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Communication Protocols

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P/N HealthometerProf.CommunicationProtocolsREV20220114

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Thank you for choosing Health o meter® Professional as your scale provider! The information outlined below includes everything you should need to get the data from the scale into your EMR or other digital application. Please contact our Technical Support line at 800-815-6615 if you have any questions.

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Health o meter® Professional scale display heads have a Silabs Cp210x USB bridge chip. The power for the chip is obtained from the USB host which is usually a PC.

We also have a wireless solution available. We provide a pre-paired USB/BT dongle that has the same Silabs bridge chip. Any application software written to communicate through a hardwired connection will function wirelessly without any modification needed.

If your application is going to communicate with the scales using VSP the following will be of interest:

The latest Windows® VSP drivers for the chip can be obtained from Silabs.
http://www.silabs.com/products/development-tools/software/usb-to-uart-bridge-vcp-drivers

Here is a link to a sample C# program that may be helpful in your development.
www.homscales.com/wp-content/uploads/2022/01/Pelstar_Sample_Blue_USB.zip

A quick way to troubleshoot problems on your program is to use terminal programs that are available on the web. You can see the packets as they are sent from the scale as well as understand the workflow of the scale. Here are links to a couple of useful terminal programs:
https://sourceforge.net/projects/realterm/
https://ttssh2.osdn.jp/index.html.en

See the following pages for the protocol for the particular scale model you want to connect to.

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Protocol and Operation

498KL, 499KL, 500KL

Protocol

- **Transmission Parameters**

Baud Rate	9600
Parity	None
Data Bits	8
Stop Bits:	1
Start Bits:	1

- **Sample Data Packet**

  <ESC> = 1BH

  <ESC>R<ESC>I1234567890<ESC>W184.50<ESC>H84.00<ESC>B24.10<ESC>Nc<ESC>E

Leading Letter	Field	Value	Length*[1]
R	Read	N / A	1 character
I	Patient ID	1234567890	11 characters
W	Weight	184.50	7 characters*[2]
H	Height	84.00	4 and 6 characters*[2]
B	BMI	24.10	4 and 6 characters*[2]
N	Units	m = Metric c = Imperial	2 character
E	End	N / A	1 character

***Note 1: Length includes the leading letter for the field**
***Note 2: Trailing zeros are added for unused character after the decimal point**

Scale Operation

- **Weight Locked Mode**

  1. Turn scale on. Scale auto zeroes. No data is streamed.
  2. Stand on scale. Scale determines and locks weight. Data packets are streamed once/second. If the weight value displayed on the scale LCD is 0.0 or while scale is calculating weight, data will not be streamed.
  3. If the BMI button is pressed, the weight data stream continues. The Display will prompt user to enter the Height in order to calculate the BMI. When the BMI is calculated the data stream is updated to include height and BMI. In BMI mode, pressing the BMI or LB/KG button will not change anything on the display or the data stream.

4. To exit BMI mode, press the CLEAR button. Height and BMI will reset to 0.0. If the weight is still on the scale, it will reweigh; when the weight locks, the data will stream once/second.
5. If the weight is locked, when the HOLD button is pressed the data stream continues once/second.
6. When HOLD button is pressed to release the weight, if weight is still on the scale and the weight is locked, the data will continue streaming at once/second.
7. While the weight is locked, pressing the UNIT button will change the units of the weight on the display and the data will stream with the new units once/second.
8. When weight is removed from the scale, the data stream will cease.

End of Protocol

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Protocol and Operation

501KL

Protocol

- **Transmission Parameters**

Baud Rate	9600
Parity	None
Data Bits	8
Stop Bits:	1
Start Bits:	1

- **Sample Data Packet**

<ESC> = 1BH

<ESC>R<ESC>I1234567890<ESC>W184.5<ESC>H84.0<ESC>B24.1<ESC>T0.0<ESC>Nc<ESC>E

Leading Letter	Field	Value	Length*[1]
R	Read	N / A	1 character
I	Patient ID	1234567890	11 characters
W	Weight	184.5	4 to 6 characters*[2]
H	Height	84.0	4 to 6 characters*[2]
B	BMI	24.1	4 to 5 characters*[2]
T	Tare	0.0	4 to 6 characters*[2]
N	Units	m = Metric c = Imperial	2 character
E	End	N / A	1 character

***Note 1: Length includes the leading letter for the field**
***Note 2: Leading zero suppression and one decimal point**

Scale Operation

- **Weight Locked Mode**

1. Turn scale on. Scale auto zeroes. No data is streamed.
2. Stand on scale. Scale determines weight and locks weight. Data packets are streamed once/second.
3. If the BMI button is pressed, the data stream is stopped until the enter button is pushed to calculate the BMI. After pressing ENTER, the data stream will continue once/second. The new data stream will contain the weight, height, BMI and tare weight. The display will show the weight and height in small characters and BMI in large characters.

4. To exit the BMI mode, press ZERO/CLEAR button. Height and BMI will reset to 0.0. If the weight is still on the scale, the scale will stay locked and stream data once/second.
5. If weight is locked, when the HOLD button is pressed the data stream continues once/second.
6. When HOLD button is pressed to release the weight, if weight is still on the scale and the weight is locked, the data stream will continue once/second.
7. While the weight is locked, if the UNIT button is pressed, the display will show the weight in new units momentarily until the unit button is released. No data is streamed while the UNIT button is pressed. When the UNIT button is released, the data stream continues once/second with the original units.
8. If the REWEIGH button is pressed, the data stream will stop until the new weight is calculated and then the data stream will resume once/second.
9. When the weight is removed from the scale, the data stream will cease.
10. If the RECALL button is pressed, the previous weight will be displayed on the scale but no data will be streamed.

End of Protocol

Protocol and Operation

597KL, 599KL, 752KL

Protocol

- **Transmission Parameters**

Baud Rate	9600
Parity	None
Data Bits	8
Stop Bits:	1
Start Bits:	1

- **Sample Data Packet**

  <ESC> = 1BH

  <ESC>R<ESC>I1234567890<ESC>W184.5<ESC>H84.0<ESC>B24.1<ESC>Nc<ESC>E

Leading Letter	Field	Value	Length*[1]
R	Read	N / A	1 character
I	Patient ID	1234567890	11 characters
W	Weight	184.5	4 to 6 characters*[2]
H	Height	84.0	4 to 5 characters*[2]
B	BMI	24.1	4 to 5 characters*[2]
N	Units	m = Metric c = Imperial	2 character
E	End	N / A	1 character

***Note 1: Length includes the leading letter for the field**
***Note 2: Leading zero suppression**

Scale Operation

- **Weight Locked Mode**
  - **Firmware Version: 3.1.13**

1. Turn Scale On. Scale auto zeroes. No data is streamed.
2. Stand on scale. Scale determines weight and locks weight. Data packets are streamed once/second.
3. If the BMI button is pressed, the data stream stops. After the height is entered and the ENTER button is pressed, the data stream continues to stream with weight, height and BMI once/second. In BMI mode, pressing the BMI button or the UNIT button will not affect the display or the data stream.

4. To exit BMI mode, press the CLEAR button. Height and BMI will reset to 0.0. If the weight is still on the scale, it will reweigh; once the new weight locks, the data will stream once/second.
5. If the weight is locked, when the HOLD button is pressed, the data stream continues once/second.
6. When the HOLD button is pressed to release the weight, if the weight is still on the scale and the weight is locked the data will continue streaming once/second.
7. While the weight is locked, pressing the UNIT button will change the units of the weight on the display and the data will stream with the new units once/second.
8. Once the weight is removed from the scale, the data stream will cease.

- **Firmware Version: 3.1.12**

1. Turn scale on. Scale auto zeroes. Data is streamed once/second.
2. Stand on scale. Data streams once/second while the scale is measuring the weight; the weight in the data stream is shown on the scale's display.
3. If the BMI button is pressed, the data stream stops. The data stream will continue once/second when the ENTER button is pressed to calculate the BMI. The display will show the BMI and the data stream will contain the weight, height, and BMI. In BMI mode, pressing the BMI button does not affect the display or the data stream and the data will stream once/second.
4. To exit the BMI mode, press the CLEAR button. Height and BMI will reset to 0.0. If the weight is still on the scale, the weight will stay locked and the scale will stream the weight once/second.
5. If the HOLD button is pushed, the data stream will continue once/second.
6. When the RELEASE button is pressed to clear the HOLD, if weight is still on the scale, the data stream will continue once/second.
7. If the UNITS button is pressed, the display will show the weight in the selected unit. The unit field and converted weight measurement will be updated and will stream once/second.
8. When the weight is removed from the scale, the data stream will continue with weight field set to zero.

End of Protocol

Protocol and Operation

600KL

Protocol

- **Transmission Parameters**

Baud Rate	9600
Parity	None
Data Bits	8
Stop Bits:	1
Start Bits:	1

- **Sample Data Packet**

  <ESC> = 1BH

  <ESC>R<ESC>I1234567890<ESC>W184.5<ESC>H84.0<ESC>B24.1<ESC>Nc<ESC>E

Leading Letter	Field	Value	Length*[1]
R	Read	N / A	1 character
I	Patient ID	1234567890	11 characters
W	Weight	184.5	4 to 6 characters*[2]
H	Height	84.0	4 to 5 characters*[2]
B	BMI	24.1	4 to 5 characters*[2]
N	Units	m = Metric c = Imperial	2 character
E	End	N / A	1 character

***Note 1: Length includes the leading letter for the field**
***Note 2: Leading zero suppression**

Scale Operation

- **Weight Locked Mode**
  - **Firmware Version: 3.2.04**

1. Turn scale on. Scale auto zeroes. No data is streamed.
2. Stand on scale. Scale determines weight and locks weight. Data packets are streamed once/second.
3. If the BMI button is pressed, the data stream stops. Position height rod to select the height and press BMI again. The display will show the calculated BMI. To send the weight, height and BMI data, press the SEND button and data will stream once/second. In BMI mode, pressing the BMI button toggles between

weight, height and BMI on the display but the data stream remains the same and transmits once/second. When UNIT button is pressed while in BMI mode, the data stream is not affected and will stream once/second.

4. To exit BMI mode, press the RESET button. Height and BMI will reset to 0.0. If the weight is still on the scale, it will reweigh; once the new weight locks, the data will stream once/second.
5. If the weight is locked when the HOLD button is pressed, the data stream continues once/second.
6. When the HOLD button is pressed to release the weight, if the weight is still on the scale and the weight is locked, the data will continue streaming once/second.
7. While the weight is locked, pressing the UNIT button will change the units of the weight on the display and the data will stream with the new units once/second.
8. Once the weight is removed from the scale, the data stream will cease.

- **Firmware Version: 3.2.02**

1. Turn scale on. Scale auto zeroes. Data begins streaming once/second.
2. Stand on scale. Data is streamed once/second. Weight field will indicate current value regardless of whether scale has locked.
3. If the BMI button is pressed, the data stream stops. Position height rod to select the height and press the SEND button. The data stream will restart, sending data once/second; weight, height and BMI will be streamed. Once locked, the data will not change if the weight or height change.
    - If the height rod has not been moved after power up and the SEND button is pressed after the BMI button is pressed, the data packet will contain garbage in the height field.
4. To exit the BMI mode, press the RESET button. Height and BMI will reset to 0.0. If the weight is still on the scale, the data is streamed once/second.
5. If the weight is locked when the HOLD button is pressed, the current weight will be streamed once/second.
6. If the RELEASE button is pressed and the weight is still locked on the scale, the data will continue streaming once/second.
7. While the weight is locked, pressing the UNIT button will change the units of the weight on the display and the data will stream with the new units once/second.

8. Once the weight is removed from the scale, the data stream will cease.
9. If the scale is tipped back on its wheels and set back down, the scale will send data packets with an erroneous weight until the ZERO button is pressed.

End of Protocol

Protocol and Operation

2595KL

Protocol

- **Transmission Parameters**

Baud Rate	2400
Parity	None
Data Bits	8
Stop Bits:	1
Start Bits:	1

- **Sample Data Packet**

02 80 D7 E4 31 32 33 2E 34 0D

Field	Value	Sample	Length*[1]
Start	02 = STX	02	1 character
Unit	80 = Imperial 82 = Metric	82	1 character
NO VALUE	D7	D7	1 character
NO VALUE	E4	E4	1 character
Weight	123.4	31, 32, 33, 2E, 34	5 characters
Carriage Return (End)		0D	1 character

***Note 1: Length is 5 characters (xxx.x) and includes leading and trailing zeroes as needed.**

Scale Operation

- **Prior to date code 4215**

1. Turn scale on. Scale auto zeroes. Data is streamed at about 4 packets per second rate.
2. Sit on scale. Data stream will stop until final weight is determined. When final weight is displayed the current weight data will stream at about 4 packets a second rate but if the scale detects a slightly new weight the packets will stop for a period of time. The weight in the packet will not change.
3. Once weight is removed from scale weight data packets will stop being sent unless a weight close to the previous weight is detected again in which case the previous weight will be sent in continuous packets.

4. If the UNITS button is pushed when the data packets have ceased being sent one new packet will be sent with the weight converted to the current units and the corresponding units data byte will be set accordingly.
5. If the arm rest is pulled up with no weight in chair the display will read UL and may display an erroneous weight which will then be sent continuously until the ZERO button is pushed.

- **Date code 4215 and later**

1. Turn scale on. Scale auto zeroes and no data is sent. Anytime display reads zero no packets will be sent.
2. Stand on Scale. Once scale locks data packets will be sent about once a second.
3. If weight is removed data will continually be sent until reweigh or zero button is pushed.
4. If arm rest is pulled up with no weight on chair the display will read UL and when arm rest is release scale may display a weight. If a weight is display the data packets will be sent with the erroneous weight. Reweigh button will have no effect. Only way to clear the display is to hit the zero button.

End of Protocol

Protocol and Operation

3102KL-AM (Firmware Version: 3.3.04 and later)

Protocol

- **Transmission Parameters**

Baud Rate	9600
Parity	None
Data Bits	8
Stop Bits:	1
Start Bits:	1

- **Sample Data Packet**

  <ESC> = 1BH

  <ESC>R<ESC>I1234567890<ESC>W184.5<ESC>H84.0<ESC>B24.1<ESC>Nc<ESC>E

Leading Letter	Field	Value	Length*[1]
R	Read	N / A	1 character
I	Patient ID	1234567890	11 characters
W	Weight	184.5	4 to 6 characters*[2]
H	Height	84.0	4 to 5 characters*[2]
B	BMI	24.1	4 to 5 characters*[2]
N	Units	m = Metric c = Imperial	2 character
E	End	N / A	1 character

***Note 1: Length includes the leading letter for the field**
***Note 2: Leading zero suppression**

Scale Operation

- **Weight Locked Mode**

  1. Turn Scale on. Scale auto zeros. No data is streamed.
  2. Stand on the scale. Scale determines the weight and locks weight. Data packets are streamed once/second.
  3. If weight is locked when HOLD button is pressed it does not affect the data stream.

4. When the HOLD button is pressed to release the weight, if the weight is still on the scale and the weight is locked, the data will continue streaming once/second.
5. When weight is locked, pressing the LB/KG button converts the weight into the new selected unit on the scale's display and updates the data stream with new units and weight value.
6. If the REWEIGH button is pressed, the data stream will stop until the scale recalculates and locks weight. Data packets will resume streaming once/second.
7. When the weight is removed from the scale, the data stream will cease.
8. If the RECALL button is pressed, the previous weight will be displayed on the scale but no data will be streamed.

End of Protocol

Protocol and Operation

522, 524, 553 (KL and KG Models)

Protocol

- **Transmission Parameters**

Baud Rate	2400
Parity	None
Data Bits	8
Stop Bits:	1
Start Bits:	1

- **Sample Data Packet**

  02 82 D7 E4 30 30 34 2E 39 39 30 0D or 01 82 D7 E4 30 30 34 2E 39 39 30 0D

Field	Value	Sample	Length*[1]
Start	01 = SOH 02 = STX	02	1 character
Unit	80 = Imperial 82 = Metric	82	1 character
NO VALUE	D7	D7	1 character
NO VALUE	E4	E4	1 character
Weight	004.990	30 30 34 2E 39 39 30	7 characters
Carriage Return (End)		0D	1 character

***Note 1: Length is 7 characters (xxx.xxx) and includes leading and trailing zeroes as needed.**

Scale Operation

- **Weight Locked Mode**
  - **522KL and 524KL**
    1. Turn scale on. Scale auto zeroes. Data begins streaming once/second.
    2. The streamed weight will be whatever is on the display and will continue at once/second.
    3. When the HOLD/RELEASE button is pressed, the data stream will stop until the HOLD/RELEASE button is pressed again.
    4. While weight is locked, pressing the LB/KG button changes the units of weight on the display and the data will stream the weight with the new unit.
    5. The data will continue to stream once/second until the scale is turned off.

- **553KL**

  1. Turn scale on. Scale auto zeroes. Data begins streaming once/second.
  2. The streamed weight will be whatever is on the display, and will continue at once/second.
  3. The scale will activate the HOLD function as soon as the weight locks. The locked weight is streamed once/second.
  4. To release the weight, press the RELEASE button and the scale will reweigh. The data continues to stream the weight displayed on the LCD.
  5. While the weight is locked, pressing the LB/KG button changes the units of weight on the display and the data will stream the weight with the new unit.
  6. When there is weight on the scale, pressing the ZERO/CLEAR button tares the weight. The data stream will continue with 0.0 as the weight.
  7. If there is no weight on the scale, the scale will display 0.0 and the data stream will continue once/second with 0.0 as the weight. If a tared weight is removed from the scale, the data stream will continue with 0.0 as the weight; it will not stream a negative weight.
  8. The data will continue to stream once/second until the scale is turned off.

End of Protocol

Protocol and Operation

1100, 2000, 2101, 2400, 2500, 2600, 2610, 2650, 2700, 3001

"E" Version Serial Numbers (KL and KG Models)

Protocol

- **Transmission Parameters**

Baud Rate	9600
Parity	None
Data Bits	8
Stop Bits:	1
Start Bits:	1

- **Sample Data Packet**

  <ESC> = 1BH

  <ESC>R<ESC>I1234567890<ESC>W184.5<ESC>H84.0<ESC>B24.1<ESC>T0.0<ESC>Nc<ESC>E

Leading Letter	Field	Value	Length*[1]
R	Read	N / A	1 character
I	Patient ID	1234567890	11 characters
W	Weight	184.5	4 to 6 characters*[2]
H	Height	84.0	4 to 6 characters*[2]
B	BMI	24.1	4 to 5 characters*[2]
T	Tare	0.0	4 to 6 characters*[2]
N	Units	m = Metric c = Imperial	2 character
E	End	N / A	1 character

***Note 1: Length includes the leading letter for the field**
***Note 2: Leading zero suppression and one decimal point**

Scale Operation

- **Weight Locked Mode**

  1. Turn scale on. Scale auto zeroes. No data is streamed.
  2. Stand on scale. Scale determines weight and locks weight. Data packets are streamed once/second.
  3. If the BMI button is pressed, the data stream is stopped until the enter button is pushed to calculate the BMI. After pressing ENTER, the data stream will continue once/second.

The new data stream will contain the weight, height, BMI and tare weight. The display will show the weight and height in small characters and BMI in large characters.

4. To exit the BMI mode, press ZERO/CLEAR button. Height and BMI will reset to 0.0. If the weight is still on the scale, the scale will stay locked and stream data once/second.
5. If weight is locked, when the HOLD button is pressed the data stream continues once/second.
6. When HOLD button is pressed to release the weight, if weight is still on the scale and the weight is locked, the data stream will continue once/second.
7. While the weight is locked, if the UNIT button is pressed, the display will show the weight in new units momentarily until the unit button is released. No data is streamed while the UNIT button is pressed. When the UNIT button is released, the data stream continues once/second with the original units.
8. If the REWEIGH button is pressed, the data stream will stop until the new weight is calculated and then the data stream will resume once/second.
9. When the weight is removed from the scale, the data stream will cease.
10. If the RECALL button is pressed, the previous weight will be displayed on the scale but no data will be streamed.

End of Protocol

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Protocol and Operation

1100, 2000, 2101, 2400, 2500, 2600, 2610, 2650, 2700, 3001

"L" Version Serial Numbers

Protocol

- **Transmission Parameters**

Baud Rate	9600
Parity	None
Data Bits	8
Stop Bits:	1
Start Bits:	1

- **Sample Data Packet**

<ESC> = 1BH
<ESC>R<ESC>I1234567890<ESC>W184.5<ESC>H84.0<ESC>B24.1<ESC>T0.0<ESC>Nm<ESC>E
Note: Single packet or first packet of a continuous stream
6R<ESC>I1234567890<ESC>W184.5<ESC>H84.0<ESC>B24.1<ESC>T0.0<ESC>Nm<ESC>E

Leading Letter	Field	Value	Length*[1]
R	Read	N / A	1 character
I	Patient ID	1234567890	10 characters
W	Weight	184.5	3 to 5 characters*[2]
H	Height	84.0	3 to 4 characters*[2]
B	BMI	24.1	3 to 4 characters*[2]
T	Tare	0.0	3 to 4 characters*[2]
N	Units	m = Metric c = Imperial	2 character
E	End	N / A	1 character

***Note 1: Length includes the leading letter for the field**
***Note 2: Leading zero suppression and one decimal point**

Scale Operation

1. Turn scale on. Scale auto zeroes. No data is streamed.
2. Stand on scale. Scale determines weight and locks weight. Data packets are streamed once a second.
3. Once scale is stepped off the data packets will cease.

4. If the BMI button is pushed the data stream is stopped until the enter button is pushed. The data stream will again continue at a one second rate. The data stream will contain the weight, height and BMI and the display will show the BMI. If the enter button is pushed again the scale will recalculate weight and send data packets with the new weight. The height and BMI will be set to zero.
5. If the RECALL button is pushed the previous weight will be sent once.
6. If the UNITS button is pushed the previous weight will be sent once and the weight will be converted to the new units.
7. If the REWEIGH button is pushed the data stream will stop until the new weight is calculated and then the data stream will resume.
8. If the scale is tipped back on its wheels and set back down the scale will send data packets with an erroneous weight until the zero button is pushed.

End of Protocol