

PT. SENTRAL TEHNOLOGI MANAGEMEN

"To become the most trustworthy calibration laboratories in Indonesia"



SNI ISO/ IEC 17025

Laboratorium : Cikarang Square Blok B No 11, Jl. Raya Cibarusah Cikarang Selatan - Jawa Barat 17530 | Telp : (021) 89321323 - 4 | Fax : 29067204

SAL001

GW Instek

Digital Multimeter

GDM-8261A / GEN190885

SERTIFIKAT KALIBRASI **CALIBRATION CERTIFICATE**

Identitas Alat

Instrument's Details

Nomor Identifikasi

Identification Number

Nama

Name

Pabrik Manufacturer

Tipe / Nomor Seri

Type / Serial Number/ID

Nomor SO

SO number

Certificate number

Identitas Pemilik

Owner Details

Nama

Name

Alamat

Address

Nomor Sertifikat

PT. SENTRAL TEHNOLOGI MANAJEMEN

Cikarang Square Blok B, Jalan Raya Cikarang Cibarusah No.11, Sukaresmi, Cikarang Selatan, Pasirsari, Cikarang Sel., Bekasi, Jawa Barat 17530

Cikarang,

30 September 2020

: 10/14/0-1200/143

Disetujui oleh

Approved by

SENTRAL SISTEM PT. Sentral Tehnologi Managemen

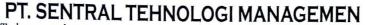
Rudi Eko Suryono

Manajemen Teknis



1 of 8







"To become the most trustworthy calibration laboratories in Indonesia"

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Tanggal Terima

: 25 September 2020

: 25 September 2020

Nomor SO

Date of acceptance

SO number

Tanggal Kalibrasi

Calibration date

Nomor Sertifikat

Certificate number

Tempat Kalibrasi

: PT. SENTRAL TEHNOLOGI MANAGEMEN

: 10/140-1200/143

Calibration place

Temperature

Kondisi Lingkungan Environment condition

: Suhu : (24.4 ± 0.6) °C

Kelembaban Humidity

: $(60 \pm 1)\%$ rh

HASIL KALIBRASI

Result of Calibration

Range	Standard Nominal	inst. Reading	Correction	Uncertainty	
100 mV	0.0000 mV	-0.0007 mV	0.0007 mV	0.0053 mV	
	10.0000 mV	9.9998 mV	0.0002 mV	0.0053 mV	
	20.0000 mV	20.0010 mV	-0.0010 mV	0.0053 mV	
	50.0000 mV	50.0043 mV	-0.0043 mV	0.0053 mV	
	80.0000 mV	80.0079 mV	-0.0079 mV	0.0059 mV	
	90.0000 mV	90.0089 mV	-0.0089 mV	0.0062 mV	
	-10.0000 mV	-10.0020 mV	0.0020 mV	0.0053 mV	
	-50.0000 mV	-50.0084 mV	0.0084 mV	0.0053 mV	
	-90.0000 mV	-90.0141 mV	0.0141 mV	0.0062 mV	
1 V	0.1000000 V	0.099995 V	0.000005 V	0.000007 V	
	0.900000 V	0.899959 V	0.000041 V	0.000032 V	6
	-0.900000 V	-0.899969 V	-0.000031 V	0.000032 V	
10 V	1.000000 V	0.99999 V	0.00001 V	0.00004 V	
	3.00000 V	2.99997 V	0.00003 V	0.00015 V	
	5.00000 V	4.99997 V	0.00003 V	0.00020 V	
	7.00000 V	6.99994 V	0.00006 V	0.00026 V	
	9.00000 V	8.99994 V	0.00006 V	0.00032 V	
	-1.000000 V	-0.99998 V	-0.00002 V	0.00004 V	
	-5.00000 V	-5.00003 V	0.00003 V	0.00020 V	
	-9.00000 V	-8.99999 V	-0.00001 V	0.00032 V	
100 V	10.00000 V	9.9996 V	0.0004 V	0.0004 V	
	90.0000 V	89.9969 V	0.0031 V	0.0032 V	
	-90.0000 V	-89.9976 V	-0.0024 V	0.0033 V	
1000 V	100.0000 V	99.991 V	0.009 V	0.004 V	
	200.0000 V	199.981 V	0.019 V	0.007 V	
	500.000 V	499.959 V	0.041 V	0.020 V	
	800.000 V	799.954 V	0.046 V	0.029 V	
	1000.000 V	999.952 V	0.048 V	0.035 V	
	-100.0000 V	-99.989 V	-0.011 V	0.004 V	
	-500.000 V	-499.973 V	-0.027 V	0.021 V	
	-1000.000 V	-999.960 V	-0.040 V	0.035 V	_







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Tanggal Terima

: 25 September 2020

Nomor SO

Date of acceptance Tanggal Kalibrasi

: 25 September 2020

SO number

: 10/140-1200/143

Calibration date

Nomor Sertifikat

Tempat Kalibrasi

: PT. SENTRAL TEHNOLOGI MANAGEMEN

Temperature

Certificate number

Calibration place

: Suhu

: (24.4 ± 0.6) °C

Kelembaban

Humidity

: $(60 \pm 1)\% \text{ rh}$

HASIL KALIBRASI Result of Calibration

Kondisi Lingkungan

Environment condition

Range	Standard Nominal	Inst. Reading	0		
100 µA	OC SHOOMS AND DESCRIPTION OF THE PROPERTY OF T		Correction	Uncertainty	k
100 μΑ	0.0000 μΑ	0.002 μΑ	-0.002 μA	0.049 µA	2.0
	10.0000 μΑ	10.002 μΑ	-0.002 μA	0.049 µA	2.0
	20.0000 μΑ	20.002 µA	-0.002 μA	0.049 µA	2.0
	50.0000 μΑ	50.009 μA	-0.009 µA	0.049 μΑ	2.0
	80.0000 μΑ	80.016 µA	-0.016 μA	0.049 μΑ	2.0
	90.0000 μA	90.020 µA	-0.020 μA	0.049 μΑ	2.0
	-10.0000 μA	-10.002 μA	0.002 μΑ	0.049 μΑ	2.0
	-50.0000 μA	-50.008 μA	0.008 μΑ	0.049 μΑ	2.0
	-90.0000 μA	-90.019 μA	0.019 µA	0.049 μΑ	2.0
1 mA	0.1000000 mA	0.100018 mA	-0.000018 mA	0.000049 mA	2.0
	0.900000 mA	0.90019 mA	-0.00019 mA	0.00012 mA	2.0
10 mA	1.000000 mA	1.00054 mA	-0.00054 mA	0.00013 mA	2.0
	9.00000 mA	9.00442 mA	-0.00442 mA	0.00075 mA	2.0
100 mA	10.00000 mA	10.0034 mA	-0.0034 mA	0.0008 mA	2.0
	90.0000 mA	90.032 mA	-0.032 mA	0.015 mA	2.0
	-90.0000 mA	-90.028 mA	0.028 mA	0.015 mA	2.0
1 A	0.100000 A	0.100026 A	-0.000026 A	0.000015 A	2.0
	0.900000 A	0.90029 A	-0.00029 A	0.00012 A	2.0
10 A	1.000000 A	1.00042 A	-0.00041 A	0.00021 A	2.0
	2.000000 A	2.00090 A	-0.00090 A	0.00024 A	2.0
	5.00000 A	5.0015 A	-0.0015 A	0.0021 A	2.0
	8.00000 A	8.0018 A	-0.0018 A	0.0032 A	2.0
	9.00000 A	9.0019 A	-0.0019 A	0.0035 A	2.0
	10.00000 A	10.0019 A	-0.0019 A	0.0069 A	2.0
	-1.000000 A	-1.00051 A	0.00051 A	0.00021 A	2.0
	-5.00000 A	-5.0015 A	0.0015 A	0.0021 A	2.0







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Tanggal Terima

: 25 September 2020

: 25 September 2020

Nomor SO

Date of acceptance

SO number

Tanggal Kalibrasi

Nomor Sertifikat Certificate number

Calibration date

: (24.4 ± 0.6) °C

Tempat Kalibrasi Calibration place

: PT. SENTRAL TEHNOLOGI MANAGEMEN

: 10/140-1200/143

Kondisi Lingkungan

: Suhu

Kelembaban Humidity

: $(60 \pm 1)\%$ rh

Environment condition Temperature

> HASIL KALIBRASI Result of Calibration

Parameter :	AC Vol		The second secon			
Range	Freq	Standard Nominal	Inst. Reading	Correction	Uncertainty	k
100 mV	50 Hz	0.000 mV	0.170 mV	-0.170 mV	0.051 mV	2.0
	50 Hz	10.000 mV	10.006 mV	-0.006 mV	0.054 mV	2.0
	50 Hz	20.000 mV	20.020 mV	-0.020 mV	0.081 mV	2.0
	50 Hz	50.000 mV	50.014 mV	-0.014 mV	0.081 mV	2.0
	50 Hz	80.000 mV	80.028 mV	-0.028 mV	0.081 mV	2.0
	50 Hz	90.000 mV	90.049 mV	-0.049 mV	0.081 mV	2.0
	1 k Hz	10.000 mV	10.007 mV	-0.007 mV	0.066 mV	2.0
	1 k Hz	50.000 mV	50.024 mV	-0.024 mV	0.091 mV	2.0
	1 k Hz	90.000 mV	90.04 mV	-0.04 mV	0.12 mV	2.0
	10 k Hz	90.000 mV	90.03 mV	-0.03 mV	0.12 mV	2.0
1 V	50 Hz	0.90000 V	0.90022 V	-0.00022 V	0.00047 V	2.0
	1 k Hz	0.90000 V	0.90028 V	-0.00028 V	0.00081 V	2.0
	10 k Hz	0.90000 V	0.90022 V	-0.00022 V	0.00081 V	2.0
10 V	50 Hz	1.00000 V	1.00000 V	0.00000 V	0.00050 V	2.0
	50 Hz	2.00000 V	1.99903 V	0.00097 V	0.00082 V	2.0
	50 Hz	5.0000 V	4.9987 V	0.0013 V	0.0035 V	2.0
	50 Hz	8.0000 V	7.9981 V	0.0019 V	0.0043 V	2.0
	50 Hz	9.0000 V	8.9979 V	0.0021 V	0.0046 V	2.0
	1 k Hz	1.00000 V	1.00009 V	-0.00009 V	0.00087 V	2.0
	1 k Hz	5.0000 V	4.9993 V	0.0007 V	0.0050 V	2.0
	1 k Hz	9.0000 V	8.9990 V	0.0010 V	0.0071 V	2.0
	10 k Hz	9.0000 V	8.9977 V	0.0023 V	0.0071 V	2.0
100 V	50 Hz	90.000 V	89.995 V	0.005 V	0.046 V	2.0
	1 k Hz	90.000 V	90.00 V	0.00 V	0.12 V	2.0
	10 k Hz	90.000 V	90.02 V	-0.02 V	0.12 V	2.0
750 V	50 Hz	75.000 V	75.011 V	-0.011 V	0.045 V	2.0
	50 Hz	150.000 V	149.965 V	0.035 V	0.065 V	2.0
	50 Hz	375.00 V	374.86 V	0.14 V	0.30 V	2.0
l	50 Hz	600.00 V	599.84 V	0.16 V	0.33 V	2.0
	50 Hz	675.00 V	674.88 V	0.12 V	0.35 V	2.0
Ì	50 Hz	750.00 V	749.90 V	0.10 V	0.40 V	2.0
ŀ	1 k Hz	75.000 V	75.02 V	-0.02 V	0.11 V	2.0
ŀ	1 k Hz	375.00 V	374.90 V	0.10 V	0.98 V	2.0
İ	1 k Hz	750.00 V	750.0 V	0.0 V	1.5 V	2.0
	10 k Hz	750.00 V	750.3 V	-0.3 V	1.5 V	2.0









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Tanggal Terima

Date of acceptance Tanggal Kalibrasi

: 25 September 2020 : 25 September 2020 Nomor SO

SO number Nomor Sertifikat

: 10/140-1200/143

Certificate number

Calibration date Tempat Kalibrasi

Calibration place

Temperature

: PT. SENTRAL TEHNOLOGI MANAGEMEN

Kondisi Lingkungan **Environment condition**

: Suhu

: (24.4 ± 0.6) °C

Kelembaban Humidity

: $(60 \pm 1)\%$ rh

HASIL KALIBRASI

Result of Calibration

arameter :	AC Curr	ent	197			
Range	Freq	Standard Nominal	Inst. Reading	Correction	Uncertainty	k
1 mA	50 Hz	0.000000 mA	0.00000 mA	0.00000 mA	0.00029 mA	2.0
	50 Hz	0.100000 mA	0.10002 mA	-0.00002 mA	0.00048 mA	2.0
	50 Hz	0.90000 mA	0.9003 mA	-0.0003 mA	0.0023 mA	2.0
	1k Hz	0.90000 mA	0.9003 mA	-0.0003 mA	0.0069 mA	2.0
	5 k Hz	0.90000 mA	0.9004 mA	-0.0004 mA	0.0071 mA	2.0
10 mA	50 Hz	9.0000 mA	9.004 mA	-0.004 mA	0.019 mA	2.0
	1 k Hz	9.0000 mA	9.006 mA	-0.006 mA	0.019 mA	2.0
	5 k Hz	9.0000 mA	9.004 mA	-0.004 mA	0.019 mA	2.0
100 mA	50 Hz	90.000 mA	90.04 mA	-0.04 mA	0.18 mA	2.0
	1 k Hz	90.000 mA	90.04 mA	-0.04 mA	0.18 mA	2.0
	5 k Hz	90.000 mA	90.04 mA	-0.04 mA	0.18 mA	2.0
1 A	50 Hz	0.90000 A	0.9002 A	-0.0002 A	0.0020 A	2.0
	1 k Hz	0.90000 A	0.9005 A	-0.0005 A	0.0020 A	2.0
	5 k Hz	0.90000 A	0.9001 A	-0.0001 A	0.0020 A	2.0
10 A	50 Hz	1.00000 A	1.0000 A	0.0000 A	0.0020 A	2.0
	50 Hz	9.0000 A	9.0006 A	-0.0006 A	0.0074 A	2.0
	50 Hz	10.0000 A	10.0007 A	-0.0007 A	0.0074 A	2.0
	1 k Hz	10.0000 A	9.99964 A	0.00036 A	0.000000 A	2.0







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Tanggal Terima

: 25 September 2020

Nomor SO

: -

Date of acceptance Tanggal Kalibrasi

: 25 September 2020

SO number
Nomor Sertifikat

: 10/140-1200/143

Calibration date
Tempat Kalibrasi

Certificate number

Calibration place

: PT. SENTRAL TEHNOLOGI MANAGEMEN

Kondisi Lingkungan

: Suhu

Temperature

: (24.4 ± 0.6) °C

Kelembaban Humidity : $(60 \pm 1)\% \text{ rh}$

Environment condition

Result of Calibration

Range	Standard Nominal	Inst. Reading	Correction	Uncertainty
100 Ω	0.00 Ω	0.0253 Ω	-0.0253 Ω	0.0058 Ω
	10.00 Ω	10.0344 Ω	-0.0344 Ω	
	20.00 Ω	20.040 Ω	-0.040 Ω	0.0071 Ω
	50.00 Ω	50.051 Ω	-0.051 Ω	0.063 Ω
	90.00 Ω	90.083 Ω	-0.081 Ω	0.074 Ω
1 kΩ	0.10000 kΩ	0.100080 kΩ	-0.00080 kΩ	0.087 Ω
	0.2000 kΩ	0.199969 kΩ	0.000030 kΩ	0.000014 kΩ
	0.5000 kΩ	0.499947 kΩ	0.000051 kΩ	0.000014 kΩ
	0.9000 kΩ	0.899915 kΩ	0.000085 kΩ	0.000014 kΩ
10 kΩ	1.0000 kΩ	0.99961 kΩ		0.000014 kΩ
	2.000 kΩ	1.99998 kΩ	0.00039 kΩ	0.00012 kΩ
	5.000 kΩ	4.99909 kΩ	0.00002 kΩ	0.00012 kΩ
	9.000 kΩ	8.99806 kΩ	0.00091 kΩ	0.00012 kΩ
100 kΩ	10.000 kΩ	9.9955 kΩ	0.00194 kΩ	0.00012 kΩ
	20.00 kΩ	20.0000 κΩ	0.0045 kΩ	0.0013 kΩ
	50.00 kΩ	49.9980 κΩ	0.0000 kΩ	0.0013 kΩ
	90.00 kΩ	90.0029 κΩ	0.0020 kΩ	0.0013 kΩ
1 ΜΩ	0.10000 ΜΩ	0.100009 ΜΩ	-0.0029 kΩ	0.0013 kΩ
	0.2000 ΜΩ	0.200004 ΜΩ	-0.000009 MΩ	0.000018 MΩ
	0.5000 ΜΩ		-0.000004 MΩ	0.000018 MΩ
	0.9000 ΜΩ	0.499998 ΜΩ	0.000002 MΩ	0.000018 MΩ
10 ΜΩ	1.0000 ΜΩ	0.899883 MΩ	0.000117 ΜΩ	0.000018 MΩ
	2.000 ΜΩ	1.000 ΜΩ	0.000 MΩ	0.069 MΩ
	5.000 MΩ	2.001 ΜΩ	-0.001 MΩ	0.069 MΩ
	9.000 ΜΩ	5.000 MΩ	ΩM 000.0	0.069 MΩ
100 ΜΩ	10.0 ΜΩ	8.999 MΩ	0.001 MΩ	0.069 MΩ
200 1112		10 ΜΩ	0 ΜΩ	694 MΩ
	20.0 MΩ	20 ΜΩ	0 ΜΩ	694 MΩ
	50.0 MΩ	50 MΩ	0 ΜΩ	694 MΩ
	90.0 MΩ 100.0 MΩ	90 MΩ 99 MΩ	0 ΜΩ	694 MΩ







2.0

1.5 MΩ

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Tanggal Terima

Date of acceptance

Tempat Kalibrasi

Environment condition

Calibration place Kondisi Lingkungan

Tanggal Kalibrasi

Calibration date

: 25 September 2020

: 25 September 2020

: PT. SENTRAL TEHNOLOGI MANAGEMEN

: Suhu

Temperature

100.00 MΩ

: (24.4 ± 0.6) °C

Kelembaban

Humidity

Nomor SO

SO number

Nomor Sertifikat

Certificate number

0.6 MΩ

: $(60 \pm 1)\% \text{ rh}$

: 10/14/0-1200/143

HASIL KALIBRASI

Result of Calibration

100 MΩ

Parameter :	Resistance (lanjutan)				
100 Ω	0.210 Ω	-0.0086 Ω	0.2186 Ω	0.0058 Ω	2.0
100 Ω	0.308 Ω	0.0980 Ω	0.2100 Ω	0.0058 Ω	2.0
100 Ω	1.281 Ω	0.9991 Ω	0.2819 Ω	0.0059 Ω	2.0
100 Ω	10.220 Ω	10.0032 Ω	0.2168 Ω	0.0071 Ω	2.0
100 Ω	100.239 Ω	99.989 Ω	0.250 Ω	0.014 Ω	2.0
1 kΩ	1.000197 kΩ	0.99975 kΩ	0.00045 kΩ	0.00012 kΩ	2.0
10 kΩ	10.00049 kΩ	9.9983 kΩ	0.0022 kΩ	0.0013 kΩ	2.0
100 kΩ	99.9928 kΩ	99.9731 kΩ	0.0197 kΩ	0.0080 kΩ	2.0
1 ΜΩ	0.999985 MΩ	1.00024 MΩ	-0.00025 MΩ	0.00015 MΩ	2.0
10 MΩ	10.0011 MΩ	9.993 MΩ	0.008 MΩ	0.068 MΩ	2.0

99.4 MΩ







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Tanggal Terima

Date of acceptance

: 25 September 2020

Tanggal Kalibrasi Calibration date

Tempat Kalibrasi

Calibration place Kondisi Lingkungan **Environment condition**

: 25 September 2020

: PT. SENTRAL TEHNOLOGI MANAGEMEN

: Suhu

: (24.4 ± 0.6) °C

Kelembaban Humidity

Nomor SO

SO number

Nomor Sertifikat

Certificate number

 $: (60 \pm 1)\% \text{ rh}$

: 10/140-1200/143

Temperature

HASIL KALIBRASI Result of Calibration

Range	Standard Nominal	Inst. Reading	Correction	Uncertainty	-
10 Hz	1.00 Hz	1.0 Hz	0.0 Hz		k
10 Hz	10.0 Hz	10 Hz		3.9 Hz	2.0
100 Hz	20.0 Hz	20 Hz	0 Hz	39 Hz	2.0
100 Hz	50.0 Hz		O Hz	78 Hz	2.0
1000 Hz		50 Hz	0 Hz	196 Hz	2.0
	100.0 Hz	100 Hz	O Hz	196 Hz	2.0
1000 Hz	200.0 Hz	200 Hz	O Hz	610 Hz	2.0
1000 Hz	500.0 Hz	500 Hz	0 Hz	1,851 Hz	2.0
10 kHz	0.90 kHz	0.9 kHz	0.0 kHz	3.5 kHz	
10 kHz	1.00 kHz	1.0 kHz	0.0 kHz		2.0
100 kHz	9.0 kHz	9 kHz		2.0 kHz	2.0
100 kHz	10.0 kHz	10 kHz	0 kHz	35 kHz	2.0
300 kHz	90.0 kHz	100 100 100 100 100	0 kHz	20 kHz	2.0
300 kHz		90 kHz	0 kHz	333 kHz	2.0
300 kHz	30.0 kHz	30 kHz	0 kHz	91 kHz	2.0
	270.0 kHz	270 kHz	0 kHz	900 kHz	2.0
300 kHz	300.0 kHz	300 kHz	0 kHz	1,024 kHz	2.0

Keterangan/Note:

Tanda # adalah nilai yang tidak terakreditasi, namun ditampilkan untuk kelengkapan.

Standar Kalibrasi/Refference Standard

: Transmille 9041A (ELC001C) & Transmille EA015 (ELC001B)

Tertelusur ke SI melalui/Traceable to SI through

: Transmille Ltd. (UKAS Accredited Laboratory)

Prosedur Kalibrasi/Calibration Procedure

: STM/IK-KELISTRIKAN/08

Ketidakpastian pengukuran yang dilaporkan adalah ketidakpastian bentangan pada tingkat kepercayaan sekitar 95% dengan factor cakupan k

The report of measurement's uncertainty is expanded uncertainty with confidence level approximately 95% with coverage factor k

Penunjukan Sebenarnya = Penunjukan Alat + Koreksi

Actual Reading = Instrument's Reading + Correction

Hasil kalibrasi ini hanya berlaku untuk alat ukur yang identifikasinya tercantum dalam sertifikat ini.

This calibration ressult is only applicable to the measurement device which identification is listed on this certificate.

Disella oleh Checked by

Antonius Rendra S. D. Manajemen Teknis

Akhir dari Sertifikat / End of Certificate —