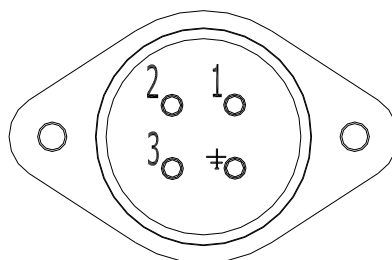


RS232: PRINTER AND PC CONNECTIONS



RS232 output (female)

| Ordered functionality | printer | | pc | |
|--------------------------|----------------------|----------------------|-------------------|------------------|
| Pin number | Indicator side | Printer side | Indicator side | Pc side |
| 1 | (+12VDC) Optional | (+12VDC) Optional | Not Connected | Not Connected |
| 2 | GND | GND | GND | GND |
| 3 | TX | RX | TX | RX |
| 4 | CTS | RTS | RX | TX |

CONNECTION TO SEPARATE PRINTER

In case this option is available, you will have a 4-pins female connector.
The connection has been installed as follows:

| Indicator function | 4-pins female connector |
|--------------------|-------------------------|
| TX | pin nr 3 |
| CTS | pin nr 4 |
| GND | pin nr 2 |

CONNECTION PC (OPTION)

In case this option is available, you will have a 4-pins female connector.
The connection has been installed as follows:

| Indicator function | 4-pins female connector |
|--------------------|-------------------------|
| TX | pin nr 3 |
| RX | pin nr 4 |
| GND | pin nr 2 |

In case a connecting cable is delivered, this will be configured as follows:

| 4-pins male cable part | colour | 9 pins female PC function sub D connector | |
|------------------------|--------|--|-----|
| TX | white | pin nr 2 | RX |
| RX | brown | pin nr 3 | TX |
| GND | yellow | pin nr 5 | GND |

PC PROTOCOL BIDIRECTIONAL (2100NUpgrade).

With parameter 25 the data protocol for the comport may be set.

If parameter 25 is set to “2”, the PC bi-directional command structure is active.

The protocol commands are ASCII commands.

| ASCII command | Response string | operation |
|-----------------------------|-----------------------|-------------------------------------|
| SZ<CR> * ₁ | OK<CR>/ERR<CR> | Set zero value |
| RZ<CR> | OK<CR>/ERR<CR> | Reset zero value |
| | | |
| SP<value><CR>* ₂ | OK<CR>/ERR<CR> | Set preset tare value |
| ST<CR> * ₁ | OK<CR>/ERR<CR> | Set tare |
| SG<CR> | G+0001.0<CR> | Set gross mode (continuously) |
| SN<CR> | N+0001.0<CR> | Set net mode (continuously) |
| SW<CR> | W+00010+000103805<CR> | Set weights mode (continuously) |
| | | |
| RT<CR> | OK<CR>/ERR<CR> | Reset tare |
| RP<CR> | OK<CR> | Reset preset tare |
| | | |
| | | |
| GP<CR> | P+0001.0<CR> | Get preset tare |
| GT<CR> | T+0001.0<CR> | Get tare |
| GG<CR> | G+0001.0<CR> | Get gross |
| GN<CR> | N+0001.0<CR> | Get net |
| GW<CR> | W+00010+000103805<CR> | Get net, gross, status and checksum |
| | | |
| MN<CR> | N+0001.0<CR> | Get net, wait for no motion |
| MG<CR> | G+0001.0<CR> | Get gross, wait for no motion |
| | | |

*1: With the indicator 2100 these commands are the same. Only the number of divisions out of zero determines whether the weight is tared out (>2% of full scale) or zeroed out (<=2% of full scale)

*2: If the scale is working in ranges with a number after the decimal point, the preset tare value should be given in accordingly. If the scale is working in ranges equal to or higher than 1 kg/lb, then the value should be entered with the decimal point at the end of the value.

E.g. ranges 0.1/0.2/0.5 >> P0001.5<CR>, ranges 1/2/5/10/20/50 >> P00150.<CR>

Special commands 'GW' and 'SW'

The 'GW' and 'SW' are commands with checksums. With these commands it is possible to get net, gross and status data. The response string doesn't have the decimal point information. The 'SW' update rate is the time as the other commands (max. 2x/second).

Structure of the response string:

| | | | | | |
|---------|-----------|-------------|-------------|----------|---------------|
| W | +00010 | +00010 | 38 | 05 | <CR> |
| Data ID | Net value | Gross value | Status(hex) | Checksum | End of string |

Status bits:

| Bit number | Bit definition | Status '0' | Status '1' |
|------------|----------------------------|------------------------|------------------------|
| 7 (MSB) | Indicator error | No errors | Indicator error |
| 6 | Tare active | No tare active | Tare active |
| 5 | Zero corrected | No zero correction | Zero corrected |
| 4 | Weight stable | Weight unstable | Weight stable |
| 3 | Within negative zero range | Out of neg. zero range | Within neg. zero range |
| 2 | Above max load | Under max load | Above max load |
| 1 | Underload AD | No underload | underload |
| 0 (LSB) | Overload AD | No overload | overload |

Example:

38 (hex) = 0 0 1 1 1 0 0 0 (binair)

no overload
no underload
under maximum load
with in negative zero range
weight is stable
zero corrected
no tare active
no errors

Calculating the checksum:

The checksum is the inverted sum of all ASCII characters in the response string previous to the checksum.

Example:

Response string = W+00010+000103805<CR>

1. Add all hex values of the characters in the string.
[W][+][0][0][0][1][0][+][0][0][0][1][0][+][3][8]
Total is 2FA(hex)
2. Remove the most significant digit, result is FA(hex)
3. Invert the hexadecimal value, result is 05(hex)
4. Convert the hexadecimal value to characters, result is [0][5]

REMOTE DISPLAY PROTOCOL (2100NUpgrade).

The indicator 2100 offers the possibility to communicate one-directional with a remote display, PC or other host device.

In remote display mode a data string is send out continuously.

Whatever mode is indicated on the indicator will also be send out through the comport. In 'Gross' mode the string will contain the gross weight, in 'Net' mode the string will contain the net weight.

With parameter 25 the data protocol for the comport may be set.

If parameter 25 is set to "0", the Remote Display command structure is active.

The protocol commands are ASCII commands.

Data string:

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|------|-----------------------|-----------------------|-----------|-----------|-----------|---|---------------|
| +/- | 0 | 0 | 0 | 0 | 0 | . | <CR> |
| Sign | 1 st digit | 2 nd digit | 3rd digit | 4th digit | 5th digit | Decimal point position depending of range | End of string |

NOTE: In cases of error messages the indicator sends out the equal sign (= ascii value 61) and a <CR>.

Examples:

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | Condition on display indicator |
|---|---|---|---|---|---|---|----|------------------------------------|
| + | 0 | 0 | 2 | 5 | . | 0 | CR | Weight displayed of 25.0 kg(lb) |
| - | 0 | 1 | 3 | 0 | . | 5 | CR | Weight displayed of -130.5 kg(lb) |
| + | 0 | 0 | 0 | 0 | . | 0 | CR | Weight displayed of 0.0 kg(lb) |
| = | = | = | = | = | = | = | CR | Error message displayed e.g. HELP1 |

2100N PC PROTOCOL

With parameter P24 the data protocol for the comport may be set.

If parameter 24 is set to "1", 2100N PC (continuous) command structure is active.

If the weighing system is connected to a PC or a terminal, the following RS 232 ASCII protocol is valid.

Baudrate: 9600 baud (in case of an old application 1200 baud)
 Databits: 8 bits
 Stopbits: 1 stopbit
 Parity: none

The continuous datastring is built as follows:

| | Data ID | Weighing value | Status | Checksum | End character |
|------------|----------------|-----------------------|---------------|-----------------|----------------------|
| | W | +00123. | 38 | 05 | <CR> |
| | W | +0012.3 | 38 | 05 | <CR> |
| ASCII nr 1 | | 2,3,4,5,6,7,8 | 9,10 | 11,12 | 13 |

- The decimal indication in the weight has ASCII value 046.
- The end character <CR> has ASCII value 013.
- The starting character has ASCII value 087.
- The total length of the datastring always is 13 ASCII characters.

The status is built from 2 ASCII characters. The right-hand character indicates the status of bit (0 until 3) +30h. The left-hand character indicates the status of bit (4 until 7) +30h. The statusbits have following meanings:

| | | |
|----------------------------|---------------------|------------------|
| Bit nr 7. Net < 20e | 1=on | 0=off |
| Bit nr 6. PT | 1=on | 0=off |
| Bit nr 5. Incline | 1=on | 0=off |
| Bit nr 4. Motion detection | 1=motion | 0=stable |
| Bit nr 3. Zero | 1=within +/- 2% | 0=outside +/-2% |
| Bit nr 2. Overload (9e) | 1=max +9e HELP1 | 0=within max +9e |
| Bit nr 1. Overload (A/D) | 1=+signal>max HELP7 | 0=+signal<max |
| Bit nr 0. Underload(A/D) | 1=-signal>min HELP3 | 0=-signal<min |

Bit nr 0 and 1 high HELP2 taring under gross zero

Bit nr 0 and 2 high HELP4 PT value larger than MAX1

Bit nr 0 and 1 and 2 high LOW BAT

Bit 0 until 3 + 30hex shows the right-hand ASCII character in the status word.

Bit 4 until 7 + 30hex shows the left-hand ASCII character in the status word.

Example:

The system is loaded with 250 kg of which 50 kg has been tared out. The weight is stable and the weighing system is positioned horizontally. The indicator indicates that the battery needs to be loaded. The following bits are high in this case: 0,1,2,3 and 7. This is in binary 1000 1111. In hexadecimal this becomes 8 and F. 30 hex added, gives 38 and 3 F. These are the ascii characters 8 and ?. When the battery is reloaded, the status, in similar weighing conditions, will be as follows: Binary > 1000 1000; hexadecimal > 8 and 8; ascii characters 8 and 8.

The check sum is compiled as follows:

The first 10 ASCII values are added without carry in a byte. Of this the inverse value with error FFh is taken. Then the value is divided in a high and low nibble. Following 30h is added, which results in the 2 ASCII characters.

Example:

The first ten ascii characters of the emitted datastring are: [W + 00544.17]. The sum of the hexa-values then is:
 $57+2B+30+30+35+34+34+2E=31+37=215$. The least significant number is emitted (2) after which the inverse is taken: E and A. 30 hex added, gives the ascii characters: > and: . The final string thus is as follows: [W+00544.17>:]

Via PC or terminal following commands can be generated:

- | | |
|-----------|---|
| Z<CR> | Command for zero setting (system <2% loaded) or for tare (system >2% belast) of the weighing system. |
| P00010.<C | Sets a preset tare value (PT) in the weighing system. |
| R> | The place of the decimal depends on the smallest graduation. If the graduation has a decimal after de dot, this should also be don in the P command. Is the |
| or | |
| P0001.0<C | number value incorerct, no action is taken. This can be identified by statusbit |
| R> | nr 6 (stays off). If necessary clear the previous PT if it is still present. |
| R<CR> | This command releases the PT. Resets HELP2 and HELP4. |
| T<CR> | Activates the preset tare present in the indicator. |