Quick Setup Guide
Transmitter M100

Content

1	Introduction	2
2	Installation	3
3	HART System Architecture	4
4	Terminal Block (TB) Definitions	6
5	Menu Structure	7
6	General Setup	8
7	Sensor Calibration	10

1 Introduction

Note: The Quick Setup Guide is a brief operating instruction.

The M100 transmitter must only be installed, connected, commissioned, and maintained by qualified specialists e.g. electrical technicians in full compliance with the instructions in this Quick Setup Guide, the applicable norms and legal regulations. The specialist must have read and understood this Quick Setup Guide and must follow the instructions it contains. If you are unclear on anything in this Quick Setup Guide, you must read the Operation Manual (supplied on CD-ROM).
The Operation Manual provides detailed information on the device.

The M100 transmitter should be operated only by personnel familiar with the transmitter and who are qualified for such work.

Intended Use
The M100 is a 2-wire head mount transmitter for analytical measurements with HART communication capabilities. The M100 is a single-channel, multi-parameter unit for pH/ORP, conductivity and dissolved oxygen measurement. It is only compatible with ISM sensors.
The M100 transmitter is designed for use in the process industries and is certified intrinsically safe for installations in hazardous areas.

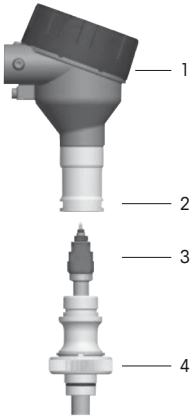
M100 parameter fit guide

Parameter	**M100 2XH**
	ISM
pH/ORP	•
pH/pNa	•
Conductivity 4-e	•
Amp. DO ppm/ppb/trace	•

2 Installation

Note: Power off device during installation.

1. Install sensor housing as desribed in the operation manual of the sensor housing.
2. Carefully insert sensor into the sensor housing. Screw in sensor hand-tight.
3. Screw sensor housing and extension tube hand-tight. Do not turn the M100 transmitter. Turn extension tube only.
4. Unscrew cover of the M100 transmitter.
5. Perform wiring. See "Terminal Block (TB) Definitions" chapter on Page 6.
6. Screw cover of the transmitter M100.



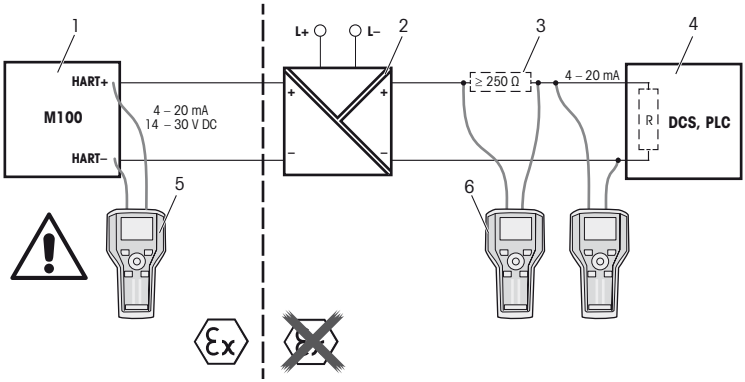
1 M100 transmitter
2 Extention tube
3 Sensor or electrode
4 Sensor housing

3 HART System Architecture

You configure the M100 transmitter either via a configuration tool, an asset-management-tool or via a HART handheld terminal. The DD and the DTM files are on the supplied CD-ROM or can be downloaded via Internet "www.mt.com/M100".

For further information see "General Setup" chapter on Page 8.

HART® connection with HART handheld terminal



1 M100 transmitter

2 Repeater power supply, preferably HART transparent

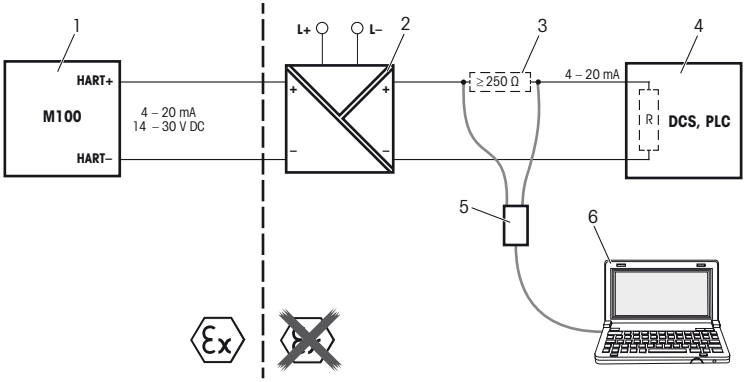
3 Load resistor, is not required if one is installed in the repeater power suppy

4 DCS (Distributed control system) or PLC (Programmable logic controller)

5 HART handheld terminal, directly connected to the device even in the Ex i-area

6 HART handheld terminal e.g. 475 FieldCommunicator from Emerson

HART® connection with HART modem and configuration tool



1 M100 transmitter

2 Repeater power supply, preferably HART transparent

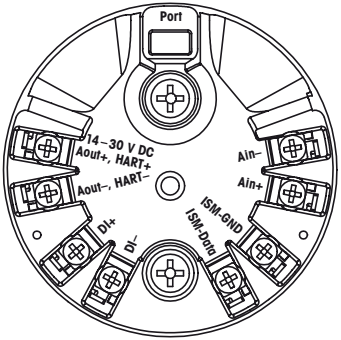
3 Load resistor, is not required if one is installed in the repeater power suppy

4 DCS (Distributed control system) or PLC (Programmable logic controller)

5 HART modem

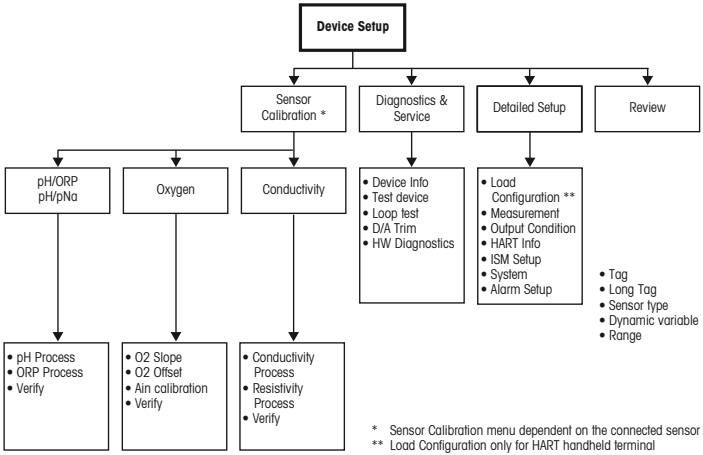
6 PC with configuration tool, e.g. PACTWare™ from Pepperl+Fuchs
PACTWare™ is on supplied CD-ROM or available as freeware.

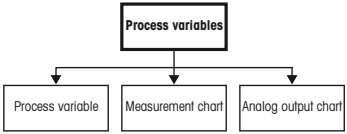
4 Terminal Block (TB) Definitions



Terminal	Definition
Port	Interface for service e.g. firmware update
Aout+, HART+ Aout–, HART–	**Notice polarity.** Power connection: 14 to 30 V DC Analog output HART signal
DI+	Digital input: 0.0 to 1.0 V DC inactive, 2.3 to 30.0 V DC active
DI–	
ISM-DATA	Sensor input, see "Introduction" chapter on Page 2. Wired by factory. Do not disconnect.
ISM-GND	
Ain+	Analog input: 4 to 20 mA for pressure compensation
Ain–	

5 Menu Structure





6 General Setup

You configure the M100 transmitter either via a configuration tool, an asset-management-tool or via a HART handheld terminal.

Prerequisite: The M100 transmitter and the sensor are mounted and electrically connected.

Configuration tool or asset-management tool

Note: The DTM and the configuration tool PACTWare™ are on the supplied CD-ROM. You can also download the DTM via Internet "www.mt.com/M100".

For steps 1 to 5 refer to the documentation about the tool.

1. Install configuration tool e.g. PACTWare™ or asset-management-tool.
2. Install DTM for HART interface and DTM for M100 transmitter.
3. Update device catalog.
4. Build up connection. Check COM port settings if necessary.
5. Set **Tag** or/and **Long tag**.
   Menu path: Device Setup > Detailed Setup > HART Info
6. Set **Date** and **Time**. Set the time in the 24 hour format. The time format cannot be changed. Menu path: Device Setup > Detailed Setup > System
7. Set range of the analog output signal.
   Menu path: Detailed setup > Output Condition > Analog output > Range
   - **URV** (Upper range value) and **LRV** (Lower range value), can be changed to the current measurement range
   - **USV** (Upper range sensor) and **LSV** (Lower range sensor), defined by the sensor and cannot be changed
8. Define the process variables **PV**, **SV**, **TV** and **QV**
   Menu path: Device Setup > Detailed Setup > Measurements > Channel Setup

9. Calibrate sensor. Menu path: Device Setup > Sensor Calibration
10. Perform further settings. See manual of the M100 transmitter.
11. Store configuration to device.

HART handheld terminal

Note: The DD "008E8E7D0101.hhd" is on the supplied CD-ROM. You can also download the DD via Internet "www.mt.com/M100".

For step 1 refer to the documentation about the HART handheld terminal.

1. Check if the DD of the M100 transmitter has already been installed on the HART handheld terminal. Install the DD if necessary.
2. The communication is built up automatically.
3. Load configuration from device. Menu path: Device Setup > Detailed Setup
4. Set **Tag** or/and **Long tag**.
   Menu path: Device Setup > Detailed Setup > HART Info
5. Set **Date** and **Time**. Set the time in the 24 hour format. The time format cannot be changed. Menu path: Device Setup > Detailed Setup > System
6. Set range of the analog output signal.
   Menu path: Detailed setup > Output Condition > Analog output > Range
   - **URV** (Upper range value) and **LRV** (Lower range value), can be changed to the current measurement range
   - **USV** (Upper range sensor) and **LSV** (Lower range sensor), defined by the sensor and cannot be changed
7. Define the process variables **PV**, **SV**, **TV** and **QV**
   Menu path: Device Setup > Detailed Setup > Measurements > Channel Setup
8. Calibrate sensor. Menu path: Device Setup > Sensor Calibration
9. Perform further settings. See manual of the M100 transmitter.

7 Sensor Calibration

(PATH: Device setup/Sensor Calibration)

Note: For best process calibration results observe the following points. Take grab sample as close as possible to the measurement point of the sensor. Measure the sample at process temperature.

Note: Via configuration tool, asset-management-tool or HART handheld terminal you can calibrate the sensor with the "Process calibration" method. For other calibration methods use iSense software.

Note: As soon the calibration is in progress no other calibration can be started.

Sensor Calibration Menu

For the calibration methods see "Menu Structure" chapter on Page 7.

After every successful calibration the following options are available:

Adjust
Calibration values are adopted and used for the measurement. Additionally, the calibration values are stored in the calibration history.

Calibrate
Calibration values are stored in the calibration history for documentation, but not be used for the measurement. The calibration values from the last valid adjustment are further used for the measurement.

Abort
Calibration values are discarded.

iSense™

For calibrating the sensor in the lab or in non-hazardous areas you can use iSense. The scope of delivery comprises the iSense software on CD-ROM and the iSense cable.

Perform sensor calibration via configuration tool or asset-management tool

1. Select **Sensor Calibration** menu.
2. Select calibration method.
3. For O_2 calibration select calibration unit.
4. Click **[Step 1: Capture current measured value]**.
5. The current **Sensor value** and **Status** are shown.
6. Click **[Next]** to store the measured value.
7. The following message appears "Captured value is stored. Take a grab sample to measure in the lab or perform parallel measurement." Click **[OK]**.
8. Click **[Step 2: Enter reference value]**. You can perform Step 2 at any time.
9. The captured value of "Step 1" is shown.
10. Enter the measured reference value.
11. Click **[Next]** to store the reference value.
12. If the reference value is within the valid range, the **Slope** and **Offset** are shown. Click **[OK]**.
13. The following message appears "Complete calibration procedure. Select either "Adjust", "Calibrate" or "Abort".
14. Select **Adjust**, **Calibrate** or **Abort**. Click **[OK]**.

Perform sensor calibration via HART handheld terminal

1. Select **Sensor Calibration** menu.
2. Select calibration method.
3. For O2 calibration select calibration unit.
4. The following message is shown "Capture current measured value".
5. Press **[OK]** to store the current measured value.
6. The following message appears "Captured value is stored. Take a grab sample to measure in the lab or perform parallel measurement." Press **[OK]**.
7. The following message is shown "Enter reference value". You can perform this step at any time. Press **[OK]**.
8. The captured value is shown.
9. Enter the measured reference value.
10. Press **[OK]** to store the reference value.
11. If the reference value is within the valid range, the **Slope** and **Offset** are shown. Press **[OK]**.
12. Select **Adjust**, **Calibrate** or **Abort**. Press **[OK]**.

Perform calibration for current input Ain

For O_2 measurement you can connect an external pressure sensor for pressure compensation. The pressure sensor is connected to **Ain** terminals.

To improve the accuracy of the O_2 measurement we recommend to calibrate the current input **Ain**.

1. Connect reference meter to **Ain** terminals.
2. Select **Sensor Calibration** menu.
3. Select **Ain Calibration** calibration method.
4. The following message appears "Set output to 4 mA". Click **[OK]**.
5. The old value for the 4 mA value is shown. Enter the new reference value measured with the reference meter.
6. Click **[OK]** to store the new reference value for 4 mA.
7. **Reference value**, **Sensor value** and **Status** are shown. Click **[Next]**.
8. The following message appears "Set output to 20 mA". Click **[OK]**.
9. The old value for the 20 mA value is shown. Enter the new reference value measured with the reference meter.
10. Click **[OK]** to store the new reference value for 20 mA.
11. **Reference value**, **Sensor value** and **Status** are shown. Click **[Next]**.
12. The following message appears "Complete calibration procedure. Select either "Adjust", "Calibrate" or "Abort".
13. Select **Adjust**, **Calibrate** or **Abort**. Click **[OK]**.

メトラー・トレド株式会社
プロセス機器事業部
〒110-0008
東京都台東区池之端2-9-7
池之端日殖ビル1F
Tel: +81-3-5815-5512
Fax: +81-3-5815-5522
E-mail: helpdesk.ing.jp@mt.com

Mettler-Toledo AG
Process Analytics
Im Hackacker 15
CH-8902 Urdorf (スイス)
電話: +41 44 729 62 11
ファックス: +41 44 729 66 36
www.mt.com/pro

Mettler-Toledo Thornton, Inc.
900 Middlesex Turnpike, Bldg. 8
Billerica, MA 01821 (アメリカ合衆国)
電話: +1 781 301 8600
通話料無料: +1 800 642 4418
ファックス: +1 781 271 0214
www.mt.com/thornton

МЕТТЛЕР ТОЛЕДО СНГ
101000 Россия, Москва,
Сретенский бульвар, 6/1, офис 6
Тел. (495) 651-98-86, 621-92-11
Факс: (495) 621-63-53, 621-78-68
E-mail: inforus@mt.com
Интернет: www.mtrus.com

Mettler-Toledo AG
Process Analytics
Im Hackacker 15
CH-8902 Urdorf (Швейцария)
Тел. +41 44 729 62 11
Факс: +41 44 729 66 36
www.mt.com/pro

Mettler-Toledo Thornton, Inc.
900 Middlesex Turnpike, Bldg. 8
Billerica, MA 01821 (США)
Тел. +1 781 301 8600
Бесплатная +1 800 642 4418
Факс: +1 781 271 0214
www.mt.com/thornton

梅特勒-托利多
METTLER TOLEDO
实验室/过程检测/产品检测设备
地址：上海市桂平路 589 号
邮编：200233
电话：021-64850435
传真：021-64853351
E-mail: ad@mt.com

Mettler-Toledo AG
Process Analytics
Im Hackacker 15
CH-8902 Urdorf (瑞士)
电话：+41 44 729 62 11
传真：+41 44 729 66 36
www.mt.com/pro

Mettler-Toledo Thornton, Inc.
900 Middlesex Turnpike, Bldg. 8
Billerica, MA 01821 (美国)
电话：+1 781 301 8600
免费电话：+1 800 642 4418
传真：+1 781 271 0214
www.mt.com/thornton

메틀러 토레도 코리아㈜
서울시 서초구
양재동 124-5
에일빌딩 1-3층 137-130
전화: 1588-0180
팩스: 02-3498-3555
이메일: helpdesk.korea@mt.com

Mettler-Toledo AG
Process Analytics
Im Hackacker 15
CH-8902 Urdorf (스위스)
전화: +41 44 729 62 11
팩스: +41 44 729 66 36
www.mt.com/pro

Mettler-Toledo Thornton, Inc.
900 Middlesex Turnpike, Bldg. 8
Billerica, MA 01821 (미국)
전화: +1 781 301 8600
무료 전화: +1 800 642 4418
팩스: +1 781 271 0214
www.mt.com/thornton

A Mettler-Toledo Ges.m.b.H., Südrandstrasse 17, A-1230 Wien
Phone +43 1 604 19 80, Fax +43 1 604 28 80

BR Mettler-Toledo Ind. e Com. Ltda., Avenida Tamboré, 418, Tamboré, BR-06460-000 Barueri/SP
Phone +55 11 4166 7400, Fax +55 11 4166 7401

CH Mettler-Toledo (Schweiz) GmbH, Im Langacher, Postfach, CH-8606 Greifensee
Phone +41 44 944 45 45, Fax +41 44 944 45 10

D Mettler-Toledo GmbH, Prozeßanalytik, Ockerweg 3, D-35396 Gießen
Phone +49 641 507 333, Fax +49 641 507 397

E Mettler-Toledo S.A.E., C / Miguel Hernández, 69-71, ES-08908 L'Hospitalet de Llobregat (Barcelona)
Phone +34 902 32 00 23, Fax +34 902 32 00 24

F Mettler-Toledo, Analyse Industrielle S.A.S., 30, Boulevard Douaumont, F-75017 Paris
Phone +33 1 47 37 06 00, Fax +33 1 47 37 46 26

J Mettler-Toledo K.K., Process Division, 6F Ikenohata Nisshoku Bldg., 2-9-7, Ikenohata, Taito-ku
JP-110-0008 Tokyo. Phone +81 3 5815 5606, Fax +81 3 5815 5626

CN Mettler-Toledo Instruments (Shanghai) Co. Ltd., 589 Gui Ping Road, Cao He Jing
CN-200233 Shanghai. Phone +86 21 64 85 04 35, Fax +86 21 64 85 33 51

UK Mettler-Toledo LTD, 64 Boston Road, Beaumont Leys, GB-Leicester LE4 1AW
Phone +44 116 235 7070, Fax +44 116 236 5500

USA METTLER TOLEDO, Process Analytics, 900 Middlesex Turnpike, Bldg. 8, Billerica, MA 01821, USA
Phone +1 781 301 8800, Fax +1 781 271 0681

Mettler-Toledo AG
Process Analytics
Im Hackacker 15
CH-8902 Urdorf, Switzerland
Phone +41 44 729 62 11
Fax +41 44 729 66 36
www.mt.com/pro

Mettler-Toledo Thornton, Inc.
900 Middlesex Turnpike, Bldg. 8
Billerica, MA 01821, USA
Phone +1 781 301 8600
Freephone +1 800 642 4418
Fax +1 781 271 0214
www.mt.com/thornton

Printed in Switzerland. 30 130 606