



# Measurement System & Calibration

Just as a manufacturing process may have variations and defects, the process of measuring and obtaining data may also have variation. The right kinds of gauges need to be selected and used correctly. Many people assume that measurement is accurate as long as the gauge is calibrated. In reality even calibrated measurement systems can provide wrong readings due to excessive variations due to other factors.

This hands-on competency based training that complements the theoretical knowledge with practical exercises.

## Administrative Details

Date	: <b>October 25 - 26, 2021 (Mon - Tue)</b>
Time	: <b>Day 1 (9:00 am – 5:00 pm)</b> <b>Day 2 (9:00 pm – 5:00 pm)</b>
Platform	: <b>ZOOM</b>
Fees	: <b>RM 1,007.00 (FMM Member)</b> <b>RM 1,113.00 (Non member)</b> <i>The fee inclusive Service Tax at 6%</i>
Contact	: <b>Pn. Astri (<a href="mailto:astri@fmm.org.my">astri@fmm.org.my</a>)</b>
Persons & Email	: <b>En. Omar (<a href="mailto:omar@fmm.org.my">omar@fmm.org.my</a>)</b> <b>Ms. Jessica (<a href="mailto:jessica@fmm.org.my">jessica@fmm.org.my</a>)</b>
Closing Date	: <b>October 15, 2021</b>
SBL Code	: <b>10001104603</b>
Training Provider	: <b>FMM Institute Johor</b> <b>MYCOID: 475427W_JOHOR</b>

### COURSE CONTENTS

#### 1. Understanding the Measurement System

- ✓ Gauge (measuring instrument)
- ✓ Measurement System & Process
- ✓ Standard and Hierarchy of Standards
- ✓ Resolution, Accuracy & Bias
- ✓ Repeatability and Reproducibility
- ✓ Stability & Linearity

#### 2. Choosing a measuring instrument

- ✓ Resolution and accuracy
- ✓ Accuracy ratio
- ✓ Exercise: Choose the right gauge
- ✓ How to check your gauge?

#### 3. Calibration

- ✓ Why calibrate?
- ✓ What is calibration?
- ✓ Traceability in calibration
- ✓ Checking calibration certificates
- ✓ Calibration stickers
- ✓ Calibration intervals
- ✓ Recalibration
- ✓ How to manage calibration?
  - Calibration master list
  - Calibration responsibility
  - Internal and external calibration
- ✓ Exercise: Designing a calibration system

#### 4. Gauge Repeatability & Reproducibility (GR&R) Study

- ✓ Sources of measurement variation
- ✓ Meaning of Repeatability
- ✓ Meaning of Reproducibility
- ✓ GRR study
- ✓ Acceptable GRR
- ✓ Methods of GR&R study
  - ANOVA method
  - AIAG method
- ✓ Exercise: Calculate GRR

#### 5. Handling of measuring instruments

- ✓ Identification of gauges
- ✓ Proper handling
- ✓ Safeguarding gauges
  - Storage
  - Record keeping
  - Training of personnel

#### 6. Discussion session

#### 7. Competency evaluation

- ✓ Written test

### OBJECTIVE

- ✓ Explain meanings of resolution, accuracy, bias, reproducibility, repeatability and hierarchy of standards as applied to a measurement system.
- ✓ Explain how to choose suitable measuring instruments for a given measurement
- ✓ Explain need for calibration
- ✓ Design a calibration system for their own department
- ✓ Perform GRR study
- ✓ Describe proper care of measuring instruments.



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## TARGET AUDIENCE

Calibration technicians, QA/QC personnel, Production, maintenance and engineering personnel

**FACILITATOR- Encik Muhsin Ahamed (I/c No. 610716-05-5073)** has been in the manufacturing industry for over 10 years, working his way up from Production Supervisor to Manufacturing Section Head to Human Resource Development Manager. A degree holder with a Bachelor of Science in Chemistry, Encik Muhsin also holds several diplomas and certificates in Management, Electronics Engineering, Computer Programming and Technology Based Training. As a Human Resource Development Manager, he has designed, developed and implemented various training programmes in Management, Supervisory, Quality Control and Manufacturing Technology. He has in-depth hands-on experience in various areas of manufacturing such as production, scheduling, planning and testing.

## Course Details

Date : **October 25 - 26, 2021 (Mon - Tue)**

Time : **9.00am - 5.00pm**

Venue : **Remote Online Training**

Platform: **Zoom**

SBL-Khas code no.: **10001104603**

### Fees

FMM Member : **RM 1,007.00 (FMM Member)**

**RM 1,113.00 (Others)**

The fee inclusive Service Tax at 6% (SST Number : W10-1901-32000105)  
( Fees include Certificate of Attendance)

Medium of Instruction : **English**

Closing Date : **October 15, 2021**

## Administrative Details

### Registration

- Upon Faxing/Mailing the completed Registration Form to FMM Institute, you are deemed to have read and accepted the terms and conditions. The course would also be deemed as confirmed unless informed otherwise.

### Payment

- Cheques made in favour of "FMM Institute" should be forwarded a week before the commencement of each programme.
- For SBL-Khas Scheme, an Attendance of 100% is a must, in any case, employers will be billed in full.

### Cancellation

- Must be in Writing with Reasons
- 7 days before the course – No payment charged
- 3 – 6 days before the course - 50% payment charged
- < 3 days before the course – Full payment charged
- Participants who did not turn-up will be charged full payment
- Replacements can be accepted at no additional cost

For further enquiries, please contact

### FMM Institute Johor Branch

**Pn. Astri / En. Omar / Ms. Jessica**

**Tel: 07-357 7613 / Fax: 07-357 7618**

**Email : astri@fmm.org.my / omar@fmm.org.my / jessica@fmm.org.my**

## REGISTRATION FORM

Dear Sir,

Please register the following participant(s) for the above programme

1 \*Name : \_\_\_\_\_

\*IC No. : \_\_\_\_\_

\*Designation : \_\_\_\_\_

\*Email : \_\_\_\_\_

2 \*Name : \_\_\_\_\_

\*Ic No. : \_\_\_\_\_

\*Designation : \_\_\_\_\_

\*Email : \_\_\_\_\_

### \* Required information

Submitted by:

Name : \_\_\_\_\_

Designation : \_\_\_\_\_

Company : \_\_\_\_\_

Address : \_\_\_\_\_

: \_\_\_\_\_

: \_\_\_\_\_

Tel & Fax No. : (T) \_\_\_\_\_ (F) \_\_\_\_\_

Email : \_\_\_\_\_

Please tick (✓) accordingly:

We will be claim under SBL-Khas Scheme and full payment would be made to FMM Institute in the event that no disbursement from HRDF under any circumstances

We will NOT BE CLAIMING Under SBL-Khas Scheme.

Enclosed cheque No. \_\_\_\_\_ for RM \_\_\_\_\_ being payment for \_\_\_\_\_ participant(s) made in favour of the "FMM Institute" should be forwarded to the Secretariat before **October 25, 2021**.