98647-002-02

Sartorius YDO01BL

Description of the Interface for Sartorius Basic^{lite} Balances and Gold Scales

sartorius

Contents

Applications

The YDO01BL interface can operated with the following balances/scales:

- BJ models
- BL models
- GM models

Intended Use

Installation of the YDO01BL interface provides the balance/scale with an interface port that can be connected to a computer (or other peripheral device).

With this interface, you can use a computer to change, start and monitor balance/scale functions and applications.

Available Features

Type of interface: Serial interface

Operating mode: Full duplex

Standard: RS-232

Transmission rates:
150, 300, 600, 1200, 2400, 4800, 9600 baud

Parity: Mark, space, odd, even

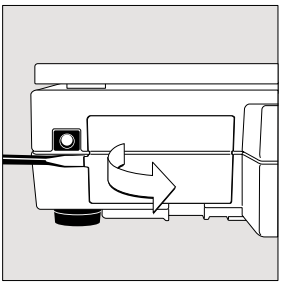
Character format:
Start bit, 7-bit ASCII, parity, 1 or 2 stop bits

Handshake:
2-wire interface: via software (XON/XOFF)
4-wire interface: via hardware (CTS/DTR)

Protocol: SBI

Data output format of the balance/scale:
16 or 22 characters

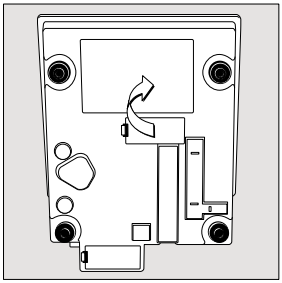
Installation



- Disconnect the balance/scale from AC power: Unplug the AC adapter from the wall outlet (mains supply)
- Remove weighing pan

Open the balance/scale housing:

- Remove the plate from the back of the scale/balance

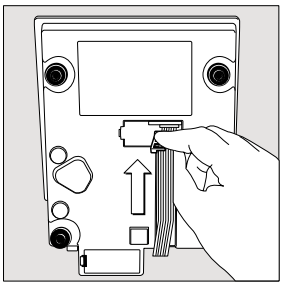


- Lay the balance/scale on its side

⚠ Do not turn the balance/scale over (on the weighing pan), as this could damage the weighing system

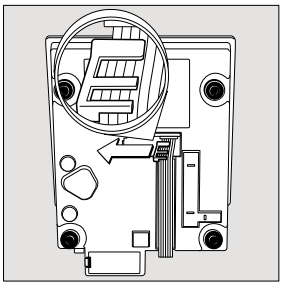
- Remove the plate from the bottom of the balance/scale

⚠ Do not remove the plate on models of type BL...-0CE, GM...-0CE

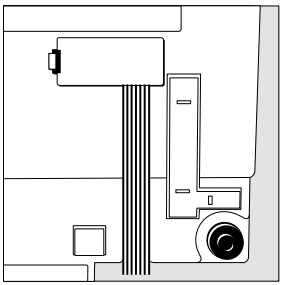


- Plug the flat cable into the balance/ scale PCB

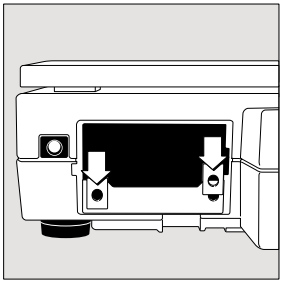
⚠ The flat cable is pre-assembled on models of type BL...-0CE, GM...-0CE



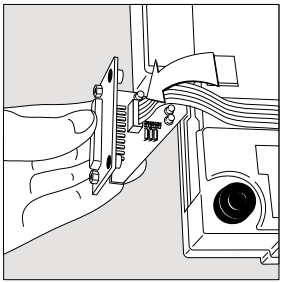
- Remove the cable holder



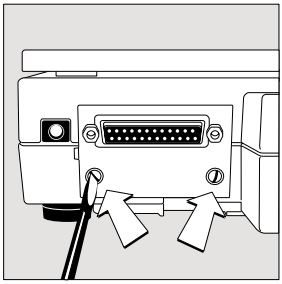
- Remove the protective plastic from the double-sided adhesive tape
- Affix the flat cable to the balance/scale housing
- Replace the plate on the bottom of the housing



- Use the 2 screws supplied to fasten the interface port in the position made available by removing the plate (flat surface facing outward)



- Plug the flat cable into the PCB of the interface

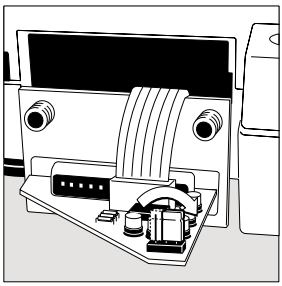


- Use the enclosed 2 screws and washers to fasten the interface to the balance/scale

Automatic Power-on

Purpose

To have the balance/scale switch on automatically after a power outage, after the power plug has been inserted or unplugged, or after I/⏻ is pressed. When this setting is configured, the balance/scale can not be turned off by pressing I/⏻.



Settings

- Left jumper: "Automatic Power-on" function is switched off (factory setting)
- Right jumper: "Automatic Power-on" function is switched on

Preparation

- Change the position of the jumper on the interface

Configuring the Interface

Parameter Settings (Menu)

Purpose

To configure the balance/scale and the interface; i.e., to adapt the equipment to user requirements by selecting parameters from the options available in the balance/scale operating menu.

If the balance/scale is verified for use in legal metrology, the parameters that are not permissible are not displayed.

Factory Settings

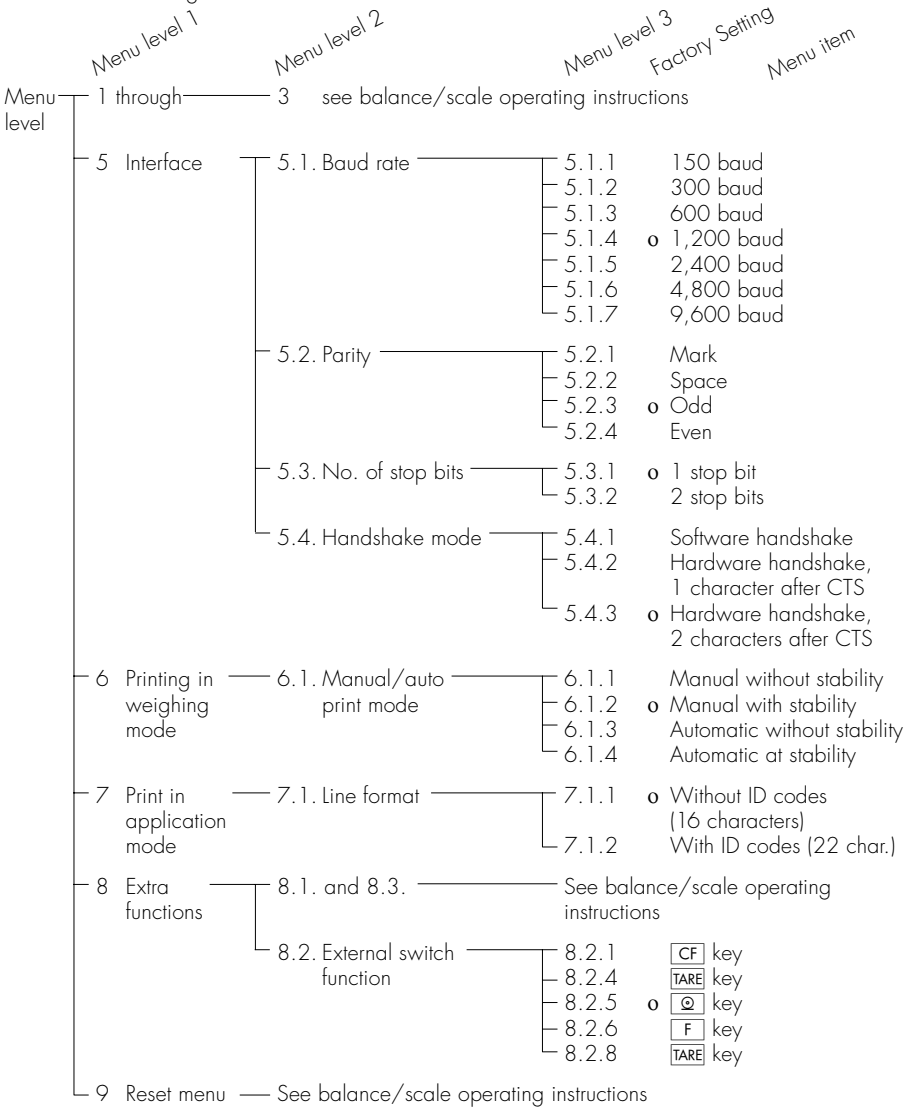
The factory-set parameters are marked by an "o" in the following parameter list (see the next page).

Preparation and Examples

○ See the balance/scale installation and operating instructions

Parameter Options for the Interface Port (Overview)

o Factory setting
√ User-defined setting



Data Output Functions

Printing a Data Record

Purpose

You can generate a printout of weights as well as other measured values and IDs for documentation purposes. You can format the printout to meet individual requirements.

Available Features

Print individual values

Line format: You can configure a data ID code of up to 6 characters for each of the values printed; this data ID code is printed at the beginning of a line.

Printouts are generated automatically or by pressing [⊙], depending on or regardless of the balance/scale stability parameter.

You can have the following values output automatically when using the application programs if menu code 7.1.2 is configured (printout with data ID codes):

- Second tare memory: last net value
- Counting: Reference weight for one piece (average piece weight)
- Weighing in percent: Reference weight for the percentage selected
- Averaging: Result of measurement

Examples of Data Records

Printout without Data ID Codes (Menu Code 7.1.1):

The value currently displayed is printed (weight or calculated value with unit)	`+ 1530.0 g`	Weight in grams
	`+ 58.562 ozt`	Weight in Troy ounces
	`+ 253 pcs`	Piece count
	`+ 88.2 %`	Percentage
	`+ 105.8 o`	Calculated value

Printout with Data ID Codes (Menu Code 7.1.2):

The current value displayed can also be printed with a data ID code of up to 6 characters at the beginning of a line. You can use this data ID code, e.g., to designate a weight readout as a net weight (N) or a calculated value as a piece count (Qnt)

N + 153.0 g	Current net weight
N1 + 153.0 g	Current net weight (with data in 2nd tare memory)
T1 + 10.2 g	Value in 2nd tare memory
Qnt + 253 pcs	Calculated quantity (piece count)
Prc + 88.2 %	Calculated percentage
Res + 153.0 g	Calculated result

Print Application Parameters (Menu Code 7.1.2):

You can generate a printout of one or more of the values configured for initialization of an application as soon as you initialize the balance/scale.

wRef + 1.4 g	Counting: average piece weight
Wxx% + 120.0 g	Weighing in percent: reference weight for the selected percentage

Auto Print (Menu Code 6.1.3 or 6.1.4):

You can have the weight readout printed automatically. The display update interval depends on the operating status and model of the balance/scale.

N + 153.0 g	Net weight
Stat	Display blank
Stat L	Display underload
Stat H	Display overload

Interface Description

Factory Settings:

Transmission rate: 1,200 baud (5. 1. 4)

Parity: Odd (5. 2. 3)

Stop bits: 1 stop bit (5. 3. 1)

Handshake: Hardware, 1 character after CTS (5. 4. 3)

Protocol: Standard SBI (5. 5. 1)

Print manually/automatically:
Manual after stability (6. 1. 2)

Data Output Format (Line Format)

You can output the values displayed in the measured value line and the weight unit with or without a data ID code.

Example: Without data ID code

```
+      253 pcs
```

Example: With data ID code

```
Qnt    +      253 pcs
```

Configure this parameter in the Setup menu (Menu: Printout format 7.1.1 or 7.1.2).

The output without a data ID code has 16 characters; with a data ID code, 22 characters.

⚠ Note on Operation of the Balance/Scale with the YDP03-0CE Printer

- When data output with 22 characters per line is configured (menu code 7. 2. 2), the "GLP/GMP printout" setting in the printer must be set to "off" (-A1- 0 = off)

Output Format With 16 Characters

Display segments that are not activated are output as spaces.
Characters without a decimal point are output without a decimal point.

The following characters can be output, depending on the characters displayed on the balance/scale:

Normal Operation

Position	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	+	*	D	D	D	D	D	D	D	D	*	U	U	U	CR	LF
or	–		.	.	.	.	.	.	.	.		*	*	*		
or	*		*	*	*	*	*	*	*	*						
or					0	0	0	0	0	0						

*: Space
D: Digit or displayed character
U: Unit symbol
CR: Carriage return
LF: Line feed'

Special Codes

Position	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	*	*	*	*	*	*	–	–	*	*	*	*	*	*	CR	LF
or							H	*								
or							L	*								

*: Space
– –: Final readout mode (readout has not yet stabilized)
H: Overload
L: Underload

Error Code

Position	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	*	*	*	U	*	*	*	#	#	#	*	*	*	*	CR	LF

*: Space
#: Error code number

Example: Data output example: + 1255.7 g

Position	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	+	*	*	*	1	2	5	5	.	7	*	g	*	*	CR	LF

Position 1: Plus or minus sign or space
Position 2: Space
Positions 3–10: Weight with a decimal point; leading zeros = space
Position 11: Space
Positions 12–14: Unit symbol or space
Position 15: Carriage return
Position 16: Line feed

Output Format with 22 Characters

When data with an ID code is output, the ID code consisting of 6 characters precedes the data with the 16-character format. These 6 characters identify the following value.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
I	I	I	I	I	I	+	*	D	D	D	D	D	D	D	D	*	U	U	U	CR	LF
	*	*	*	*	*	–		.	.	.	.	.	.	.	.		*	*	*		
						*		*	*	*	*	*	*	*	*						
										0	0	0	0	0	0						

I: ID code character
*: Space
D: Digit or letter
U: Unit symbol
CR: Carriage return
LF: Line feed

Special Codes

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
S	t	a	t	*	*	*	*	*	*	*	*	–	–	*	*	*	*	*	*	CR	LF
												H	*								
												L	*								

*: Space
– –: Final readout mode (readout has not yet stabilized)
H: Overload
L: Underload

Error Codes

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
S	t	a	t	*	*	*	*	*	E	r	r	*	#	#	#	*	*	*	*	CR	LF

*: Space
#: Error code number

ID code characters (I)	Meaning
Stat	Status
N	Net N
N1	Net N1
Qnt	Counting: quantity (piece count)
Prc	Weighing in percent: percentage
Res	Calculation, averaging: result
wRef	Automatic printout: average piece weight
Wxx%	Automatic printout: reference percentage weight

Data Input Format

You can connect a computer to your balance/scale to send commands via the balance/scale interface port to control balance/scale functions and applications.

A control command can have up to 4 characters. Each character must be transmitted according to the settings configured in the Setup menu for data transmission.

Format for Control Commands

Format :	Esc	!	CR	LF

Esc: Escape CR: Carriage return (optional)
!: Command char. LF: Line feed (optional)

Command character !	Meaning
K	Weighing mode 1
L	Weighing mode 2
M	Weighing mode 3
N	Weighing mode 4
O	Block keys
P	Print
R	Release keys
S	Restart
T	Tare and zero (combined)
U	Tare ("Tare only")
V	Zero ("Zero")
W	External calibration/adjustment

Synchronization

During data communication between the balance/scale and an on-line device (computer), messages consisting of ASCII characters are transmitted via the interface. For error-free data communication, the parameters for baud rate, parity, handshake mode and character format must be the same for both units.

You can set these parameters in the Setup menu so that they match those of the on-line device. You can also define parameters in the balance/scale to make data output dependent on various conditions. The conditions that can be configured are described for each of the application programs.

If you do not plug a peripheral device into the balance/scale interface port, this will not generate an error message.

Handshake

The balance/scale interface (Sartorius Balance Interface = SBI) has transmit and receive buffers. You can define the handshake parameter in the Setup menu:

- Hardware handshake (CTS/DTR)
- Software handshake (XON, XOFF)

Hardware Handshake

With a 4-wire interface, 1 more character can be transmitted after CTS (Clear to Send).

Software Handshake

The software handshake is controlled via XON and XOFF. When a device is switched on, XON must be transmitted to enable any connected device to communicate.

Activating Data Output

You can define the data output parameter so that output is activated either when a print command is received, or automatically and synchronously with the balance/scale display (see application program descriptions and auto-print setting).

Data Output by Print Command

The print command can be transmitted by pressing [⊙] or by a software command (Esc P).

Automatic Data Output

In the "auto print" operating mode, data are output to the interface port without a print command. You can choose to have data output automatically at defined print intervals with or without the stability parameter. Whichever parameter you select, the data will be output as the readouts appear on the balance/scale display. The display update frequency depends on the setting for "Adapting the Filter" (code 1.1.x.).

If you select the auto print setting, data will be transmitted immediately the moment you turn on the balance/scale.

Pin Assignment Chart

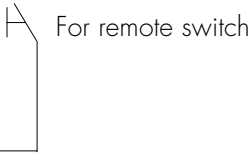
Female Interface Connector:
25-position D-Submini, DB25S, with screw lock hardware for cable gland

Male Connector Used: (please use connectors with the same specifications):
25-pin D-Submini, DB25S, with integrated shielded cable clamp assembly (Amp type 826 985-1C) and fastening screws (Amp type 164 868-1)

⚠ Warning When Using Pre-wired RS-232 Connecting Cables!
RS-232 cables purchased from other manufacturers often have incorrect pin assignments for use with Sartorius balances/scales. Be sure to check the pin assignment against the chart below before connecting the cable, and disconnect any lines marked "Internally Connected" (e.g., pin 6).
Failure to do so may damage or even completely ruin your balance/scale and/or peripheral device.

Pin Assignment Chart:

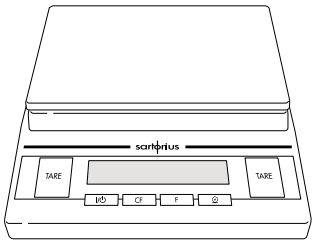
Pin 1:	Signal Ground
Pin 2:	Data Output (TxD)
Pin 3:	Data Input (RxD)
Pin 4:	Internal Ground (GND)
Pin 5:	Clear to Send (CTS)
Pin 6:	Not Connected
Pin 7:	Internal Ground (GND)
Pin 8:	Internal Ground (GND)
Pin 9:	Not Connected
Pin 10:	Not Connected
Pin 11:	Power Supply Input (Battery) +12 ... +20 V (I _ out 25mA)
Pin 12:	Reset _ Out *)
Pin 13:	+ 5V Output
Pin 14:	Internal Ground (GND)
Pin 15:	Universal Remote Control Switch
Pin 16:	Not Connected
Pin 17:	Not Connected
Pin 18:	Not Connected
Pin 19:	Not Connected
Pin 20:	Data Terminal Ready (DTR)
Pin 21:	Internal Ground (GND)
Pin 22:	Not Connected
Pin 23:	Not Connected
Pin 24:	Not Connected
Pin 25:	+ 5V Output



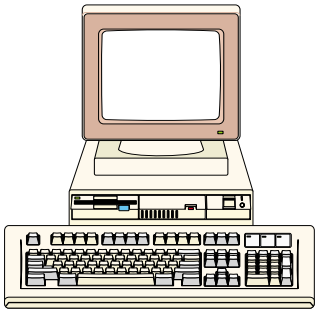
*) = Hardware restart

Cabling Diagram

Diagram for interfacing a computer or different peripheral device to the balance/scale using the RS-232/V24 standard and cables up to 15 m (~ 50 ft.) long

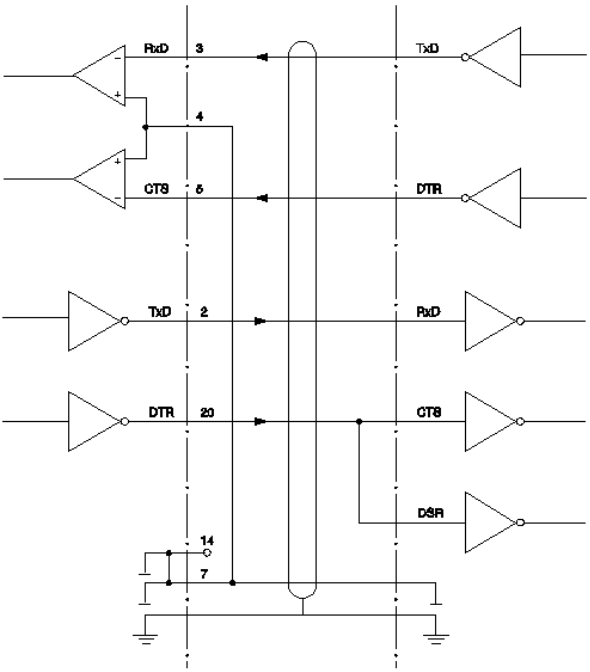


V24



Peripheral Device

Balance/Scale



PC	
25-pin	9-pin
2	3
20	4
3	2
5	8
6	6
7	5

Type of cable: AWG 24 specification

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