User Manual

SmartConnect™ Cables

Wiring and Cable Configuration for cables with loose ends

METTLER TOLEDO

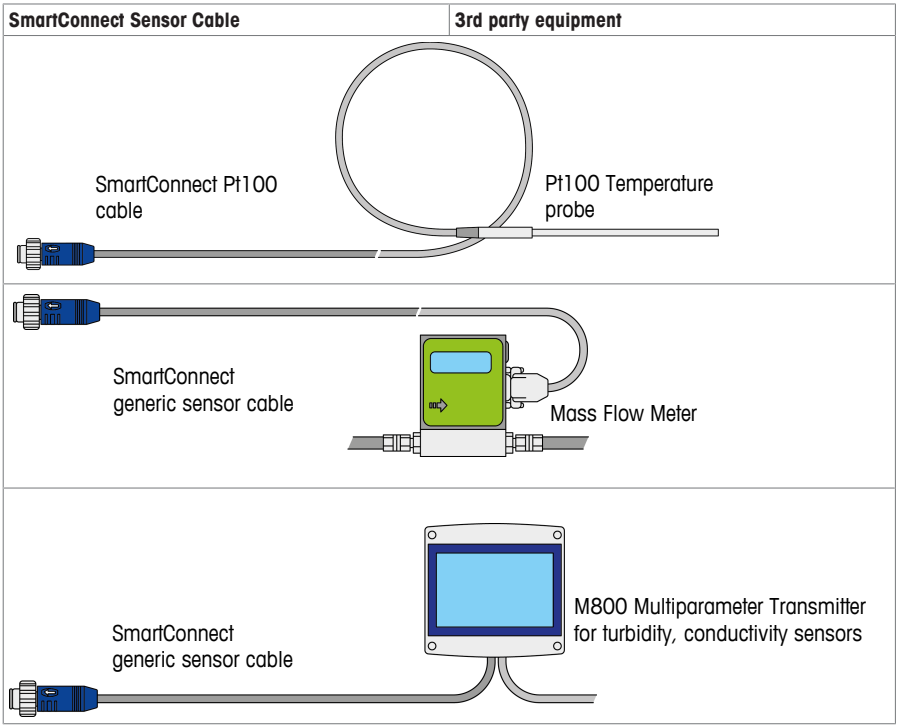
1 Introduction

This is a step-by-step guide explaining how to connect SmartConnect™ cables to the target sensor or final control elements (on touchscreen actuator), configuring the cable with adjustment data and using the sensor or final control elements (actuator) on the touchscreen user interface. The SmartConnect cables have an integrated chip which stores data and sensor/final control elements information e.g. signal type.

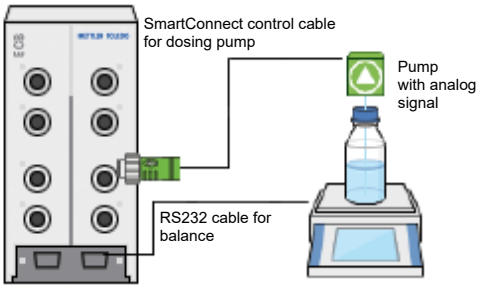
This guide is suitable for the following SmartConnect cables:

Order No.	Description	Supported signal types	No. of wires
30267163	SmartConnect Pt100 cable with loose ends	Pt100	5
30267165	SmartConnect generic sensor cable with loose ends	Pt100, Current, Voltage	9
30267164	SmartConnect control cable with loose ends	Current, Voltage, Frequency, PWM, TTL	13

SmartConnect cables provide plug & play capabilities to existing 3rd party equipment available in the lab. The following picture shows examples on possible setups:



Example of dosing pump use



2 Safety Measures

The wiring described in this documentation is only to be carried out by trained personnel.

⚠ CAUTION

Usage

- Operate the product only with standard and optional equipment documented by METTLER TOLEDO.
- This document must be read and understood. If the product is not used according to this document, protection of the instrument may be impaired and METTLER TOLEDO assumes no liability.
- The electrical connectors are not resistant to corrosive gases. Take appropriate measures and/or place the product in a suitable place in the lab or outside of the fume hood.

⚠ CAUTION

Non-insulated stranded wires

The non-insulated stranded wires can impair the product. Do separately insulate all stranded wires which are not used for the connection.

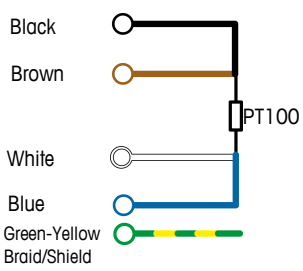
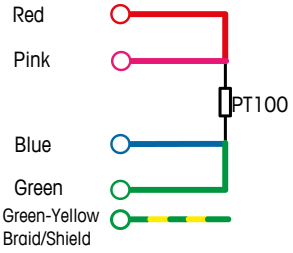
3 Wiring to connect sensors or final control elements

3.1 Wiring to connect a Pt100 temperature probe

NOTICE

Wiring of Pt100 probe

Determine appropriate wiring of any pt100 sensor by measuring resistance [ohm] over its circuit points. To be carried out by trained personnel.

SmartConnect Pt100 cable **Part no. 30267163**	**SmartConnect generic sensor cable** **Part no. 30267165**
	

3.2 Wiring to connect a current sensor or signal transmitter (cable part no: 30267165)

Color	**Function**	**2-wire mA** Transmitter is fed via a 2 wire current loop	**Direct mA** Transmitter is fed by an external power supply
White	24 V supply	mA In	
Brown	Current+	mA Out	mA In
Green	Analog GND	(bridged)	
Yellow	Current-		mA out
Grey	Power GND		
Pink	Volt+		
Blue	Volt-		
Red	ICon (I constant)		
Green-Yellow	Braid/Shield		

For the 2-wire mA connection, bridge the green and yellow cable.

3.3 Wiring to connect a voltage sensor or signal transmitter (cable part no: 30267165)

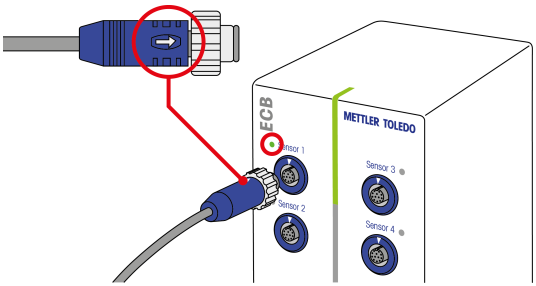
Color	**Function**	**4-wire Volt** Transmitter is fed via the sensor port through two separate lines	**Direct Volt**
White	24 V supply	Supply+	
Brown	Current+		
Green	Analog GND		
Yellow	Current-		
Grey	Power GND	Supply-	
Pink	Volt+	Volt+	Volt+
Blue	Volt-	Volt-	Volt-
Red	ICon (I constant)		
Green-Yellow	Braid/Shield		

3.4 Wiring to connect final control elements (cable part no: 30267164)

Color	**Function**	**Current (mA)**	**Voltage (V)**	**Pulse width modulation**	**Frequency**	**Syringe pump (via TTL)**
White	24 V Supply	24 V, 0.7 A				
Brown	Power GND	Power GND				
Green	Volt +		V +			
Yellow	Current +	mA +				
Grey	Analog GND	mA -	V -			
Pink	FOUT (Frequency output)				Fout	Footswitch (momentary)
Blue	TTL in (Transistor to transistor logic)					Run indicator
Red (light)	not used					
Orange	Valve			24 V Valve		
Tyrian purple	TXD (Transmit Data)					
Black	RXD (Receive Data)					
Violet	Digital GND				GND	GND
Yellow-green	Braid/ shield					

4 Connecting cable to SmartConnect port

There are dedicated ports for sensors (blue) and final control elements (green).



Note If you have loose ends cables, please refer to the SmartConnect cables User manual to get instructions on the correct setup.

- Make sure the color of the cable plug corresponds with the color of the port.

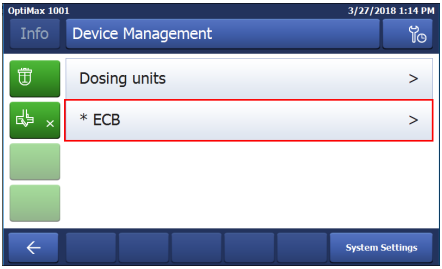
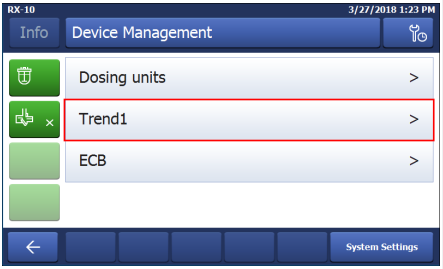
1 To fit the plug into the socket, the arrow on the plug needs to be at the top.

2 Turn the front part of the plug until the connection is tight.

3 The status LED (only available on ECB) turns green once the sensor or final control element is ready to use.

5 Entering configuration screen of SmartConnect cables

Upon first connection of the SmartConnect cable, the cable chip needs to be configured in order to use the cable properly. The cable configuration screen can be entered as follows:

Configuration on ECB	Configuration on RX-10 (sensors only)
1. Tap on main screen. 2. Tap on *ECB.	1. Tap on main screen. 2. Tap on second button e.g. Trend1.
	
3. Select the ECB. 4. Tap on the ECB SmartConnect port where the sensor or actor is connected.	

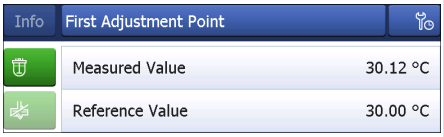
5.1 Configure a SmartConnect Pt100 sensor cable (part no: 30267163)

1 Set a **Trend Name** (max. 15 characters). This name will be used on the main screen and in the trend viewer.

2 Set sensor limits. A warning is shown if limits are violated.

3 Tap **Adjust Sensor** to perform an adjustment.

– Enter the actual temperature in the "Reference Value" field. The system then stores the offset on the cable chip (0.12 K in this case).



5.2 Configure a SmartConnect generic sensor cable (part no: 30267165)

1 Select a channel according to your sensor.

2 Set a **Device Name.** It will later appear in reports generated by iControl.

3 Set a **Trend Name** (max. 15 characters). This name will be used on the main screen and in the trend viewer.

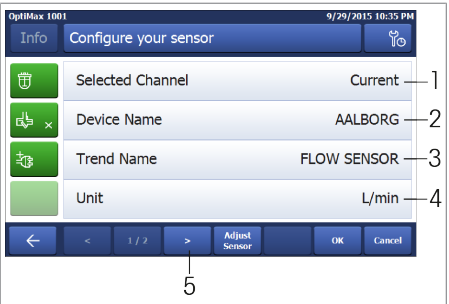
4 Set a **Unit** matching your sensor.

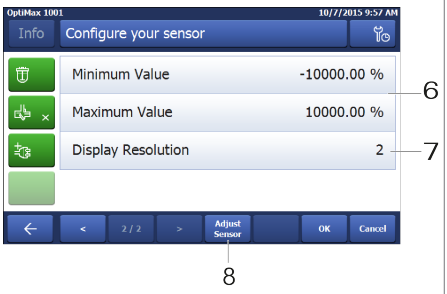
5 Go to next page.

6 Set sensor limits. A warning is shown if limits are violated

7 Select a **Display Resolution**. This setting defines the number of decimal places shown for this sensor.

8 Tap **Adjust Sensor** to perform an adjustment.





– A 2-point offline adjustment can be performed for voltage/current sensors. Enter the value in the "Reference Value" field for both adjustment points.

5.3 Configure a SmartConnect control cable (part no: 30267164)

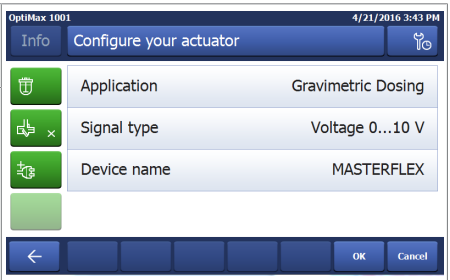
1 Select the application for the cable
   ⇨ Gravimetric Dosing: dosing with pump and balance.

2 Select signal type to control pump as specified in data sheet of vendor
- Voltage 0 … 10 V
- Current 0 … 20 mA
- Current 4 … 20 mA
- PWM: 0…100% duty cycle at 24V
- Frequency: 120 strokes/min
- Frequency: 180 strokes/min

3 Set a Device Name
   ⇨ It will later appear in reports generated by iControl.

4 Press OK to save the configuration to the cable.

⇨ The connected pump can be used for dosing

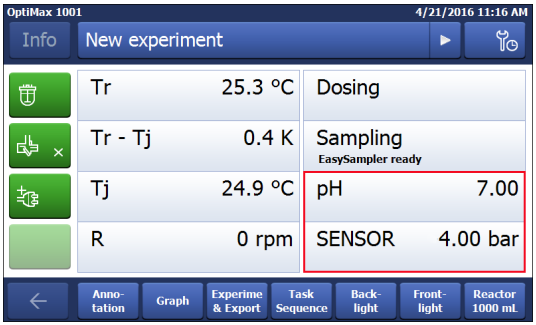


6 Displaying sensor values

If there is an empty user-customizable field on the main screen the SmartConnect sensors will automatically appear.

If not proceed as follows:

1 Tap on one of the user-customizable fields (marked red) on the main screen.



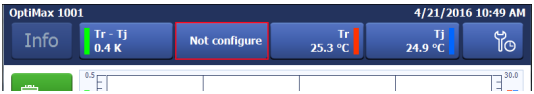
2 Tap on desired sensor value.

⇨ The sensor value is shown on the main screen.

7 Displaying sensor or dosing trend

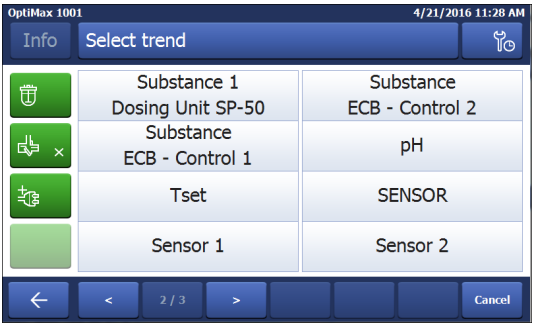
1 Tap on **Graph** on the main screen.

2 Tap a trend value at the top of the screen you want to replace e.g. Not configured.



3 Tap on **Shown trend.**

⇨ A list with possible values is displayed:



4 Tap on the sensor or dosing trend you want to display e.g. Substance (ECB - Control 1)

5 Change color if needed.

6 Tap **Apply**.

⇨ The graph is shown in the trend viewer.

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