

1 Data Output Formats

1.1 Serial interface

1.1.1 Output formats of weight data

According to the format No. 1, 2, 3, 4, 5, 6, 7, or 8 selected in the interface configuration the string is designed as follows:



Note: In special cases customized formats are possible.

Format 1: (STX)...(ETX) with package name

The string consists of 22 characters.

Start	Package name	Weight	Unit	End
(STX)	XXXXXXXXXX	XXXXXXX	XXX	(ETX)

Field	Description
Start (STX)	1 character: (Hex)02
Package name	10 characters, left justified
Weight	7 characters, number of the decimal place according to the configuration (0, 1, 2 or 3), no decimal point with 0 decimal places, right justified with leading blanks
Unit	3 characters, left justified (g/kg/oz/lb)
End (ETX)	1 character, (Hex)03

Example: (STX)COFFEE-----500.00g--(ETX)

Format 2: (STX)...(ETX) without package name

The string consists of 12 characters.

Start	Weight	Unit	End
(STX)	XXXXXXX	XXX	(ETX)

Field	Description
Start (STX)	1 character: (Hex)02
Weight	7 characters, number of the decimal place according to the configuration (0, 1, 2 or 3), no decimal point with 0 decimal places, right justified with leading blanks
Unit	3 characters, left justified (g/kg/oz/lb)
End (ETX)	1 character, (Hex)03

Example: (STX)---0.512kg--(ETX)

Format 3: (CR)(LF) with package name

The string consists of 22 characters.

Package name	Weight	Unit	End
XXXXXXXXXX	XXXXXXX	XXX	(CR)(LF)

Field	Description
Package name	10 characters, left justified
Weight	7 characters, number of the decimal place according to the configuration (0, 1, 2 or 3), no decimal point with 0 decimal places, right justified with leading blanks
Unit	3 characters, left justified (g/kg/oz/lb)
End (CR)(LF)	2 characters, (Hex)0D, 0A

Example: COFFEE1.2g(CR)(LF)

Format 4: (CR)(LF) without package name

The string consists of 12 characters.

Weight	Unit	End
XXXXXXX	XXX	(CR)(LF)

Field	Description
Weight	7 characters, number of the decimal place according to the configuration (0, 1, 2 or 3), no decimal point with 0 decimal places, right justified with leading blanks
Unit	3 characters, left justified (g/kg/oz/lb)
End (CR)(LF)	2 characters, (Hex)0D, 0A

Example: 50g(CR)(LF)



Note: Data output formats 5-8 include the weight zone. The zone is characterized as follows:

- OK** is the zone of "accepted" (i.e. "good") products)
 - is the first (inner) zone of underweights
 - is the first (inner) zone of overweights
 - with five zones: second (outer) zone of underweights
 - ++ with five zones: second (outer) zone of overweights

Format 5: (STX)...(ETX) with package name and classification

The string consists of 24 characters.

Start	Package name	Weight	Unit	Zone	End
(STX)	XXXXXXXXXX	XXXXXXX	XXX	XX	(ETX)

Field	Description
Start (STX)	1 character: (Hex)02
Package name	10 characters, left justified
Weight	7 characters, number of the decimal place according to the configuration (0, 1, 2 or 3), no decimal point with 0 decimal places, right justified with leading blanks
Unit	3 characters, left justified (g/kg/oz/lb)
Zone	2 characters, right justified with leading blanks (OK, -, +, --, ++)
End (ETX)	1 character, (Hex)03

Example: (STX)COFFEE-----500.00g--OK(ETX)

Format 6: (STX)...(ETX) without package name and classification

The string consists of 14 characters.

Start	Weight	Unit	Zone	End
(STX)	XXXXXXX	XXX	XX	(ETX)

Field	Description
Start (STX)	1 character: (Hex)02
Weight	7 characters, number of the decimal place according to the configuration (0, 1, 2 or 3), no decimal point with 0 decimal places, right justified with leading blanks
Unit	3 characters, left justified (g/kg/oz/lb)
Zone	2 characters, right justified with leading blanks (OK, -, +, --, ++)
End (ETX)	1 character, (Hex)03

Example: (STX)---0.512g---+(ETX)

Format 7: (CR)(LF) with package name and classification

The string consists of 24 characters.

Package name	Weight	Unit	Zone	End
XXXXXXXXXX	XXXXXXX	XXX	XX	(CR)(LF)

Field	Description
Package name	10 characters, left justified
Weight	7 characters, number of the decimal place according to the configuration (0, 1, 2 or 3), no decimal point with 0 decimal places, right justified with leading blanks
Unit	3 characters, left justified (g/kg/oz/lb)
Zone	2 characters, right justified with leading blanks (OK, -, +, --, ++)
End (CR)(LF)	2 characters, (Hex)0D, 0A

Example: COFFEE~~~~~1.2g~~~(CR)(LF)

Format 8: (CR)(LF) without package name and classification

The string consists of 14 characters.

Weight	Unit	Zone	End
XXXXXXX	XXX	XX	(CR)(LF)

Field	Description
Start (STX)	1 character: (Hex)02
Weight	7 characters, number of the decimal place according to the configuration (0, 1, 2 or 3), no decimal point with 0 decimal places, right justified with leading blanks
Unit	3 characters, left justified (g/kg/oz/lb)
Zone	2 characters, right justified with leading blanks (OK, -, +, --, ++)
End (CR)(LF)	2 characters, (Hex)0D, 0A

Example: ~~~~~50g~~~+(CR)(LF)

1.1.2 Data Output Formats In Case Of Multi-Line Weighing

When the checkweigher is designed as a "dual track" weigher or has even more than two lanes for weighing, the number of the production line is included as "line No." (1 or 2 or ...) in the data string to ensure clear allocation of the weight values to the production line they origin from. Thus the string becomes 1 character longer. This "special string length" can only be modified by service.

Format 1: (STX)...(ETX) with No. and package name

The string consists of 23 characters.

Start	Line	Package name	Weight	Unit	End
(STX)	X	XXXXXXXXXXXX	XXXXXXXX	XXX	(ETX)

Field	Description
Start (STX)	1 character: (Hex)02
Line	"Line No." (1 character)
Package name	10 characters, left justified
Weight	7 characters, number of the decimal place according to the configuration (0, 1, 2 or 3), no decimal point with 0 decimal places, right justified with leading blanks
Unit	3 characters, left justified (g/kg/oz/lb)
End (ETX)	1 character, (Hex)03

Example: (STX)2COFFEE-----500.00g--(ETX)

Format 2: (STX)...(ETX) with No. and without package name

The string consists of 13 characters.

Start	Line	Weight	Unit	End
(STX)	X	XXXXXXX	XXX	(ETX)

Field	Description
Start (STX)	1 character: (Hex)02
Line	"Line No." (1 character)
Weight	7 characters, number of the decimal place according to the configuration (0, 1, 2 or 3), no decimal point with 0 decimal places, right justified with leading blanks
Unit	3 characters, left justified (g/kg/oz/lb)
End (ETX)	1 character, (Hex)03

Example: (STX)2--0.512kg--(ETX)

Format 3: (CR)(LF) with No. and package name

The string consists of 23 characters.

Start	Line	Package name	Weight	Unit	End
(STX)	X	XXXXXXXXXXXX	XXXXXXXX	XXX	(CR)(LF)

Field	Description
Start (STX)	1 character: (Hex)02
Line	"Line No." (1 character)
Package name	10 characters, left justified
Weight	7 characters, number of the decimal place according to the configuration (0, 1, 2 or 3), no decimal point with 0 decimal places, right justified with leading blanks
Unit	3 characters, left justified (g/kg/oz/lb)
End (CR)(LF)	2 characters, (Hex)0D, 0A

Example: 2COFFEE1.2g(CR)(LF)

Format 4: (CR)(LF) with No. and without package name

The string consists of 13 characters.

Line	Weight	Unit	End
X	XXXXXXX	XXX	(CR)(LF)

Field	Description
Start (STX)	1 character: (Hex)02
Line	"Line No." (1 character)
Weight	7 characters, number of the decimal place according to the configuration (0, 1, 2 or 3), no decimal point with 0 decimal places, right justified with leading blanks
Unit	3 characters, left justified (g/kg/oz/lb)
End (CR)(LF)	2 characters, (Hex)0D, 0A

Example: 250g(CR)(LF)

1.2 Data Communication Via The Ethernet Interface

Due to the connection of the checkweigher to the intranet, several possibilities are now available for transmitting data to the checkweigher via the intranet or for requesting data from the checkweigher via the intranet.

There are some pre-defined applications that use the Ethernet port – above all, Freeweigh. Net, HI-SPEED LogInServer and HI-SPEED CW-ReAcTII. For these applications, certain parameters must be entered at the checkweigher only once. For applications which mean that the delivered data must be further processed, for example weight data or GARECO.Net, the general operation principle of data transmission by means of Ethernet and TCP/IP must have been understood.

1.2.1 Basics of TCP/IP

Already in the 1960s, the American military placed an order to create a protocol that should allow for a standardized communication, irrespective of the hardware and software used, between any number of different networks. From this requirement specification, the protocol TCP/IP arose in the year 1974. Even though TCP and IPS are always mentioned together in one word, they are two protocols one of which works on top of the other. The Internet Protocol IP ensures the right addressing technique and delivery of the data packets while the Transport Control Protocol TCP which is on top of it is responsible for the transfer and protection of the data.

IP addresses

Under IP each network subscriber has an unique internet address, which is often referred to as "IP number". This internet address is a 32-bit value that is always transmitted by four decimal numbers separated by decimal points (8-bit values) for better legibility (dot notation). The internet address consists of Net ID and Host ID, with the Net ID serving for addressing of the network and the Host ID serving for the addressing of the network subscriber within a network.

The network administrator is free to choose the assignment of the Host ID to the network subscriber and thus the resulting IP address. Ensure that an IP address will be assigned only one at a time.

TCP/IP Ethernet

TCP/IP is a purely logical protocol and always requires a physical basis. Today, Ethernet has the biggest popularity among the physical network topologies, and so one finds Ethernet as physical basis in most TCP/IP networks.

TCP – Transport Control Protocol

As IP is an unsecured, connectionless protocol, it normally works together with the TCP on top of it, the latter ensuring the protection and the handling of the useful data. TCP establishes a connection between two Network subscribers for the duration of the data transmission. During the establishing of the connection, conditions will be determined – for example the size of the data packets – which

are applied to the connection during the entire connection duration. One can compare TCP with a telephone connection as an example. Subscriber A dials to subscriber B; subscriber B accepts the connection by picking up the handset, the connection then remains until one of the two subscribers finishes it by hanging up.

TCP works according to the client-server principle:

The network subscriber who builds a connection (i. e. the subscriber who takes the initiative) is called "the client". The client makes use of a service offered by the server, with – depending on the service – one server being capable of serving several clients simultaneously. The network subscriber to which the connection is made is called "the server". A server does nothing actively but waits for a client to establish a connection to it. In TCP context, these two are referred to as TCP client and TCP server.

Establishing and cancelling of a TCP connection

TCP has fixed mechanisms for establishing a connection between client and server. Among others, the establishing of a connection is used to synchronize both subscribers in accordance with the data flow to be transferred, and to exchange transfer parameters such as the package length and receive-memory capacity.

Flow controls

TCP has several mechanisms to ensure the certain and efficient transfer of data:

- The sender must maintain all data i.e. keep them available until they are confirmed (acknowledged) by the recipient.
- In case of faulty packages, for example data packages with a wrong checksum, the recipient returns the last acknowledgement number to the sender, whereupon the sender repeats the data package.
- In case of lost packages the sender repeats all packages, after a timeout has ended, after the acknowledgement received last.

Port numbers

TCP also forwards the useful data on the target computer to the right user program, by contacting different user programs – also referred to as "services" – via different port numbers. All port numbers from 0 to 1023 are occupied by standardized services.

The following table shows a selection of the most popular applications.

Port	Name	Application/Service
21	FTP	File Transfer
23	TELNET	Terminal over Network
25	SMTP	Simple Mail Transfer
53	DOMAIN	Domain Name Service
80	HTTP	Hypertext Transfer
115	SFTP	Simple File Transfer