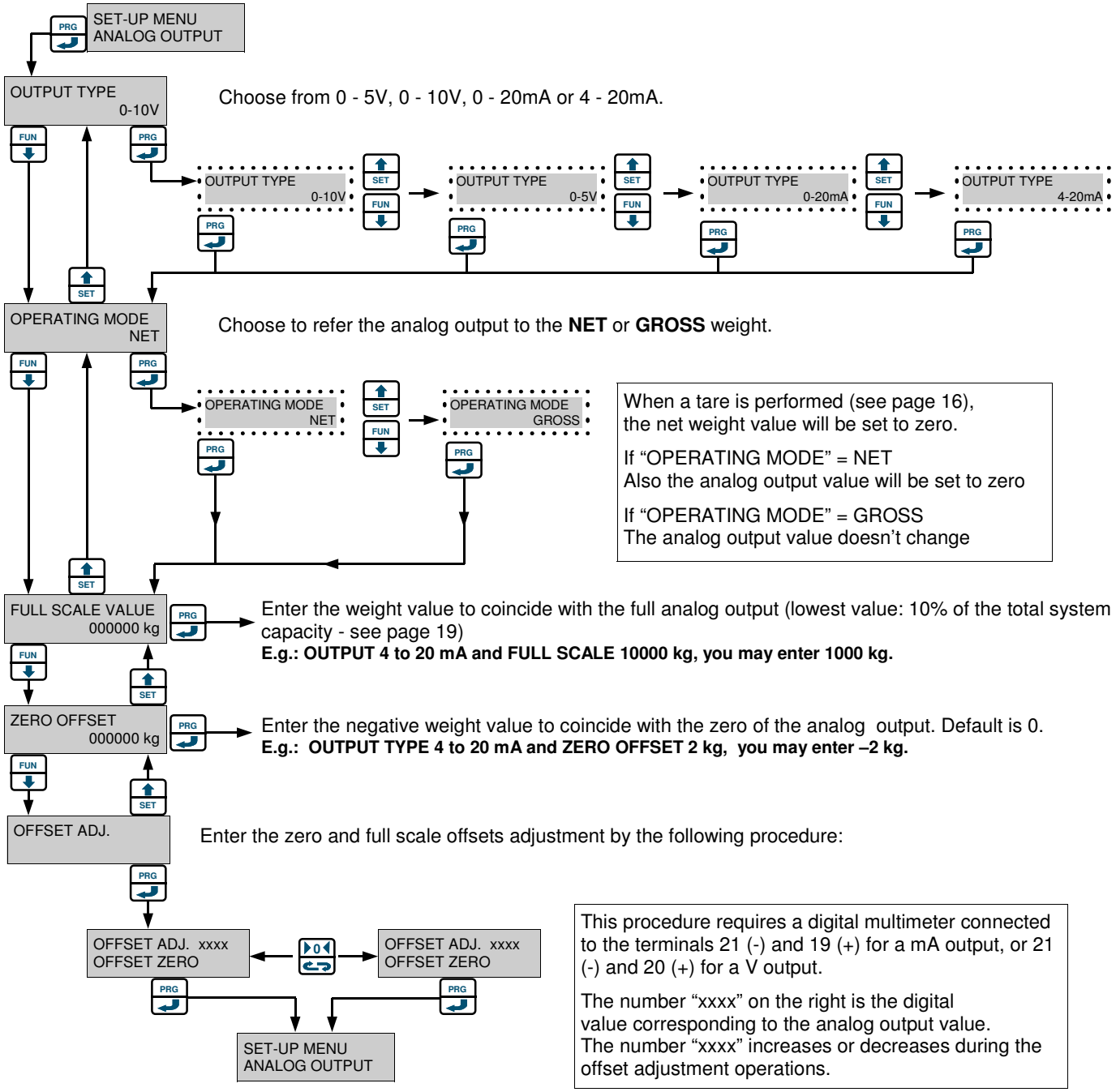
ON DEMAND (MANUAL)
The weight string is transmitted at the operator demand either by pressing the PRG key or by activating the logic input # 2. The command is not accepted if the weight is not stable. A second command will not be accepted by the instrument unless the weight has changed in the meantime by at least 20 divisions. See page. 37.

PROFIBUS - DEVICENET
Profibus-DP or DeviceNet protocols. See page 40.

MODBUS RTU
Modbus RTU standard protocol. See page 27.

ANALOG OUTPUT CONFIGURATION SUB MENU

From the ANALOG OUTPUT view of the Main Menu (page 18) press the PRG key to enter the first view:



Use of the keys for the adjustment of the zero and f.s. offsets:

(Short touch) = fine adjustment of the offset **increment**.

(Long touch) = coarse adjustment of the offset **increment**.

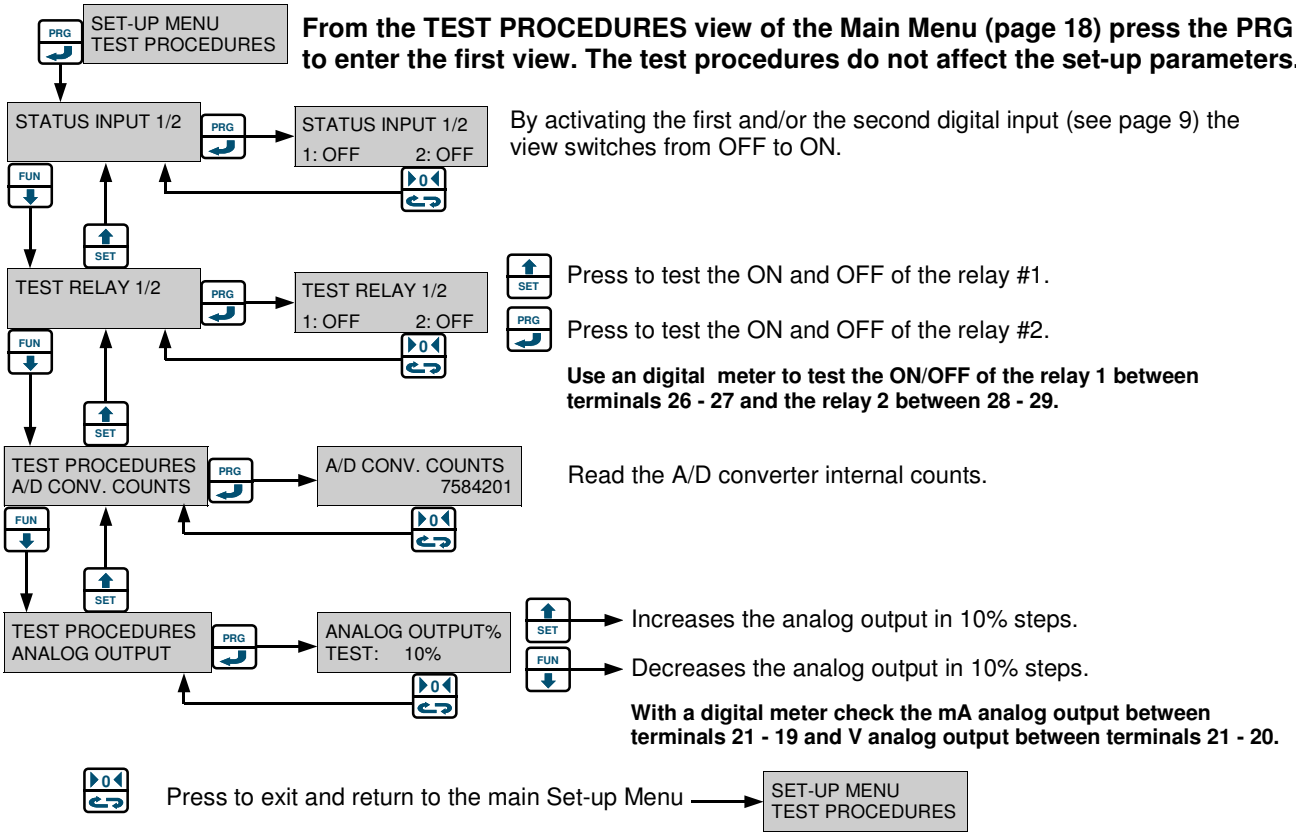
(Short touch) = fine adjustment of the offset **decrement**.

(Long touch) = coarse adjustment of the offset **decrement**.

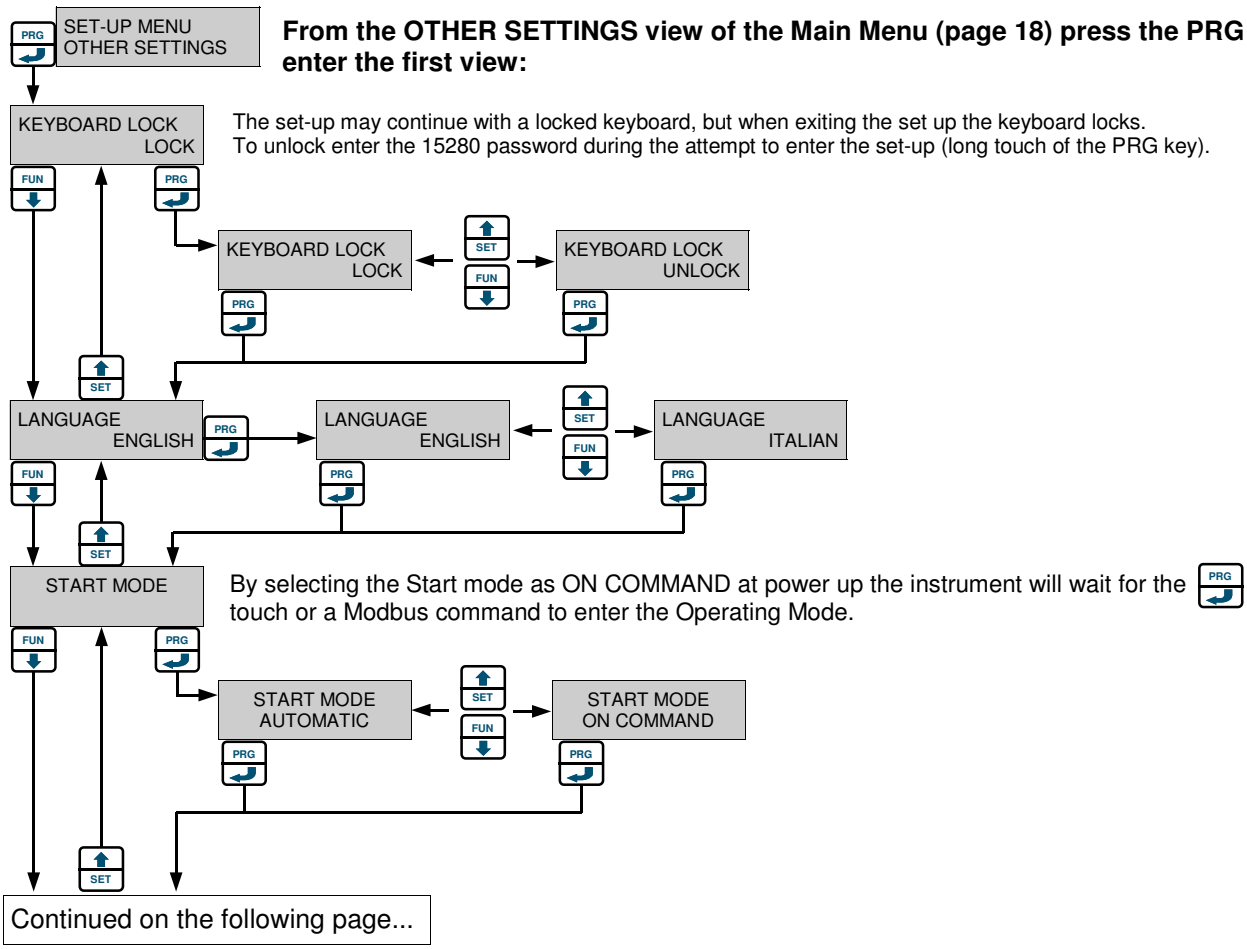
Choose the offset to adjust: zero ◄► full scale (switch).

Confirm, save data and return to the main Set-up Menu. → SET-UP MENU ANALOG OUTPUT

TEST PROCEDURES SUB MENU



OTHER SETTINGS SUB MENU



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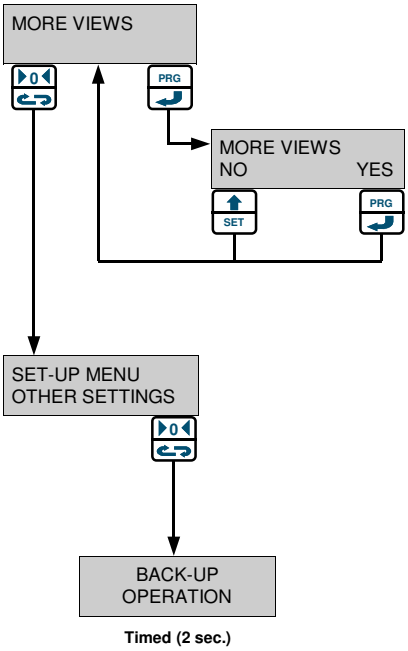


Enables or disables the “MORE VIEWS” function that allows to see additional information when the instrument is in the operating mode. See page 17.

MODBUS RTU PROTOCOL SPECIFICATIONS

PRECAUTIONS

The Modbus protocol writes directly into the memory of the instrument.

Use caution when sending data to the instrument:

- The data being sent must be within the specified ranges given in the tables on the following pages. The data being sent have to allow the instrument to work properly.
- Some of the data is written into the E2prom's memory (refer to the column in the tables "**Stored in E2prom**" for additional information). This memory can only be **written to 100,000 times**, therefore, you should avoid writing continuously into this memory.
- To confirm the storage of a new value in the E2prom, perform the MAKE - BACKUP function. If this function is not performed, all of the newly stored data will be lost when power is removed from the instrument.
- In case of several data to be stored, perform the MAKE - BACKUP function once alle the data have been set.
- The "Set point" setting does not require the MAKE - BACKUP function to be performed.
- **All the weight values are given as absolute values**

Note:
The numeric values on the following pages for (addresses, codes, and data) are represented as decimal values.

The addresses given in the following tables refer to the standards provided in the Modicon Modbus Protocol Reference Guide PI-MBUS-300 Rev J.

For any other clarification visit the web site www.modbus.org

DATA FORMAT

- Start Bit : 1
- Data Bits : 8, the Least Significant Bit (LSB) is sent first.
- Parity : No, Even, Odd
- Stop Bits : 1, 2

Possible Data Format Selection: **8 - N - 2 8 - E - 1 8 - O - 1**

LIST OF SUPPORTED FUNCTIONS

Function	Description
03 (03)*	READ HOLDING REGISTERS (Programmable registers reading)
16 (10)*	PRESET MULTIPLE REGISTERS (Multiple registers writing)

* Hexadecimal values between brackets

Each function is explained on the following pages.

Each function is composed by a **Query** (request master ⟶ instrument) and a **Response** (answer instrument ⟶ master). **Queries** and **Responses** are composed by a sequence of data that are briefly explained at the page bottom (***).

The "0x" code before any value indicates an hexadecimal value.

All the Modbus addresses have to be represented as **hexadecimal values; moreover, an important rule must be respected:**

Before converting a 5 digit Modbus address into an hexadecimal value, the 1st digit has to be deleted and the remaining 4 digits have to be decremented by "1".

1st Example:

To represent the address **40132** ("display division") as hexadecimal value, delete the "**4**" ("**0132**" remains), then subtract 1 from "**0132**". The result is "**0131**": now perform the conversion into hexadecimal. The result is "**00 83**". This is the value to be used in the query that the Master will send to the instrument to identify the address **40132.**

2nd Example:

To represent the address **40403** ("analog output range") as hexadecimal value, delete the "**4**" ("**0403**" remains), then subtract 1 from "**0403**". The result is "**0402**": now perform the conversion into hexadecimal. The result is "**01 92**". This is the value to be used in the query that the Master will send to the instrument to identify the address **40403.**

(***)

Address:	instrument's address, represented as hexadecimal value (in this case do not decrement by 1 the number).
Function:	number of the function to be performed (see the table above)
1st register address:	number of the 1st register address to be read or written (start point)
Number of registers:	number of the registers to be read or written
Register value:	value to be written in a register
Number of bytes:	total amount of bytes to be written (each address is made off 2 bytes)
2 byte CRC:	"Cyclical Redundancy Check". It's an algorithm used as checksum.

LIST OF TRANSMISSION STRINGS

Symbols used in the strings
A = 1 byte used to identify the slave address (Example: Slave Nº 17: **A = 0x11**)

FUNCTION 3: READ HOLDING REGISTERS (Programmable registers reading)

QUERY

Address	Function	1st Register address	Number of registers	2 byte
A	0x03	0x0000	0x0002	CRC

RESPONSE

Address	Function	Number of bytes	1st Register value	2nd Register value	2 byte
A	0x03	0x04	0x0064	0x00C8	CRC

FUNCTION 16: PRESET MULTIPLE REGISTERS (Multiple registers writing)

QUERY

Address	Function	1st Register address	Number of registers	Number of bytes	1st Register value	2nd Register value	2 byte
A	0x10	0x0000	0x0002	0x04	0x0000	0x0000	CRC

RESPONSE

Address	Function	1st Register address	Number of registers	2 byte
A	0x10	0x0000	0x0002	CRC

BROADCAST MODE

This function is not implemented in the instrument

COMMUNICATION ERRORS

The communication strings are controlled by the CRC (Cyclical Redundancy Check). If a communication error occurs, the slave unit doesn't answer. The master unit controls a timeout when waiting for the response from the slave. If the slave doesn't answer during this timeout, it means that a communication error has occurred.

ERRORS IN THE RECEIVED DATA

If the string is received correctly but is not executable, the slave answers the master with an EXCEPTION RESPONSE.
The field "function" is transmitted having the most significant digit (MSD) set to 1.

EXCEPTION RESPONSE

Address	Function	Exception code	2 byte
A	Function + 80h	0 x 01	CRC

Description of the Exception codes.

Code	Description
1	ILLEGAL FUNCTION (The function is not valid or not supported)
2	ILLEGAL DATA ADDRESS (The specified data address is not available)
3	ILLEGAL DATA VALUE (The data value received is not valid)

See the tables on the two following pages

Modbus address	Description	Read/Write Functions	Range Value (bounds included)	Note	Stored in E2prom
	Setpoints temporary				
40001 40002	Setpoint 1 temporary (MSB) Setpoint 1 temporary (LSB)	R/W	0 to Full scale		NO
40003 40004	Setpoint 2 temporary (MSB) Setpoint 2 temporary (LSB)	R/W	0 to Full scale		NO
	Command register				
40005	Command register	W	1 - 4, 5, 9, 16 - 19, 32		See relative table
	Setpoints permanent				
40006 40007	Setpoint 1 permanent (MSB) Setpoint 1 permanent (LSB)	R/W	0 to Full scale		YES
40008 40009	Setpoint 2 permanent (MSB) Setpoint 2 permanent (LSB)	R/W	0 to Full scale		YES
	Weight values				
40010 40011	Gross weight value (MSB) Gross weight value (LSB)	R			NO
40012	Input status byte	R			NO
40013 40014	Net weight value (MSB) Net weight value (LSB)	R			NO
40015	Number of decimal digits	R	0 - 3		
40016 40017	Conversion factor (MSB) Conversion factor (LSB)	R/W	0.00100 - 99.00000	(7)	YES
	Peak reading				
40020 40021	Peak value (MSB) Peak value (LSB)	R	1 to Full scale		NO
	Command data register and Status register				
40080	Command data register	W			
40081	Status register	W	3 - 6		See relative table
40082	Status data register	W			
	Basic configuration				
40100 40101	Load cell/s total capacity (MSB) Load cell/s total capacity (LSB)	R/W	1 - 999999	(1)	YES
40109	Load cell 1 Sensitivity	R/W	1.0000 - 4.0000	(7)	YES
40110	Load cell 2 Sensitivity	R/W	1.0000 - 4.0000	(7)	YES
40111	Load cell 3 Sensitivity	R/W	1.0000 - 4.0000	(7)	YES
40112	Load cell 4 Sensitivity	R/W	1.0000 - 4.0000	(7)	YES
40113 40114	Live weight value (MSB) Live weight value (LSB)	R/W	1 to Full scale	(2)	YES
40115 40116	Dead load value (MSB) Dead load value (LSB)	R/W	0 to Full scale	(2)	YES
40117 40118	A/D converter internal counts (MSB) A/D converter internal counts (LSB)	R			NO
40119 40120	Sample weight for “weight to mV” calibration (MSB) Sample weight for “weight to mV” calibration (LSB)	R/W	1 to Full scale		YES
40121 40122	mV/V value relevant to zero calibration (MSB) mV/V value relevant to zero calibration (LSB)	R/W	-0.5 / + 3.5	(7)	YES
40123	Polarity of the mV/V value (relevant to zero)	R/W	0 = “+” 1= “-”		YES
32767 32768	mV/V value relevant to f.s. calibration (MSB) mV/V value relevant to f.s. calibration (LSB)	R/W	-0.5 / + 3.5	(7)	YES
40126	Polarity of the mV/V value (relevant to f.s.)	R/W	0 = “+” 1= “-”		YES
40127 40128	mV/V value coming from the load cell/s (MSB) mV/V value coming from the load cell/s (LSB)	R	-0.5 / + 3.5	(7)	NO
40129	Polarity of the mV/V value coming from the load cell/s	R	0 = “+” 1= “-”		NO
40130	Number of load cells connected	R/W	1 - 4		YES
40131	Instrument operating mode	R/W	0 – 2	(4)	YES
40132	Display division value	R/W	0 – 18	(3)	YES
40133	Measurement unit	R/W	0 – 5	(4)	YES

Modbus address	Description	Read/Write Functions	Range Value (bounds included)	Note	Stored in E2prom
	Weighing parameters				
40180	Digital filter value	R/W	0 - 9		YES
40181	Weight stability value	R/W	0 - 4		YES
40182	Automatic zero range at power on	R/W	0.1 - 10.0 (percentage)	(7)	YES
40183	Zero traking value	R/W	0 - 4		YES
40184 40185	"Zero" key operating range (MSB) "Zero" key operating range (LSB)	R/W	0 to Full scale		YES
	Setpoints configuration				
40200	Relay output 1 source	R/W	0 - 2	(4)	YES
40201	Setpoint 1 operating mode	R/W		(8)	YES
40202 40203	Setpoint 1 hysteresis value (MSB) Setpoint 1 hysteresis value (LSB)	R/W	0 to Full scale		YES
40204	Setpoint 1 activation time length	R/W	0.0 - 100.0	(7)	YES
40205	Setpoint 1 activation delay	R/W	0.0 - 100.0	(7)	YES
40206	Relay output 2 source	R/W	0 - 2	(4)	YES
40207	Setpoint 2 operating mode	R/W		(8)	YES
40208 40209	Setpoint 2 hysteresis value (MSB) Setpoint 2 hysteresis value (LSB)	R/W	0 to Full scale		YES
40210	Setpoint 2 activation time length	R/W	0.0 - 100.0	(7)	YES
40211	Setpoint 2 activation delay	R/W	0.0 - 100.0	(7)	YES
	Serial configuration				
40300	Instrument's serial address	R/W	1 - 32		YES
40301	COM1 baud rate	R/W	0 - 7	(4)	YES
40302	COM1 protocol type	R/W	0 - 6	(4)	YES
40303	COM1 data format	R/W	0 - 6	(4)	YES
40304	Profibus or DeviceNet address	R/W	0-126 (Profi) ; 0-63 (DevNet)		YES
40305	COM2 baud rate	R/W	0 - 7	(4)	YES
40306	COM2 protocol type	R/W	0 - 2	(4)	YES
40307	COM2 data format	R/W	0 - 6	(4)	YES
	Analog output configuration				
40400 40401	Analog output full scale (MSB) Analog output full scale (LSB)	R/W	1 to Full scale		YES
40402	Analog output operating mode	R/W	0-1	(4)	YES
40403	Analog output range type	R/W	0-3	(4)	YES
40404	Zero offset adjustment	R/W		(5)	
40405	Full scale offset adjustment	R/W		(5)	
40406 40407	Negative weight value for zero analog output (MSB) Negative weight value for zero analog output (LSB)	R/W	0 to Full scale		YES
	Other settings				
40500	Language	R/W	0 - 1	(4)	YES
40501	Start mode	R/W	0 - 1	(4)	YES
40502	Keyboard lock	R/W	0 - 1	(4)	YES
40503	More views	R/W	0 - 1	(4)	YES
40504	Instrument software version	R			
40600	Boot Loader function	W		(6)	NO

Notes:

(1) Total capacity $\geq$ Live weight + Dead load
(2) Live weight + Dead load $\leq$ Total capacity. The Live weight value cannot be less than 10% of the L.C. total capacity.
(3) Refer to the 19 values from 0.001 to 100 (see table "DISPLAY DIVISION VALUE" on page 34
(4) Refer to the tables on pages 34 and 35
(5) They are stored in the E2prom if writing the function 0000 in the status register.
(6) Enter the value 0x424C in the address 40600 to enable the "boot loader" function (this function is not yet available).
(7) When setting these values the decimal point has not to be included.
(8) Refer to the table on page 36

TABLE OF THE "INPUT STATUS BYTE"

Description	Bit's meaning		
	0	1	
Net weight polarity	+	-	1
Gross weight polarity	+	-	0
Weight stability	NO	YES	1
Millivolt polarity	+	-	0
Underload condition	NO	YES	0
Overload condition	NO	YES	0
Offrange condition	NO	YES	0
Preset tare condition	NO	YES	1
Input 1	De-activated	Activated	0
Input 2	De-activated	Activated	0

The Modbus address 40012 is composed by 2 bytes.
The conversion of these 2 bytes from hexadecimal into binary gives the meaning of each single bit described in this table.

E.g.
if the bytes in the address 40012 are **00 85**, the conversion into binary gives the sequence of bits **10000101**.
The digit at the right hand side matches with the 1st bit (Net weight polarity), therefore the values given in the above mentioned example are equivalent to:

Net weight polarity = 1 = negative
Gross weight polarity = 0 = positive
Weight stability = 1 = yes
Millivolt polarity = 0 = positive
Underload, Overload, Off range condition = 0, 0, 0 = no
Preset tare condition = 1 = yes
Input 1 = 0 = De-activated
Input 2 = 0 = De-activated

LIST OF THE FUNCTIONS "COMMAND REGISTER"

Function codes	Description	Modbus address in which the function code must be written	Modbus address in which the value must be written	Stored in E2prom
0001 (01)	Semi-automatic zero	40005	-	NO
0002 (02)	Autotare	40005	-	NO
0003 (03)	Peak value reset	40005	-	NO
0004 (04)	Switch to Net weight visualization	40005	-	NO
0005 (05)	Switch to Gross weight visualization	40005	-	NO
0009 (09)	Start command (after power on)	40005	-	NO
0016 (10)	Zero calibration	40005	-	YES
0017 (11)	Full scale calibration	40005	Write the Sample weight value in the address 40080	YES
0018 (12)	Erase zero calibration	40005	-	YES
0019 (13)	Erase full scale calibration	40005	-	YES
0032 (20)	Make back-up eeprom	40005	-	YES

Hexadecimal values between brackets

LIST OF THE FUNCTIONS "STATUS REGISTER"

Function codes	Description	Modbus address in which the function code must be written	Modbus address in which the value must be written	Stored in E2prom
0000 (00)	None of the functions are activated	40081	-	NO
0003 (03)	Analog output zero offset adjustment	40081	40404	NO
0004 (04)	Analog output full scale offset adjustment	40081	40405	NO
0005 (05)	Test input / output	40081	-	NO
0006 (06)	Test analog output	40081	Write the Analog output value in the address 40082 (0 - 64000)*	NO

Hexadecimal values between brackets

* Value 0 = 0% - Value 64000 = 100% Value 6400 = 10%, Value 12800 = 20%, Value 19200 = 30%, etc….

RELATION BETWEEN THE PARAMETERS AND THE MODBUS CODES

Display division value	Dec.	Hex.
0,001	0	00
0,002	1	01
0,005	2	02
0,010	3	03
0,020	4	04
0,050	5	05
0,01	6	06
0,02	7	07
0,05	8	08
0,1	9	09
0,2	10	0A
0,5	11	0B
1	12	0C
2	13	0D
5	14	0E
10	15	0F
20	16	10
50	17	11
100	18	12

Measurement unit	Dec.	Hex.
None	0	00
g	1	01
kg	2	02
T	3	03
lb	4	04
N	5	05
kN	6	06

Instrument's Operating mode	Dec.	Hex.
NET	0	00
GROSS	1	01
PEAK	2	02

Relay output 1-2 source	Dec.	Hex.
SETPOINT	0	00
PROCESS	1	01
mV	2	02

Analog output Operating mode	Dec.	Hex.
NET	0	00
GROSS	1	01

Analog output Range type	Dec.	Hex.
0 - 10 V	0	00
0 - 5 V	1	01
4 - 20 mA	2	02
0 - 20 mA	3	03

Language	Dec.	Hex.
ITALIAN	0	00
ENGLISH	1	01

Start mode	Dec.	Hex.
AUTOMATIC	0	00
COMMAND	1	01

Keyboard lock	Dec.	Hex.
UNLOCKED	0	00
LOCKED	1	01

More Views	Dec.	Hex.
NO	0	00
YES	1	01

RELATION BETWEEN THE PARAMETERS AND THE MODBUS CODES

COM1 Protocols	Dec.	Hex.
ON DEMAND	0	00
AUTOMATIC	1	01
SLAVE	2	02
CONTINUOUS	3	03
REMOTE DISPLAY	4	04
MODBUS RTU	5	05
BCD OUTPUT	6	06
NONE	7	07

COM2 Protocols	Dec.	Hex.
ON DEMAND	0	00
AUTOMATIC	1	01
SLAVE	2	02
CONTINUOUS	3	03
REMOTE DISPLAY	4	04
MODBUS RTU	5	05
PROFIBUS	6	06
DEVICENET	7	07

COM1 - COM2 Baud rate	Dec.	Hex.
1200	0	00
2400	1	01
4800	2	02
9600	3	03
19200	4	04
38400	5	05
57600	6	06
115200	7	07

COM1 - COM2 Data format	Dec.	Hex.
7 - E - 2	0	00
7 - N - 2	1	01
7 - O - 2	2	02
8 - N - 1	3	03
8 - E - 1	4	04
8 - O - 1	5	05
8 - N - 2	6	06

REMARKS ON THE USE OF THE SERIAL PORTS RS232 and RS422/485

Serial ports (nr. 2)	COM1: Rs232c half duplex COM2: Rs422/Rs485 half duplex.
Max. cable length	15m - 50 feet (Rs232c) / 1000m - 3300 feet (Rs422 and Rs485)
Serial protocols	ASCII, MODBUS RTU
Baud rate	1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200 selectable
Optional protocol	PROFIBUS DP (takes the place of Rs422/Rs485)
Optional protocol	DEVICENET (takes the place of Rs422/Rs485)
Optional protocol	Ethernet (takes the place of Rs422/Rs485)

When using the serial ports please consider the following:

- When the instrument is equipped with the Profibus-DP, DeviceNet or Ethernet option the serial port RS422/RS485 is not available . In this case the only port available is the RS232 and, if the connection cable exceeds 15 m (50 feet), the RS232/485 serial converter (SC 600 option) must be used (see page 12 for wiring).

HEX CODES FOR SETPOINTS 1-2 OPERATING MODE

The table here below represents the Hex Codes corresponding to all the possible operating mode of the 2 set-points.
The Hex Codes are available both in the Modbus RTU and in the Profibus-DP or DeviceNet protocols.

1. In the Modbus RTU protocol the Hex Codes are contained in the addresses 40201 and 40207 (see the Table “List of the holding registers” - page 32).
2. In the Profibus-DP or DeviceNet protocols the Hex Codes are contained in the bytes 6 - 7 of the “Output Data Area” and in the Register nr. 4 of the Page 4 (see “List of Pages” - page 44).

The following table provides for all the possible combinations.

The data are contained in the Least Significant Byte (LSB)

Setting or reading a certain Set-point Operating Mode takes place by writing or reading the relevant Hex Code.

	Operating mode Set-point 1 and 2			Operating mode Set-point 1 and 2		
	NET	GROSS	PEAK	NET	GROSS	PEAK
	N.O.	N.O.	N.O.	N.C.	N.C.	N.C.
	POSITIVE	POSITIVE	POSITIVE	POSITIVE	POSITIVE	POSITIVE
	IMMEDIATE	IMMEDIATE	IMMEDIATE	IMMEDIATE	IMMEDIATE	IMMEDIATE
Corresponding Hex Code	00	01	02	04	05	06
	NET	GROSS	PEAK	NET	GROSS	PEAK
	N.O.	N.O.	N.O.	N.C.	N.C.	N.C.
	NEGATIVE	NEGATIVE	NEGATIVE	NEGATIVE	NEGATIVE	NEGATIVE
	IMMEDIATE	IMMEDIATE	IMMEDIATE	IMMEDIATE	IMMEDIATE	IMMEDIATE
Corresponding Hex Code	08	09	0A	0C	0D	0E
	NET	GROSS	PEAK	NET	GROSS	PEAK
	N.O.	N.O.	N.O.	N.C.	N.C.	N.C.
	POSITIVE	POSITIVE	POSITIVE	POSITIVE	POSITIVE	POSITIVE
	AFTER STAB	AFTER STAB	AFTER STAB	AFTER STAB	AFTER STAB	AFTER STAB
Corresponding Hex Code	10	11	12	14	15	16
	NET	GROSS	PEAK	NET	GROSS	PEAK
	N.O.	N.O.	N.O.	N.C.	N.C.	N.C.
	NEGATIVE	NEGATIVE	NEGATIVE	NEGATIVE	NEGATIVE	NEGATIVE
	AFTER STAB	AFTER STAB	AFTER STAB	AFTER STAB	AFTER STAB	AFTER STAB
Corresponding Hex Code	18	19	1A	1C	1D	1E

ASCII PROTOCOLS SPECIFICATIONS

THE BAUD RATE

Can be choosen among these values: 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200.

COMUNICATION PARAMETERS

Data Bit , Parity, Stop Bit: 7-E-2 7-N-2 7-O-2 8-N-1 8-E-1 8-O-1 8-N-2

These data concern all the ASCII protocols and depend on the selection made in the "DATA FORMAT" parameter

CONTINUOUS, AUTOMATIC and ON DEMAND PROTOCOLS

When one of these protocols is used, the following data string will be sent over the serial line:

STX	<status>	<net weight>	<gross weight>	<peak value>	ETX	<chksum>	EOT

STX (start of text) = 02h **ETX** (end of text) = 03h **EOT** (end of transmission) = 04h

<status>		= 1 ASCII character consisting of the following:
	"S"	= Stable
	"M"	= Motion
	"O"	= Overload
	"E"	= Error
<net weight>		= 6 ASCII characters
<gross weight >		= 6 ASCII characters
<peak value>		= 6 ASCII characters
<checksum>		= 2 ASCII characters (STX & ETX are not included in the checksum)

NOTE: The brackets **< >** and the characters **" "** **are not sent**, they are only shown for clarification.

The checksum control value is obtained by performing the XOR operation.

It is expressed with 2 Hexadecimal digits. Example: 25 = 1D

The result of the above calculation equals 1 character, which can be a numerical value of 0 to 9 or A to F (Hexadecimal)

Continuous mode

The "Continuous" mode is used to interface with computers, remote displays, or other types of devices that require constant data updating.

Automatic mode

The "Automatic" mode is used to interface with computers or other data acquisition devices. The serial data is transmitted automatically, *upon stabilization* whenever the weight value has increased or decreased more than 20 divisions.

On Demand mode

The "Demand" mode is used to interface with computers and requires a manual command from the front panel keys or a remote contact closure to initiate the output.

COMMUNICATION PROTOCOL TO A REMOTE DISPLAY

When this protocol is used, the following data string will be sent over the serial line:

STX	<status>	<weight >	ETX	<chksum>	EOT

STX (start of text) = 02h **ETX** (end of text) = 03h **EOT** (end of transmission) = 04h

<status> = 1 ASCII character that depends on the following codification:

Center of zero	0x01
Stable weight	0x02
Minimum weight	0x04
Preset tare condition	0x08
Zero performed	0x10
Underload	0x20
Overload	0x40
Offrange	0x80

Then 0x30 will be added.

<weight > = 7 ASCII characters with decimal point included.
According to the selection made in the serial menu, this value represents:

1. Always the NET weight value, independently from the weight (net or gross) displayed by the instrument.
2. Always the GROSS weight value, independently from the weight (net or gross) displayed by the instrument.
3. The weight value matching with the weight (net or gross) displayed by the instrument.

<chksum> = 2 ASCII characters (STX & ETX are not included in the checksum)

NOTE: The brackets **< >** and the characters **" "** **are not sent**, they are only shown for clarification.

The checksum control value is obtained by performing the XOR operation.

It is expressed with 2 Hexadecimal digits. Example: 25 = 1D

The result of the above calculation equals 1 character, which can be a numerical value of 0 to 9 or A to F (Hexadecimal)

THE SLAVE PROTOCOL

The slave mode is used for interfacing with distributed control systems (DCS) or programmable logic controllers (PLC). This mode requires a data request from the master to initiate the output.

In this mode the host sends serial data to the transmitter using the following formats:

WEIGHT VALUE REQUEST

The host sends the following string to the transmitter:

<Addr>	"N"	EOT

After receiving the request, the transmitter responds with the following data string.

<Addr>	"N"	<status>	<net weight>	<tare value>	ETX	<chksum>	EOT

In case of an error, the transmitter will respond with the following data string.

<Addr>	NAK	EOT

AUTOTARE COMMAND

This command performs the same function of the "0" key and/or logic input (1).
It's used to tare the unit when in Net mode.

The host sends the following string to the transmitter:

<Addr>	"tara"	EOT

After receiving the request, the transmitter responds with the following data string:

<Addr>	"tara"	ACK	EOT

In case of an error, the transmitter will respond with the following data string:

<Addr>	"tara"	NACK	EOT

ZERO COMMAND

This command performs the same function of the "0" key and/or logic input (1).
It's used to zero the unit when in Gross mode.

The host sends the following string to the transmitter:

<Addr>	"zero"	EOT

After receiving the request, the transmitter responds with the following data string.

<Addr>	"zero"	ACK	EOT

In case of an error, the transmitter will respond with the following data string.

<Addr>	"zero"	NACK	EOT

<addr> serial address + 80h Example: address 1 would be 1 + 80h = 81h
ETX (end of text) = 03h **EOT** (end of transmission) = 04h

Character strings

<status>		= 1 ASCII character consisting of the following:
	"S"	= Stable
	"M"	= Motion
	"O"	= Overload
	"E"	= Error
<net weight>		= 7 ASCII characters including decimal point
<tare value>		= 7 ASCII characters including decimal point
<checksum>		= 2 ASCII characters (Addr & ETX are not included in the checksum)

NOTE: The brackets **< >** and the characters **" "** **are not sent**, they are only shown for clarification.

The checksum control value is obtained by performing the XOR operation.

It is expressed with 2 Hexadecimal digits. Example: 25 = 1D

The result of the above calculation equals 1 character, which can be a numerical value of 0 to 9 or A to F (Hexadecimal)

THE PROFIBUS-DP AND THE DEVICENET PROTOCOLS

NOTE:
In case of Profibus-DP or DeviceNet options the connection RS422/485 on the terminals 3, 4, 5, 6 **is not available.**

UWT 600
Profibus-DP connector

Pin	Description	Function
Housing	Shield	-
1	Not connected	-
2	Not connected	-
3	B-Line, Positive RS485 Rxd/TxD	Non-inverting RxD/TxD
4	RTS, Request To Send	Request to send
5	GND BUS	GND from RS485
6	+5V BUS	+5 V from RS485
7	Not connected	-
8	A-Line, Negative RS485 RxD/TxD	Inverting RxD/TxD
9	Not connected	-

ADVICES FOR THE PROFIBUS CONNECTION

The cable to be used in a Profibus network is a twisted pair shielded cable.
The cable impedance should be within 100 and 130 Ohm (f > 100 kHz).
The cable capacitance (measured between wire and wire) should be lower than 60 pF/meter.
The minimum section of each single wire shouldn't be lower than 0,22 mm^2
Depending on the performances requested, both "Type A" and "Type B" cables can be used in a Profibus network.
The table here below gives the features of the cable to be used:

FEATURE	"TYPE A" CABLE	"TYPE B" CABLE
Impedance	135 to 165 ohm (f = 3 – 20 MHz)	100 to 300 ohm (f > 100 kHz)
Capacitance	< 30 pF/m	< 60 pF/m
Resistance	< 110 ohm/km	-
Single wire section	> 0,34 mm^2	> 0,22 mm^2

The table here below gives the maximum length of the cable depending on the type (A or B) and the different communication baud rates:

Baud rate (kbit/s)	9.6	19.2	45.45	93.75	187.5	500	1500	3000	6000	12000
"Type A" cable length (meters)	1200	1200	1200	1200	1000	400	200	100	100	100
"Type B" cable length (meters)	1200	1200	1200	1200	600	200	-	-	-	-

ABOUT THE PROFIBUS MODULE INSIDE THE INSTRUMENT (AnyBus-IC PDP)

AnyBus-IC PDP is a module developed for the communication inside a Profibus-DP network and operates as a Profibus-DP **slave** module.

Main features:

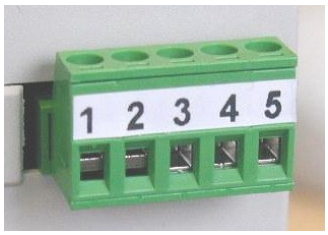
- **32 bytes input / 48 bytes output max.**
  The significant bytes used by the Profibus protocol of the UWT 600 instrument are the following:
  32 for the Profibus Input Area (**32 bytes** from **00** to **31**). See "Profibus/DeviceNet Input Data Area" on page 42.
  22 for the Profibus Output Area (**22 bytes** from **00** to **21**). See "Profibus/DeviceNet Output Data Area" on page 42.

  The AnyBus-IC PDP supports **automatic baudrate detection** from 9,6 kbit/s to 12 Mbit/s, which means that the actual baudrate is only to be configured in the Profibus master.

  The bus power is separated from other electronics via a DC/DC converter.
  The send and receive signals are isolated via opto couplers.

ID Profibus number

The ID Profibus number of the AnyBus-IC module (included in the GSD file) is **1810h**

Pin	Description	UWT 600 DeviceNet connector
1	V -	
2	CAN_L	
3	SHIELD	
4	CAN_H	
5	V +	

ABOUT THE DEVICENET MODULE INSIDE THE INSTRUMENT (AnyBus-IC DNT)

The AnyBus-IC DeviceNet integrates all analog and digital functionality required to communicate on a DeviceNet network into a single chip.

Features

• **Identity Object Customization**
This makes it possible for a configuration tool to identify the module as a special implementation and not as a general AnyBus-IC module.

I/O data
The AnyBus-IC module is configured to handle **32 input bytes** and **48 output bytes.**
The significant bytes in the UWT 600 communication protocol are the following:
32 for the Input Data Area (32 bytes from 00 to 31)
22 for the Output Data Area (22 bytes from 00 to 21)
Supported data types:

- Polled I/O data
- COS/Cyclic I/O data
- Bitstrobe I/O data

- **Application Parameters**

Application specific parameters can be created by the application during startup.

- **Acyclic Data and Parameter Data Mapping**

Application Parameters can be accessed from the fieldbus by mapping them to a Vendor Specific DeviceNet Object.

Compatible Products

This product is a member of the AnyBus concept of interchangeable fieldbus modules. This makes it fully interchangeable with any supported AnyBus-IC fieldbus system. Standardization of mechanical, electrical and software interfaces ensures that the different AnyBus-IC models are fully interchangeable. This also means that the same PCB layout can be used for the different fieldbus systems.

EDS-File

Each device in a DeviceNet network is associated with an EDS-file, containing all necessary Information about the device. This file is used by the network configuration utility during network configuration.
The EDS-file is supplied on a floppy disk or a CD-ROM together with the device
Note: If the information in the Identity Object has been changed, the above EDS file cannot be used.

DeviceNet connector

The recommended connector for DeviceNet is a 5 pole pull-out terminal block. See pinout here above.

Implemented DeviceNet objects

Refer to the "**ABIC-APPENDIX-DEV Rev. 1.10**", chapter 5 (pages 5-1 to 5-8)

Profibus-DP / DeviceNet Input Data Area (reading)

Bytes mapping	Parameter
0 - 1	Instrument error register (*)
2 - 3	Status register (**)
4 - 5	Gross weight value (MSB)
6 - 7	Gross weight value (LSB)
8 - 9	Gross weight Decimal point position
10 - 11	Net weight value (MSB)
12 - 13	Net weight value (LSB)
14 - 15	Net weight Decimal point position
16 - 17	Page number
18 - 19	Register 1 Page x
20 - 21	Register 2 Page x
22 - 23	Register 3 Page x
24 - 25	Register 4 Page x
26 - 27	Register 5 Page x
28 - 29	Register 6 Page x
30 - 31	Register 7 Page x

(*) Instrument error register

Value	Description
00h	Normal operating mode
03h	Offrange condition
05h	Overload condition
07h	Underload condition

Offrange condition = the signal coming from the load cells is over 3.5 mV/V

Overload condition = the weight value is 9 divisions over the "live weight" value

Underload condition = the weight value is 9 divisions below zero

The letter "h" in the "Value" column means that the data must be represented in hexadecimal format.

(**) List of the bits in the 2 Status register bytes (2 – 3)

Bit	Description	Bit's meaning		Example
		0	1	Byte 2 = 1Ah
2.0	Center of zero	NO	YES	**0**
2.1	Stable weight	NO	YES	**1**
2.2	Minimum weight (< 20 div.)	NO	YES	**0**
2.3	Preset tare condition	NO	YES	**1**
2.4	Weight valid	NO	YES	**1**
2.5	Underload condition	NO	YES	**0**
2.6	Overload condition	NO	YES	**0**
2.7	Offrange condition	NO	YES	**0**

If the value received through the **byte nr. 2** is **1Ah**, the result of the conversion from hexadecimal into binary gives the sequence of bits **00011010**. In this sequence of bits the digit at the right hand side matches with the **1st** bit of the byte nr. 2 (**2.0**, Center of zero), therefore the values given in this example are equivalent to:

Center of zero	= **0** = NO
Stable weight	= **1** = YES
Minimum weight (< 20 div.)	= **0** = NO
Preset tare condition	= **1** = YES
Weight valid	= **1** = YES
Underload condition	= **0** = NO
Overload condition	= **0** = NO
Offrange condition	= **0** = NO

PROFIBUS / DEVICENET Output Data Area (dati in scrittura)

Bytes mapping	Parameter
0 – 1	Command register (*)
2 – 3	Sample weight (MSB)
4 – 5	Sample weight (LSB)
6 – 7	Number of the Page (1, 2, 3 or 5) to write or (only for Page 4): Set-point 1 operating mode
8 – 9	Register 1 Page x
10 – 11	Register 2 Page x
12 – 13	Register 3 Page x
14 – 15	Register 4 Page x
16 – 17	Register 5 Page x
18 – 19	Register 6 Page x
20 – 21	Register 7 Page x

(*) List of the "Command register" functions

By writing in the Command Register bytes (0 and 1 of the Output Data Area) any of the values listed here below the relevant function will be performed.

The value 07 (**autotare** command) performs the same function of the "0" key and/or the digital input 1 **when the instrument is switched into "Net mode" (net weight is displayed).**

The value 08 (**Semi-automatic zero** command) performs the same function of the "0" key and/or the digital input 1, **when the instrument is switched into "Gross mode" (gross weight is displayed).**

In order to help the User, the column "Value" represents the values both in decimal and in hexadecimal format.

Value		Function performed	Stored in E2prom
(hex)	(dec.)		
01	1	Write Page 1	NO
02	2	Write Page 2	NO
03	3	Write Page 3	NO
04	4	Write Page 4	NO
05	5	Write Page 5	NO
07	7	Autotare command	NO
08	8	Semi-automatic zero command	NO
09	9	Erase autotare	NO
0B	11	Read Page 1	NO
0C	12	Read Page 2	NO
0D	13	Read Page 3	NO
0E	14	Read Page 4	NO
0F	15	Read Page 5	NO
10	16	Zero calibration command	YES
11	17	Span calibration command (the sample weight value must be written in the bytes 2 – 3 , 4 – 5 of the "Output Data Area")	YES
00FF	255	Reset Page number x	-

IMPORTANT:

By writing the value 10h in the "Command register" the **Zero calibration** will be performed.
During this phase be sure that the weighing system is unloaded; only the dead weight is allowed.

By writing the value 11h in the "Command register" the **Span calibration** will be performed.

Span calibration procedure:

1. Put a known test weight on the weighing system (sample weight) as close as possible to the full scale value (at least 60 % in order to have a good accuracy).
2. Write the sample weight value in the bytes 2-3, 4-5 of the "Output Data Area".
3. Write the value 11h in the Command register bytes in order to perform the span calibration command.

When writing the sample weight value do not consider the possible presence of the decimal point.

Values up to 65535 (FFFF) must be written in the bytes 4 and 5 only.
For values greater than 65535 also the bytes 2 and 3 must be written.

In order to write a weight value greater than 65535 it is necessary to share it in 2 parts, the Most Significant (MSB) and the Least Significant (LSB).
E.g.: the weight value 468980 converted into hexadecimal gives the following sequence of bytes: 00 07 27 F4; the **MSB will be 00 07**, while the **LSB will be 27 F4.**

Therefore:
00 in byte 2
07 in byte 3 | **MSB**
27 in byte 4
F4 in byte 5 | **LSB**

Other examples:

for a weight value of 200 write C8 in the byte 5 (200 decimal = C8 hex).
for a weight value of 32.450 write 7EC2 in the bytes 4 and 5 (32450 decimal = 7EC2 hex).
for a weight value of 387510 write 05 in the byte 3, E9B6 in the bytes 4 e 5.
(387510 decimal = 5E9B6 hex).

The calibration procedures cause the storage of the data in the E2prom.

200	=				C8
Value		00	00	00	C8
Bytes		2	3	4	5

32.450	=			7E	C2
Value		00	00	7E	C2
Bytes		2	3	4	5

387510	=		05	E9	B6
Value		00	05	E9	B6
Bytes		2	3	4	5

READING AND WRITING THE REGISTERS IN THE "PAGES" 1 TO 5

The parameters listed on page 46 are split in 5 different groups of registers (Pages 1 to 5) because the memory of the Anybus IC module is not big enough to handle all the parameters at the same time. Therefore, by splitting the parameters into 5 Pages with a max. length of 14 bytes each (except for Page 4 that is 16 bytes long), it will be possible to write and read the Pages 1 to 5 by using the same part of the memory in different moments.

In order to WRITE the parameters contained in any of the 5 Pages, the PLC Master has to operate as follows:

- Write in the "**Command Register**" (**byte 0 and 1** of the "Output Data Area") the value corresponding to the function "**Write Page x**" (**1 = Page 1, 2 = Page 2, 3 = Page 3, 4 = Page 4, 5 = Page 5**). See the table **"List of the "Command register" functions"** on page 43.
- Write in the **byte 6 and 7** of the "Output Data Area", the number of the Page. (**1 = Page 1, 2 = Page 2, 3 = Page 3, 5 = Page 5**).
  Do not write any number in the bytes 6 and 7 when writing Page 4 because this Page is composed by 8 Registers instead of 7: in this case the bytes 6 and 7 are used to write the Set point 1 operating mode (see also Note **2** on page 46).
- Write in sequence, **from byte 8 to byte 21** of the "Output Data Area", the values of the parameters (Registers 1 to 7) pertaining to the Page.

Based on these events the UWT600 writes the parameters in the selected Page

In order to READ the parameters contained in any of the 5 Pages, the PLC Master has to operate as follows:

- Write in the "**Command Register**" (**byte 0 and 1** of the "Output Data Area") the value corresponding to the function "**Read Page x" (11 (0B) = Page 1, 12 (0C) = Page 2, 13 (0D) = Page 3, 14 (0E) = Page 4, 15 (0F) = Page 5)**.
  See the table **"List of the "Command register" functions"** on page 43.

Based on these events the UWT600 performs the following:

- Performs the command received by the Master
- Returns a number related to the Page just read (*) in the **bytes 16 and 17 of the "Input Data Area"** .
- Returns the data contained in the Page, in the **bytes from 18 to 31 of the "Input Data Area"**

(*) The number returned is: **11 (0B) = Page 1**
12 (0C) = Page 2
13 (0D) = Page 3
14 (0E) = Page 4
15 (0F) = Page 5)

In case of reading or writing again the same page, prior to send the Page Number, the PLC Master has to perform the **"Reset Page Number"** command.
The "Reset Page Number" command consists in writing the code **00FF** in the "Command Register"

The "Reset Page Number" command is not needed if the Page to be read or written is different from the last one read or written.

LIST OF THE PAGES

Pages	Description	Value Range (bounds included)	Note (*)	Stored in E2prom
PAGE 1				
Register 1	Load cell/s total capacity (kg) (MSB)	1 - 999999	(1)	YES
Register 2	Load cell/s total capacity (kg) (LSB)	1 - 999999		YES
Register 3	Load cell 1 sensitivity	10000 - 40000	(7)	YES
Register 4	Load cell 2 sensitivity	10000 - 40000	(7)	YES
Register 5	Load cell 3 sensitivity	10000 - 40000	(7)	YES
Register 6	Load cell 4 sensitivity	10000 - 40000	(7)	YES
Register 7	Number of load cells	1 - 4		YES
PAGE 2				
Register 1	Live weight value (MSB)	1 - Capacity	(2)	YES
Register 2	Live weight value (LSB)	1 - Capacity		YES
Register 3	Dead load value (MSB)	0 - Capacity	(2)	YES
Register 4	Dead load value (LSB)	0 - Capacity		YES
Register 5	Conversion factor (MSB)	0.00100 - 99.00000	(7)	YES
Register 6	Conversion factor (LSB)	0.00100 - 99.00000		YES
Register 7	Display division value	0 - 18	(3)	YES
PAGE 3				
Register 1	Set point 1 value (MSB)	0 - Capacity		YES
Register 2	Set point 1 value (LSB)	0 - Capacity		YES
Register 3	Set point 2 value (MSB)	0 - Capacity		YES
Register 4	Set point 2 value (LSB)	0 - Capacity		YES
Register 5	Baud rate COM1	0 - 7	(4)	YES
Register 6	Baud rate COM2	0 - 7	(4)	YES
Register 7	Instrument's serial address	1 - 32		YES
PAGE 4				
Bytes 6 - 7 Output Data Area	Set point 1 operating mode	See table on page 36	(8)	YES
Register 1	Set point 1 Hysteresis	0 - Capacity		YES
Register 2	Setpoint 1 activation time length	0.0 - 100.0	(7)	YES
Register 3	Setpoint 1 activation delay	0.0 - 100.0	(7)	YES
Register 4	Set point 2 operating mode	See table on page 36	(8)	YES
Register 5	Set point 2 Hysteresis	0 - Capacity		YES
Register 6	Setpoint 2 activation time length	0.0 - 100.0	(7)	YES
Register 7	Setpoint 2 activation delay	0.0 - 100.0	(7)	YES
PAGE 5				
Register 1	Instrument operating mode	0 - 2	(4)	YES
Register 2	Digital filter value	0 - 9		YES
Register 3	Weight stability value	0 - 4		YES
Register 4	Automatic zero range at power on	0.0 - 10.00 (percent.)	(7)	YES
Register 5	Zero traking value	0 - 4		YES
Register 6	Measurement unit	0 - 6	(4)	YES
Register 7	Language	0 - 1	(4)	YES

(*) Refer to the list of Notes on page 32

NOTES

1. **For the Pages 1, 2, 3 and 5** the writing of the Registers must be preceded by the writing of the Page number in the bytes 6 and 7 of the Output Data Area.
2. **Only for Page 4:** in the bytes 6 and 7 of the Output Data Area the "Set-point 1 operating mode" must be written instead of the "Page number" because the Registers in this Page are 8 while the maximum capacity of the Page is 7 only. For this reason the bytes 6 and 7, that are normally used to write the Page number, in this case they are used to write the additional Register in Page 4.

THE "GSD" FILE *(for the **Profibus-DP** module)*

```
;============================================================
; Profibus Device Database of HMS Industrial Networks.
;
; Model :       Anybus-IC DP-V0
; Description : Anybus-IC DP-V0 slave
; Language :    English
; Date :        16 March 2007
; Author :      HMS Industrial Networks
;
; Revision log:
;
; 2006-10-02:   Updated revision information. Cleared old
;               revision history.
; 2007-03-16:   Updated revision information.
; 2007-03-16:   Updated SW revision information.
; 2007-09-18:   Updated SW revision information.
;
;============================================================

#Profibus_DP

GSD_Revision        = 3

; Device identification
Vendor_Name         = "HMS Industrial Networks"
Model_Name          = "Anybus-IC DP-V0"
Revision            = "Version 2.06"
Ident_Number        = 0x1810
Protocol_Ident      = 0             ; DP protocol
Station_Type        = 0             ; Slave device
FMS_supp            = 0             ; FMS not supported
Hardware_Release    = "Version 2.3"
Software_Release    = "Version 2.06"

;Used bitmap
Bitmap_Device = "ABIC_DE"
Bitmap_Diag   = "ABIC_DI"
Bitmap_SF     = "ABIC_SF"

; Supported baudrates
9.6_supp            = 1
19.2_supp           = 1
45.45_supp          = 1
93.75_supp          = 1
187.5_supp          = 1
500_supp            = 1
1.5M_supp           = 1
3M_supp             = 1
6M_supp             = 1
12M_supp            = 1
```

```
; Maximum responder time for supported baudrates
MaxTsdr_9.6         = 15
MaxTsdr_19.2        = 15
MaxTsdr_45.45       = 15
MaxTsdr_93.75       = 15
MaxTsdr_187.5       = 15
MaxTsdr_500         = 15
MaxTsdr_1.5M        = 25
MaxTsdr_3M          = 50
MaxTsdr_6M          = 100
MaxTsdr_12M         = 200

; Supported hardware features
Redundancy          = 0       ; not supported
Repeater_Ctrl_Sig   = 2       ; TTL
24V_Pins            = 0       ; not connected
Implementation_Type = "NP30"

; Supported DP features
Freeze_Mode_supp    = 1       ; supported
Sync_Mode_supp      = 1       ; supported
Auto_Baud_supp      = 1       ; supported
Set_Slave_Add_supp  = 1       ; supported

; Maximum polling frequency
Min_Slave_Intervall = 1       ; 100 us

; Maximum supported sizes
Modular_Station     = 1       ; modular
Max_Module          = 24
Max_Input_Len       = 144
Max_Output_Len      = 144
Max_Data_Len        = 288
Modul_Offset        = 1

Fail_Safe           = 1       ; Data telegram without data in state CLE-
AR accepted

Slave_Family        = 0
Max_Diag_Data_Len   = 6

; Definition of modules
Module = "IN/OUT:  32 Byte (16 word)" 0x7F
EndModule
;
Module = "OUTPUT:  16 Byte ( 8 word)" 0x67
EndModule
;
```

NOTE:

0x7F corresponds to: "IN/OUT: 32 Byte (16 word)
0x67 corresponds to: "OUTPUT: 16 Byte (8 word)

This means that the PLC master has to be configured to handle **32 Input bytes** and **48 output bytes**.

THE "EDS" FILE *(for the **DeviceNet** module)*

```
[File]
      DescText = "HMS Anybus-IC DEV";
      CreateDate = 11-22-2001;
      CreateTime = 07:23:00;
      ModDate = 03-14-2007;
      ModTime = 14:30:00;
      Revision = 3.1;

[Device]
      VendCode = 90;
      VendName = "HMS Networks";
      ProdType = 12;
      ProdTypeStr = "Communications Adapter";
      ProdCode = 61;
      MajRev = 3;
      MinRev = 1;
      ProdName = "Anybus-IC DeviceNet";
      Catalog = "Anybus-IC DeviceNet";

      DNetQC =
            0x0001,        $ Quick Connect supported at Powerup
            265;          $ 265 ms Powerup time

[IO_Info]
      Default = 0x0001;      $ Default IO Connection = Poll

      PollInfo =
            0x000F,        $ Compatible IO type mask = All connections
            1,             $ Input1
            1;             $ Output1

      StrobeInfo =
            0x000F,        $ Compatible IO type mask = All connections
            1,             $ Input1
            1;             $ Output1

      COSInfo =
            0x0007,        $ Compatible IO type mask = All connections
            1,             $ Input1
            1;             $ Output1

      CyclicInfo =
            0x000B,        $ Compatible IO type mask = All connections
            1,             $ Input1
            1;             $ Output1

      Input1 =
            1,                  $ 1 byte
            0,                  $ All bits are significant
            0x000F,             $ Compatible IO type mask = All connections
            "ABIC Produce",        $ Name
            6,                  $ Path size
            "20 04 24 64 30 03",    $ Assembly object, Inst 100, Attr 3
            "Data produced by the Anybus-IC";

      Output1 =
            1,                  $ 1 byte
            0,                  $ All bits are significant
            0x000F,             $ Compatible IO type mask = All connections
            "ABIC Consume",        $ Name
            6,                  $ Path size
            "20 04 24 96 30 03",    $ Assembly object, Inst 150, Attr 3
            "Data consumed by the Anybus-IC ";

[ParamClass]
      MaxInst = 0;                $ Max Instances - total # configuration parameters
      Descriptor = 0x0000;          $ Parameter Class Descriptor - No parameters
      CfgAssembly = 0;              $ The config assembly is not supported.
```

The PLC master has to be configured to handle 32 Input bytes and 48 output bytes

THE ETHERNET COMMUNICATION

INSTRUCTIONS

The “Ethernet” option (named “**Digi Connect Me**”) installed inside the UWT 600 allows the instrument to exchange data inside an ethernet network.
The communication is handled by the asynchronous serial line COM2 of the UWT 600 instrument.

PC software installation:

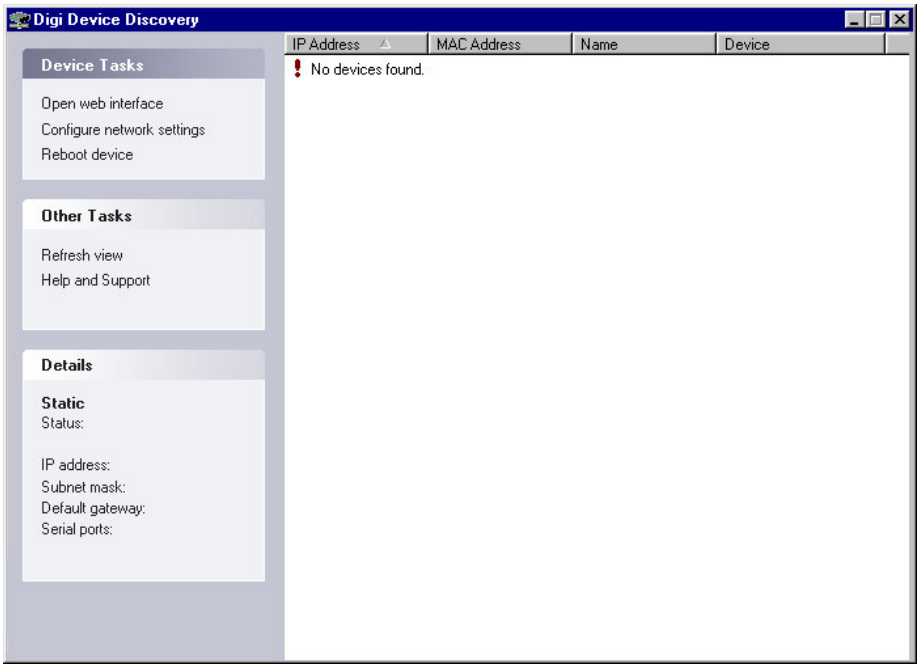
Insert the CD-ROM in the PC drive and wait for the automatic start of the installation program (“**Digi connect integration kit**”). Follow the installation wizard and proceed step by step until the installation is completed.

Before starting to operate, the “**Digi Connect Me**” module needs to be configured through the “**JAVA 2 Runtime Environment**”, if this application is missing in the PC please browse the CD-ROM and click twice on the “**j2re-1_4_1_03-windows-i586**” set-up icon, this will install the “**JAVA Plug-in 1.4.1**” in the PC.

In case the PC is not Windows based please download the right version of “**JAVA Plug-in 1.4.1**” (or a more recent version) from the Internet.

“Digi Connect Me” module configuration:

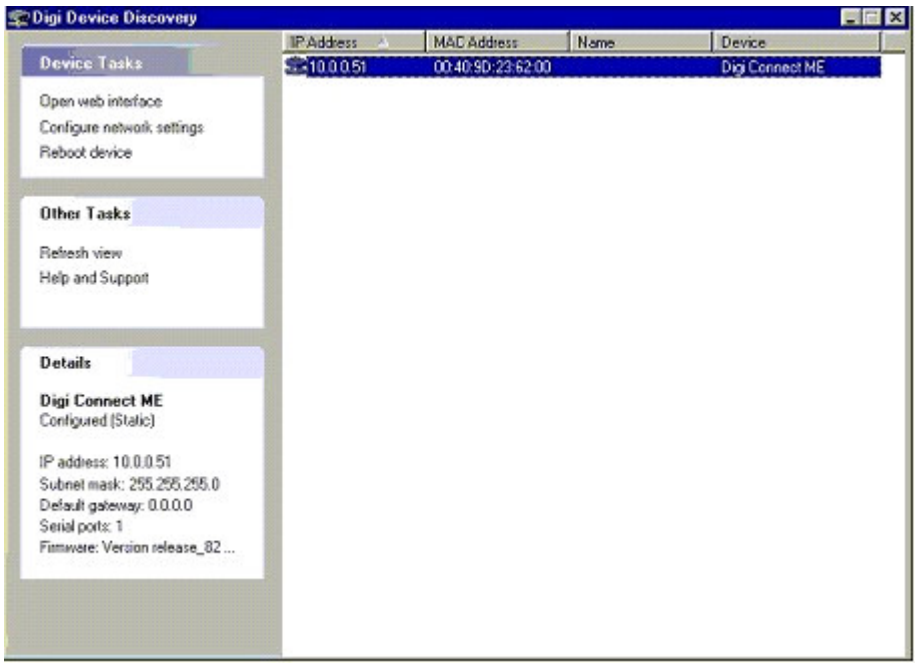
Click on **START** – **ALL PROGRAMS:** “**Digi connect integration kit**”.
Start the “**Digi Device Discovery**” application.
The following screen will appear.



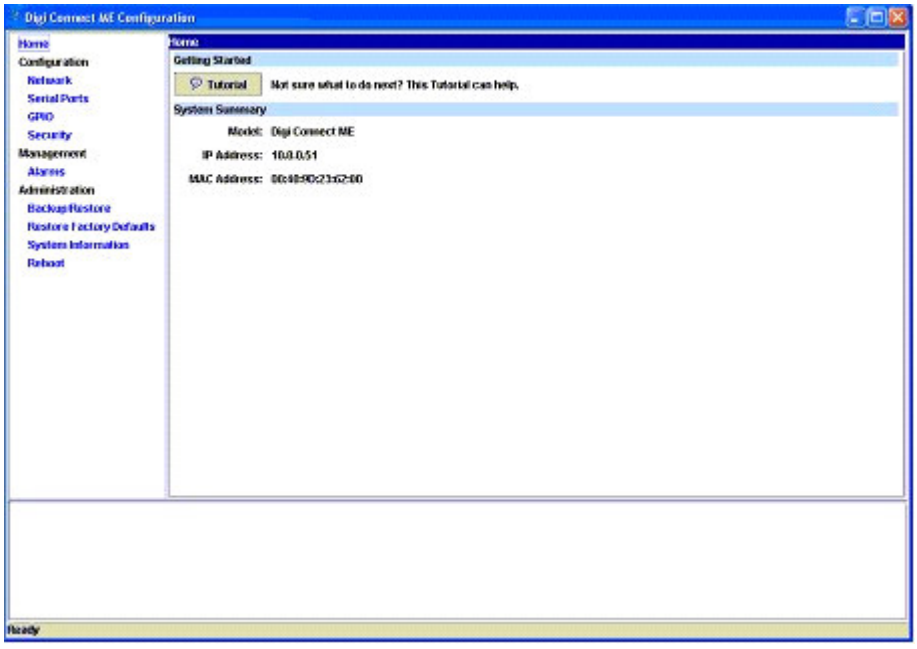
By using a standard Ethernet cable connect the UWT 600 to the Ethernet network and apply power to the instrument.
The 2 led (yellow and green) light on when applying power, than the green one will blink during the communication while the yellow one will be always on.

Click on the line “**No devices found**” to highlight it, then click on “**Refresh view**” under the “**Other Tasks**” section.

The following screen will appear (if not, try again).



Click on "**Open web interface**" to configure the "**Digi Connect Me**" module.
The "**Digi Connect Me Configuration**" program will start and the following screen will appear:



Note:
In case the "**JAVA Plug-in 1.4.1**" application is not correctly installed in the PC, the above screen will not appear and the PC will try to download it from the internet.
In case the "**JAVA Plug-in 1.4.1**" application is correctly installed, but the PC tries to access the Internet, please enable the Internet communication "off-line"

The configuration procedure is composed by different sections and allows to set-up all the parameters of the "**Digi Connect Me**" module.

The "Network" section allows to enter the parameters defined by the network administrator.

The "Serial ports" section allows to configure the communication parameters between the microprocessor of the UWT 600 and the "**Digi Connect Me**" module inside the instrument. **These parameters have to match with the ones previously programmed in the instrument for the COM2 port (Baud rate, Data bits, Parity, Stop bits)**

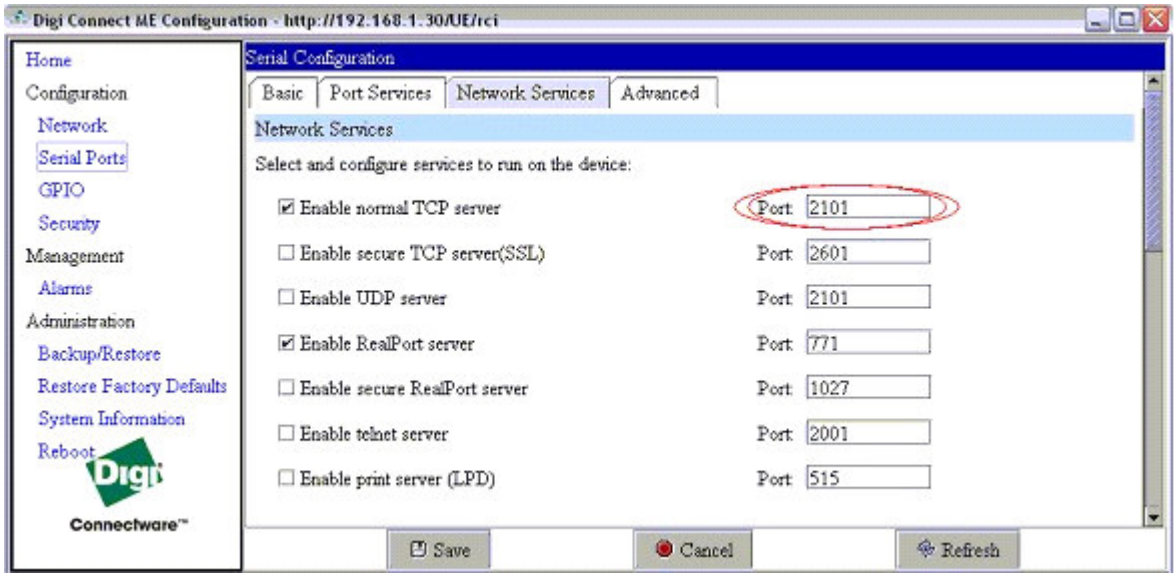
The "GPIO" and "Alarms" sections are not yet used.

For more details click on **START – ALL PROGRAMS:** "**Digi connect integration kit**" and refer to the documents contained in the directory "**Docs**".

When the "**Digi Connect Me**" module has been programmed with the right IP Address, the communication can start. The data strings are those handled by the COM2 port of the UWT 600 instrument.

In order to perform a very easy communication test the "Hyper Terminal" application can be used:

- Configure the COM2 protocol of the UWT 600 as "Continuous" transmission.
- Run the Hyper Terminal application on the PC and create a new connection
- Name the connection and click on "OK"
- Select the port to be used for the communication with the instrument (choose "**TCP/IP Winsock**")
- Enter the IP Address of the "**Digi Connect Me**" module in the "Host address" field
- Enter the Port Number in the "Port Number" field. The Port Number can be easily found inside the "**Digi Connect Me Configuration**" program as shown here below:



- By clicking on "OK" the Hyper Terminal application starts to receive data from the instrument

To perform a communication test it is also possible to use the "Real Port" driver (browse the CD-ROM to install it). Since this software allows to handle the IP Address as like as a serial port, any communication software can be used to exchange data with the UWT 600 instrument.

Please note that any standard programming environment (like Visual Basic 6) allows to handle the ethernet network functions.

For more details click on **START – ALL PROGRAMS:** "**Digi connect integration kit**" and refer to the documents contained in the directory "**Docs**".

EC DECLARATION OF CONFORMITY

CE

We: **Pavone Sistemi Srl**
Via dei Chiosi, 18
Cavenago Brianza (MI)

Hereby declares that the product: **UWT 600** Weight Indicator & Analog Digital Transmitter complies with the essential requirements of the directives 73/23/CEE, 89/336/CEE, 93/68/CEE, when used for its intended purpose

The instrument is manufactured and tested in accordance with the following standards:

ELECTROMAGNETIC COMPATIBILITY:

EN 61000-6-2
EN 61000-6-3

ELECTRICAL SAFETY:

EN 61010-1

The CE mark has been applied on the product

Cavenago, April 27th, 2004

The Manager

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