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METRA*Hit*®22 ... 26S/M CAT IV

Analog-Digital Multimeters with Signal Generator

3-349-026-03
6/3.03

METRA*Hit*®22/23/24/25/26

- Precision multimeter (V, dB, Ω, F, Hz, °C/°F)
- Resolution: 10 µV, 10 mΩ
- Integrated quartz movement
  for MIN-MAX recording with reference to real-time
- Signal generator functions

METRA*Hit*®23/24/25/26

- Current measurement (10 A),
  direct or with current transformer:
  Display value is based on a transformation
  ratio of 1000:1 or 10,000:1
- METRA*Hit*®23S: 16 A measuring range

METRA*Hit*®22M/26M

- Large,128 kB measurement data memory
- Quartz movement for data logging with reference to real-time
- Can be operated with accessory power pack

Signal generator function

CAT IV

DIN EN ISO/IEC 17025

QUALITY MANAGEMENT SYSTEM

DQS Certified per
DIN EN ISO 9001 Reg. No.1262

Applications

The 22S through 26M multimeters are rugged and reliable, hand-held or system instruments for maintenance, initial start-up, training and R&D in industry, for government authorities, in the test lab, in manufacturing and quality assurance, as well as at universities.

Features

TRMS Value for Distorted Waveshapes with METRA*Hit*®25S and 26S/M

The utilized measuring method allows for TRMS measurements independent of waveshape.
METRA*Hit*®25S: TRMS AC to 1 kHz
METRA*Hit*®26S/M: TRMS AC and (AC+DC) to 20 kHz.

Pulse and Pulse Run Generator

This function allows for the testing of circuits and transmission paths by reading out individual pulses or pulse bursts with an amplitude of 3 V and a frequency ranging from 1 to 1000 Hz to the measurement input sockets.

Additional Functions

Continuity testing with acoustic signal, voltage for diode continuity, event counting (number and duration of events), stopwatch, data compare and long-range capacitance measurement. The integrated temperature measurement function allows for the connection of platinum sensors.

Automatic Blocking System (ABS) *

The automatic blocking system prevents incorrect connection of the measuring cables, as well as incorrect selection of the measured quantity. The potential for danger to the user, the instrument and the system is thus substantially reduced, and in many cases entirely eliminated.

Overload Protection

Overload protection safeguards the instrument in the voltage range. Overranging is indicated with an acoustic signal.
The FUSE display indicates that the fuse for the active current measuring range has blown.

Automatic / Manual Measuring Range Selection

Measured quantities are selected with the rotary switch. The measuring range is automatically matched to the measurement value. The AUTO/MAN key allows for manual selection as well.

Display of Negative Values at the Analog Scale

Both negative and positive values are displayed for zero-frequency quantities at the analog scale, so that measured quantity fluctuations around the zero point can be observed.

Automatic Storage of Measurement Values *

The digitally displayed measurement value can be saved with the “DATA” function. A patented process assures that the actual measurement value is stored instead of a random value, even for rapidly changing measured quantities. The stored measurement value appears at the digital display.

* Patented

METRA*Hit*®22 ... 26S/M CAT IV
Analog-Digital Multimeters with Signal Generator

Storage of MIN-MAX Values

In addition to display of current values, the minimum or the maximum value can be continuously updated and stored to memory.

Sampling Rate

The sampling rate defines the interval at which the respective measurement value is transmitted to the interface, or to measurement value memory.
Depending upon the measured quantity, sampling rates can be adjusted in steps of 1, 2 and 5 from 0.05 s to 10 s.

Continuity Testing

Testing for short-circuits and interruptions is possible with continuity testing. In addition to the display function, an acoustic signal can be activated which sounds if the adjustable limit value is violated.

Battery Saving Circuit

The instrument is switched off automatically if the measurement value remains constant for approx. 10 minutes, and if none of the keys or switches have been activated during this period. Automatic shut-down can be disabled.

Protective Cover for Aggressive Environments

A soft rubber cover with as tilt stand protects the instrument from impacts and drops. The rubber material assures a solid stance, even if the instrument has been placed on top of a vibrating surface.

Infrared Transmission of Measurement Data

Measurement data can be transmitted to a standard serial port at a PC via the infrared interface which is provided as standard equipment, and the optional METRA*Hit* ®SI232 adapter (for S versions) or the optional METRA*Hit* ®BD232 adapter (for M versions). Up to six instruments can transmit measurement data to the PC online (up to 10 instruments off-line).

Calibration

The multimeters are shipped with a DKD calibration certificate. In addition to standard quantities, our DKD calibration lab is also accredited for high value resistance of up to 30 GΩ/1000 V.

The instruments can be re-calibrated at our DKD calibration lab after the customer defined calibration interval has expired (manufacturer recommendation: 1 year).

Applicable Regulations and Standards

IEC 61010-1 DIN EN 61010 Part 1 VDE 0411-1	Safety requirements for electrical equipment for measurement, control and laboratory use
DIN 43751	Digital measuring instruments
IEC/EN 61326	EMC Requirements Electrical instruments for control technology and laboratory use
VDI/VDE 3540	Reliability of measuring, control and regulating devices
DIN EN 60529 DIN VDE 0470 Part 1	Test instruments and test procedures – Protection provided by enclosures (IP code)

Additional Functions, METRA*Hit*®22M/26M

Memory Mode

The instrument is equipped with a quartz-movement-synchronized measurement value memory (128 kB), with a capacity for 13,000 to 60,000 measurement values depending upon configuration. Data are stored to temporary memory, or are transmitted directly to a PC. The system acquires measurement values with reference to real-time, which allows for use as a real-time data logger.

At high speed sampling frequencies (≤ 1 kHz) the instrument functions as a high speed recorder, and with slow sampling (... 10 min) as a dot matrix printer. Long-term recording is supported by the sleep mode:
For sampling periods of > 20 s, the electronics are switched on for 10 s after each measuring cycle, and are switched off for the remainder of the sampling period. Battery service life is thus extended to a maximum of 6000 hours (8 to 9 months).

Sampling rates can be adjusted from 1 ms to 10 minutes in steps of 1, 2 and 5 depending upon the measured quantity. In addition, measurement values can be stored to memory by pressing a key.

The contents of the memory can be read out with the help of a PC which has been connected to the multimeter via the METRA*Hit* ®BD232 IR adapter, and METRAwin®10/METRA*Hit* ® analysis software.

Features List

METRA*Hit*® Function	22S	22M	23S	24S	25S	26S	26M
Current – A_{max}	not applicable		... 16 A	... 10 A/max. 16 A/30 s			
Band Width V_{AC}	... 1 kHz					... 20 kHz	
Rectification	arithmetic mean value				$TRMS_{AC}$	$TRMS_{AC, AC+DC}$	
Pulse Generator	•	•	•	•	•	•	•
MIN-MAX / Data Hold	•	•	•	•	•	•	•
Continuity, Diode	•	•	•	•	•	•	•
Fuse, 1000 V	not applicable		1.6 A	1.6 A and 16 A			
Power Current Transformer	—	—	•	—	—	—	—
Clip-On Transformer Factor	•	•	•	•	•	•	•
128 kByte Memory	—	•	—	—	—	—	•
Quartz Movement	•	•	•	•	•	•	•
Protective Rubber Cover	—	•	•	•	•	•	•

Standard Equipment

1 Multimeter
1 Cover for aggressive environments (except METRA*Hit*®22S)
1 KS17-2 cable set
2 Batteries
1 Operating instructions
1 DKD calibration certificate

Guarantee

3 years material and workmanship

1 to 3 years for calibration (depending on the scope of application)

Characteristic Values

Meas. Function	Measuring Range		Resolution at Upper Range Limit 30000 [1]	Resolution at Upper Range Limit 3000 [1]	Input Impedance —	Input Impedance ≂	Intrinsic Deviation at max. Resolution under Reference Conditions ±(... % of rdg. + ... d) —	Intrinsic Deviation at max. Resolution under Reference Conditions ±(... % of rdg. + ... d) ≂ [5]	Overload Capacity [4] Value	Overload Capacity [4] Duration	Meas. Function
V [10]	300 mV		10 µV	100 µV	> 20 MΩ	5 MΩ // < 50 pF	0.05 + 3 [7]	0.5 + 30 (> 300 d)	1000 V DC AC eff sine	cont.	**V**
	3 V		100 µV	1 mV	11 MΩ	5 MΩ // < 50 pF	0.05 + 3	0.2 + 30 (> 300 d)			
	30 V		1 mV	10 mV	10 MΩ	5 MΩ // < 50 pF	0.05 + 3	0.2 + 30 (> 300 d)			
	300 V		10 mV	100 mV	10 MΩ	5 MΩ // < 50 pF	0.05 + 3	0.2 + 30 (> 300 d)			
	1000 V		100 mV	1 V	10 MΩ	5 MΩ // < 50 pF	0.05 + 3	0.2 + 30 (> 300 d)			
dB	see table on next page				—	same as for V ≂	—	± 0.1 dB [11]			**dB**
					approx. Voltage Drop at Upper R. Limit —	≂	—	≂ [5]			
A [10]	300 µA		10 nA	100 nA	160 mV	160 mV	0.1 + 5	0.5 + 30	0.36 A	cont.	**A**
	3 mA		100 nA	1 µA	160 mV	160 mV	0.1 + 5	0.5 + 30			
	30 mA		1 µA	10 µA	200 mV	200 mV	0.05 + 5	0.5 + 30			
	300 mA		10 µA	100 µA	300 mV	300 mV	0.5 + 5	0.5 + 30			
	3 A		100 µA	1 mA	110 mV	110 mV	0.5 + 5	0.75 + 30	10 A [6]	cont.	
	10 A		1 mA	10 mA	350 mV	350 mV	0.5 + 5	0.75 + 30			
					Open-Circuit Voltage	Meas. Current at Upper R. Limit	±(... % of rdg. + ... d)				
Ω	300 Ω		10 mΩ		0.6 V	max. 250 µA	0.1 + 5 [7]		1000 V DC AC eff sine	5 min.	Ω
	3 kΩ		100 mΩ		0.6 V	max. 45 µA	0.1 + 5 [7]				
	30 kΩ		1 Ω		0.6 V	max. 4.5 µA	0.1 + 5				
	300 kΩ		10 Ω		0.6 V	max. 1.5 µA	0.1 + 5				
	3 MΩ		100 Ω		0.6 V	max. 150 nA	0.1 + 5				
	30 MΩ		1 kΩ		0.6 V	max. 15 nA	2 + 5				
Ω 🔊	300 Ω			0.1 Ω	max. 3 V	max. 1.2 mA	1 + 3				Ω 🔊
⊣◁ 🔊	3 V [12]			1 mV	max. 3 V	max. 1.2 mA	0.2 + 5				⊣◁ 🔊
⊣◁	3 V [12]		100 µV		max. 3 V	max. 1.2 mA	0.2 + 3				⊣◁
					Discharge Resist.	$U_{0\,max}$	±(... % of rdg. + ... d)				
F	3 nF			1 pF	10 MΩ	3 V	1 + 6 [7]		1000 V DC AC eff sine	5 min.	**F**
	30 nF			10 pF	10 MΩ	3 V	1 + 6 [7]				
	300 nF			100 pF	1 MΩ	3 V	1 + 6				
	3 µF			1 nF	100 kΩ	3 V	1 + 6				
	30 µF			10 nF	11 kΩ	3 V	1 + 6				
	300 µF			100 nF	2 kΩ	3 V	5 + 6				
	3000 µF			1 µF	2 kΩ	3 V	5 + 6				
	30000 µF			1 µF	2 kΩ	3 V	5 + 60				
					f_{min} [3]		±(... % of rdg. + ... d)	max. measuring voltage			
Hz	300.00 Hz		0.01 Hz		1 Hz		0.1 + 1 [8]	1000 V	1000 V	cont.	**Hz**
	3.0000 kHz		0.1 Hz		1 Hz		0.1 + 1 [8]	1000 V			
	100.00 kHz		10 Hz		1 Hz		0.1 + 1 [8]	< 30 kHz: 300 V			
								> 30 kHz: 30 V			
⏱	100 min [2]		100 ms (1/10 s)				±15 d				⏱
							±(... % of rdg. + ... d)				
°C/°F	Pt 100/ Pt 1000	– 200.0 ... – 100.0 °C	0.1 °C				1 K [9]		1000 V DC/AC eff sine	5 min.	°C/°F
		– 100.0 ... + 100.0 °C					0.8 K + 3 [9]				
		+ 100.0 ... +850.0 °C					0.5 + 3 [9]				

1) Display: 4¾ place, a different resolution and sampling rate can be selected for the storage and transmission of measurement values in the rAtE menu.
2) Stopwatch: format: **mm:ss:h** where m = minutes, s = seconds and h = hundredths of a second, max.: 99:59.9; key-controlled only
3) Smallest measurable frequency for sinusoidal measurement signals symmetric to the zero point
4) At 0° to + 40° C
5) Values of less than100 digits are suppressed. 15 (20) ... 45 ... 65 Hz ... 20 (1) kHz sine, see page 4 for influences.
6) 12 A – 5 min., 16 A – 30 s
7) ZERO appears at display when "zero balancing" function is activated.
8) Range 300 mV ≂: U_E = 50 $mV_{eff/rms}$ . . . 300 $mV_{eff/rms}$
3 V ≂: U_E = 0,3 $V_{eff/rms}$ . . . 3 $V_{eff/rms}$
30 V ≂: U_E = 3 $V_{eff/rms}$ . . . 30 $V_{eff/rms}$
300 V ≂: U_E = 30 $V_{eff/rms}$ . . . 300 $V_{eff/rms}$
1000 V ≂: U_E =300 $V_{eff/rms}$ . . . 1000 $V_{eff/rms}$
9) Plus sensor error
10) METRA*Hit*®26S/M and 25S: TRMS measurement
11) Indicated error values apply as of a displayed value of 10% of the measuring range.
12) Display up to max. 1.8 V, otherwise „OL" is shown on the display

Key: rdg. = reading, R = measuring range, d = digit(s)

Measuring Function	Measuring Range	22S/M	23S	24S	25S[10]	26S/M[10]
A	300 µA	—	•	•	•	•
	3 mA	—	•	•	•	•
	30 mA	—	•	•	•	•
	300 mA	—	•	•	•	•
	3 A	—	•	•	•	•
	10 A	—	16 A[12]	•	•	•
A ~⧘	mA/A	—	•	•	•	•
A ~⧘	mV/A	•	—	—	—	—

12) Without 16 A fuse

METRA*Hit*®22 ... 26S/M CAT IV

Analog-Digital Multimeters with Signal Generator

dB Ranges

Measuring Ranges	Display Range for Reference Voltage U_{REF} = 0.775 V	Resolution
300mV ⁓	– 48 dB ... – 8 dB	0.01 dB
3 V ⁓	– 28 dB ...+ 12dB	0.01 dB
30 V ⁓	– 8 dB ...+ 32 dB	0.01 dB
300 V ⁓	+ 2 dB ...+ 52 dB	0.01 dB
1000 V ⁓	+ 22 dB ...+ 63 dB	0.01 dB
	Display (dB) = 20 lg U_x (V) /U_{REF}	

Real-Time Clock

Accuracy ±1 min. per month (except for METRA*Hit*®22S)

Temp. Influence 50 ppm per K

Influencing Quantities and Influence Errors

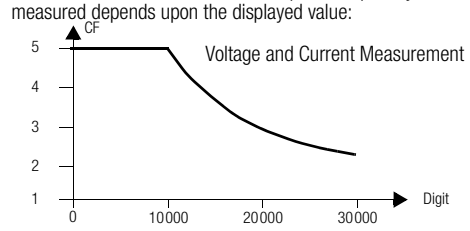
Influencing Quantity	Influence Range	Measured Quantity / Measuring Range [1]	Influence Error (...% + ... d) / 10 K
Temperature	0 °C ... +21 °C and +25 °C ... +40 °C	V ⎓	0.2 + 10
		V ⁓	0.4 + 10
		300 µA ... 30 mA ⎓ / ⁓	0.5 + 10
		300 mA ⎓ / ⁓	0.5 + 10
		3 A / 10 A ⎓ / ⁓	0.75 + 10
		300 Ω ... 300 kΩ	0.2 + 10
		3 MΩ	0.2 + 10
		30 MΩ	1 + 10
		3 nF ... 30 µF	0.5 + 10
		Hz	0.5 + 10
		°C (Pt100)	0.5 + 10

METRA*Hit*®26S/M:	TRMS AC and (AC+DC)	15 Hz to 20 kHz
METRA*Hit*®25S:	TRMS AC	20 Hz to 1 kHz
METRA*Hit*®22/23/24:	mean value rectification, AC	20 Hz to 1 kHz

Influencing Quantity	Influence Range (max. resolution)	Frequency	Intrinsic Error [2] ±(... % of rdg. + ... d)
Frequency V_{AC}	300.00 mV	> 15 Hz ... 45 Hz	2.5 + 40 (> 300 d)
		> 65 Hz ... 1 kHz	1.0 + 30 (> 300 d) [3]
		> 1 kHz ... 20 kHz	3.0 + 50 (> 300 d)
	3.0000 V 300.00 V [4]	> 15 Hz ... 45 Hz	2.2 + 40 (> 300 d)
		> 65 Hz ... 1 kHz	0.7 + 30 (> 300 d) [3]
		> 1 kHz ... 20 kHz	2.2 + 50 (> 300 d)
	1000.0 V [4]	> 15 Hz ... 45 Hz	2.2 + 40 (> 300 d)
		> 65 Hz ... 1 kHz	2 + 30 (> 300 d)
		> 1 kHz ... 10 kHz	10 + 50 (> 300 d)

Influencing Quantity	Influence Range (max. resolution)	Frequency	Intrinsic Error [2] ±(... % of rdg. + ... d)
Frequency I_{AC}	300.00 µA ... 300.00 mA	> 15 Hz ... 45 Hz	1 + 30
		> 65 Hz ... 1 kHz	
	3.0000 A 10.000 A	> 15 Hz ... 45 Hz	1 + 30
		> 65 Hz ... 1 kHz	3 + 30

1) With zero balancing
2) Indicated error values apply as of a displayed value of 10% of the measuring range.
3) for METRA*Hit*®22 to 25: 2% + 30 d
4) Power limitation: frequency x voltage max. 3,000,000 V x Hz

Influencing Quantity	Influence Range	Measured Quantity / Measuring Range	Influence Error [2]
Measured Quantity Waveshape [3]	crest factor CF 1 ... 3	V ⁓, A ⁓	± 1% of rdg.
	crest factor CF > 3 ... 5	V ⁓, A ⁓	± 3% of rdg.
	The allowable crest factor CF for the periodic quantity to be measured depends upon the displayed value: 		

Influencing Quantity	Influence Range	Measured Quantity / Measuring Range [1]	Influence Error
Relative Humidity	75% 3 days instrument off	V, A, Ω F, Hz °C	1 x intrinsic error

Influencing Qty.	Influence Range	Measuring Range	Damping
Common-Mode Interference Voltage	influencing quantity max. 1000 V ⁓	V ⎓	> 90 dB
	influencing quantity max. 1000 V ⁓ 50 Hz, 60 Hz sine	300 mV ... 30 V ⁓	> 60 dB
		300 V ⁓	> 60 dB
		1000 V ⁓	> 60 dB
Series-Mode Interference Voltage	influencing quantity V ⁓ , nominal measuring range value, max. 1000 V ⁓ , 50 Hz, 60 Hz sine	V ⎓ [4]	> 40 dB
	influencing quantity max. 1000 V ⎓	V ⁓	> 60 dB

1) With zero balancing
2) Except for sinusoidal waveshapes
3) METRA*Hit*®26S/M and 25S only
4) For METRA*Hit*®22/23/24: except for mV range

Reference Conditions

Ambient Temperature	+23 °C ±2 K
Relative Humidity	45 ... 55%
Measured Qty. Frequency	40 ... 60 Hz
Measured Qty. Waveshape	sine
Battery Voltage	3 V ±0.1 V
Power Pack Voltage	4.5 V ±0.2 V

Response Time (after manual range selection)

Measured Quantity / Measuring Range	Digital Display Response Time	Measured Quantity Jump Function
V ⎓ , V ⁓, A ⎓ , A ⁓	1.5 s	from 0 to 80% of the measuring range upper limit
300 Ω ... 3 MΩ	2 s	from ∞ to 50% of the measuring range upper limit
30 MΩ	5 s	
Continuity	< 50 ms	
⇻	1.5 s	
3 nF ... 300 µF	max. 2 s	from 0 to 50% of the measuring range upper limit
3 000 µF	max. 7 s	
30 000 µF	max. 14 s	
>10 Hz	max. 1.5 s	
°C	max. 3 s	

Power Supply

Battery	2 ea. 1.5 V mignon cells (2 x AA size) alkaline-manganese cells per IEC LR6 zinc-carbon battery per IEC R6
Service Life	alkaline-manganese cells: approx. 100 hr.
Battery Test	" ⊣⊢ " symbol is displayed automatically when battery voltage drops to below approx. 2.3 V, or if voltage from the power pack is less than approx. 3 V.

Display

LC display field (65 mm x 30 mm) with analog and digital display of unit of measure, type of current and various special functions.

Analog

Display	LCD scale with pointer
Scale Length	55 mm for V ⎓ and A ⎓, 47 mm for all other ranges
Scaling	∓ 5 ... 0 ... ± 30 with 35 graduations for ⎓, 0 ... 30 with 30 graduations for all other ranges
Polarity Display	with automatic reversal
Overload Display	triangle is displayed
Measuring Rate	20 measurements per second

Digital

Display / Char. Height	7 segment characters / 12 mm
Places	4¾ places ≙ 31,000 steps
Overload Display	"OL" is displayed
Polarity Display	"–" sign is displayed when plus pole is connected to "⊥"
Measuring Rate	2 measurements per second

Display Refresh

V (DC, AC+DC), V AC, A, Ω, ⇥⊢, EVENTS AC+DC, °C (Pt100/1000)	2 times per second
Hz, EVENTS AC	1 time per second

Data Interface

Data Transmission	via optical, infrared interface through the housing

With Accessory Interface Adapter

Type	RS232C, serial, per DIN 19241
Baud Rate	METRA*Hit*®BD232: 9600 baud METRA*Hit*®SI232-II: all baud rates

Fuses for METRA*Hit*®23/24/25/26

Fuses for Ranges **to 300 mA**	FF (UR) 1.6 A/1000 V AC/DC, 6.3 mm x 32 mm, 10 kA breaking capacity at 1000 V with resistive load, protects all current ranges up to 300 mA in combination with power diodes
to 10 A (except for METRA*Hit*® 23S)	FF (UR) 16 A/1000 V AC/DC, 10 mm x 38 mm, 30 kA breaking capacity at 1000 V AC/DC with resistive load, protects 3 A and 10 A ranges

Electrical Safety

Protection Class	II per IEC 61010-1/EN 61010-1/ VDE 0411-1	
Overvoltage Category	III	IV (except for 23S)
Operating Voltage	1000 V	600 V
Contamination Level	2	2
Test Voltage	7.4 kV~ per IEC 61010-1/EN 61010-1/ VDE 0411-1	

Electromagnetic Compatibility (EMC)

Interference Emission	EN 61326: 2002 class B
Interference Immunity	EN 61326: 2002 IEC 61000-4-2: 1995 IEC 61000-4-2: 1995 / A1: 1998 8 kV atmospheric discharge 4 kV contact discharge IEC 61000-4-3: 1995 + A1: 1998 3 V/m IEC 61000-4-4: 1995 0.5 kV

Ambient Conditions

Operating Temperature Range	–20° C ... +50° C
Storage Temperature Range	–25° C ... +70° C (without batteries)
Relative Humidity	max. 75%, no condensation allowed
Elevation	to 2000 m
Deployment	indoors; outdoors: only in the specified ambient conditions

Mechanical Design

Protection	casing: IP 50, connector sockets: IP 20
Dimensions	84 mm x 195 mm x 35 mm
Weight	approx. 350 gr. with batteries

Accessories

METRA*Hit*®BD232 Interface Adapter

METRA*Hit*®22/23/24/25/26 multimeters can be adjusted, and their parameters can be configured, with the help of the METRA*Hit*®BD232 bidirectional adapter, and measurement data can be transmitted to a PC. The adapter has no memory of its own, but can be used to read out data from the memory at the METRA*Hit*®22M/26M. It supports all measuring functions and data formats for the METRA*Hit*®20 series, and is included in the user-friendly BD-Pack 1.

METRA*Hit*®SI232-II Memory Adapter *(for METRAHit®22/23/24/25/26S)*

The METRA*Hit*®SI232-II memory adapter can be plugged in to hand-held multimeters and allows for on-site storage of measurement data without a PC, as well as subsequent uploading to a PC. Data are synchronized with an integrated clock. The date format is limited to a maximum of 30,000 digits during storage.

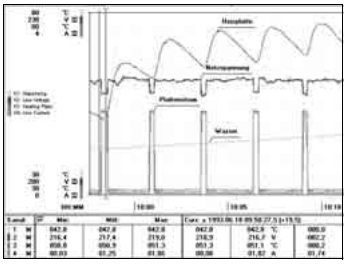
Memory:
128 kB *(equal to about 100,000 measurement values, can be increased by a factor of 10 to 20 if data compression is used)*

Adjustable Sampling Rate:
50 ms to 1 min.

METRAwin®10/METRA*Hit*® Software

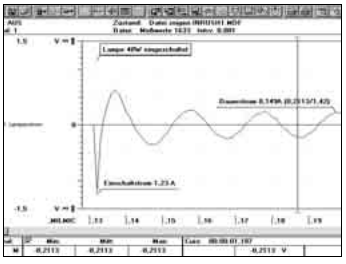
METRAwin®10/METRA*Hit*® software (compatible with WINDOWS as of version 3.11) is used to process and display measurement data at a PC. Sampling can be performed manually with an adjustable sampling interval, or in a signal-dependent fashion (with adjustable signal hysteresis). Storage of data in ASCII format can be controlled with two trigger thresholds per measuring channel, or with the system clock.

Y(t) Recorder



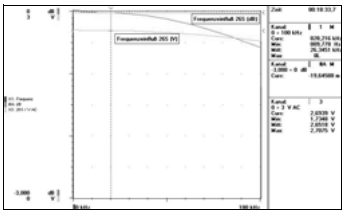
Acquired measurement values from a maximum of four freely selectable channels are displayed at the monitor as a line graph with horizontal time axis and are measured with two pointers.
The amplitudes and time axes of stored signals can be zoomed or compressed. The time scale can be displayed either in absolute time, or in relative measuring time.

High Speed Y(t) Recorder



Rapid changes to measurement values can be recorded with METRA*Hit*®22M/26M and 29S instruments at sampling rates of 1 kHz and 2 kHz respectively.

XY Recorder

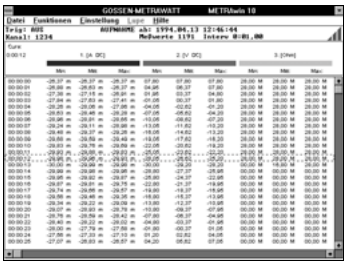


Acquired data from two to four freely selectable channels are displayed at the monitor as an XY graph and are measured with the cursor. All scales are freely adjustable, as is the case with all display formats.

Multimeter

Transmitted measurement values from a maximum of four freely selectable channels are displayed at the monitor in the online mode either in digital format with additional analog scale, or as an analog pointer instrument with additional digital display.

Table



Acquired measurement data from up to 10 channels are displayed at the monitor numerically in easy to read tabular form.

Mathematics Functions

High performance mathematics functions are capable of analyzing, linking and displaying measurement data either online or off-line.

Sampling (online)

Sampling can be performed either manually (with the mouse), automatically with an adjustable interval (50 ms to 60 min) or signal-dependent with adjustable signal hysteresis (0 to 500 digits). Data can be controlled with time and window triggers and can be stored to memory as multiple data files.

Measurement Data Processing

High performance calculator and linearization functions allow for further processing of measurement data. For example, mA signals from sensors or transducers can be displayed directly as pressure values, active power and many other quantities.

Order Information

Designation	Type	Article Number
All multimeters include the KS17-2 measurement cable, operating instructions, DKD calibration certificate and the GH18 protective rubber cover (except for METRA*Hit*® 22S)		
Analog-digital multimeter with signal generator for training and plant operations (current measurement with accessory current clip only)	METRA*Hit* 22S	M222A
Same as METRA*Hit* 22S but with 128 kByte memory	METRA*Hit* 22M	M222B
Analog-digital multimeter with signal generator for energy technology applications with 16 A current range (without 16 A fuse)	METRA*Hit* 23S	M223A
Universal analog-digital multimeter with signal generator	METRA*Hit* 24S	M224A
$TRMS_{AC}$ analog-digital multimeter with signal generator, V_{AC} to 1 kHz	METRA*Hit* 25S	M225A
$TRMS_{AC,\ AC+DC}$ analog-digital multimeter with signal generator, V_{AC} 15 Hz to 20 kHz	METRA*Hit* 26S	M226A
Same as METRA*Hit* 26S but with 128 kByte memory	METRA*Hit* 26M	M226B
Hardware Accessories		
Mains power pack, 230 V~/4.5 V, 600 mA for METRA*Hit*®22M/26M	NA4/500	Z218A
Protective rubber cover with strap	GH18 [2]	GTZ 3212 000 R0001
Voltage measuring probe for electrical power installations of up to 1000 V	KS30	GTZ 3204 000 R0001
High-voltage probe, 3 kV/3 V	HV3	GTZ 3431 011 R0001
High-voltage probe, 30 kV/30 V (for direct voltage only)	HV30	GTZ 3431 001 R0001
Pt100 temperature sensor for surface and immersion measurements, −40 ... +600 °C	Z3409	GTZ 3409 000 R0001
Pt1000 temperature sensor for measurements in gases and liquids, −50 ... +220 °C	TF220	Z102A
Pt100 oven sensor, −50 ... +550 °C	TF550	GTZ 3408 000 R0001
10 adhesive Pt100 temperature sensors, −50 ... +550 °C	TS-Chipset	GTZ 3406 000 R0001
Carrying pouch	F829	GTZ 3301 000 R0003
Ever-ready case	F836	GTZ 3302 000 R0001
Ever-ready case for 2 METRA*Hit*®S with METRA*Hit*®SI232 and accessories	F840	GTZ 3302 001 R0001
Hard case (with room for 1 METRA*Hit*® including GH18, 1 KS17-2 and 1 clip-on current transformer/sensor)	HC20	Z113A
Fuse link (10 ea.)	FF(UR) 1.6A/ 1000V AC/DC	Z109C
Fuse link (10 ea.)	FF(UR) 16A/ 1000V AC/DC	Z109B

Accessory Clip-On Current Transformers and Sensors		
Electric-Set consisting of: F829 carrying pouch, WZ11A clip-on current transformer (15 ... 180 A~, 1 mA/1 A~) and measurement cable	Electric-Set	GTZ 3236 000 R0001
WZ11A and B clip-on current transformers and sensors [D]		
Clip-on transformers 1 … 200 A~, 1000:1, 48…65…400 Hz	WZ11A [1]	Z208A
Clip-on current sensor, adjustable, 0.5 … 20 A~, 1 mV/mA and 5 … 200 A~, 1 mV/A, 48 … 65 … 500 Hz	WZ11B [2]	Z208B
WZ12A ... D clip-on current transformers and sensors [D] frequency range: 45...65 …500 Hz, jaw opening: 15 mm max. cable diameter		
Clip-on current transformer 15 A … 180 A, 1000:1	WZ12A [1]	Z219A
Clip-on current sensor 10 mA … 100 A, 0.1 mV/mA	WZ12B [2]	Z219B
Clip-on current sensor, adjustable 1 mA … 15 A, 1 mV/mA and 1 A … 150 A, 1 mV/A	WZ12C [2]	Z219C
Clip-on current transformer 30 mA … 150 A, 1000:1	WZ12D [1]	Z219D
Clip-on current transformer 4 … 500 A~, 1 mA~/A~ with cable and protective circuit jaw opening: 30 mm max. cable dia.	Z3511 [1]	GTZ 3511 000 R0001
Clip-on current transformer 0,5 … 1000 A~, 1 mA~/A~ with cable and protective circuit jaw opening: 54 mm max. cable dia.	Z3512 [1]	GTZ 3512 000 R0001
Clip-on current transformer 1 … 2000 A~, 1 mA~/A~ with cable and protective circuit jaw opening: 64 mm max. cable dia.	Z3514 [1]	GTZ 3514 000 R0001
Clip-on current sensor, active, with battery (service life: 30 hr.) measuring range: AC 20 A measuring range: DC 30 A frequency range: DC ... 20 kHz output: 10 mV/A jaw opening: 19 mm max. cable dia.	Z201A [2]	Z201A
Clip-on current sensor, active, with battery (service life: 50 hr.) measuring ranges: AC 20 A/200 A measuring ranges: DC 30 A/300 A frequency range: DC ... 10 kHz output: 10 mV/A or 1 mV/A jaw opening: 19 mm max. cable dia.	Z202A [2]	Z202A
Clip-on current sensor, active, with battery (service life: 50 hr.) measuring ranges: AC 200 A/1000 A measuring ranges: DC 300 A/1000 A frequency range: DC ... 10 kHz output: 1 mV/A jaw opening: 32 mm max. cable dia.	Z203A [2]	Z203A
Amp*FLEX* flexible current sensor [D] 30/300 A, 3 V 300/3000 A, 3 V 1000 A, 1 V 1/10 kA, 1 V	 AF033A [1] AF33A [1] AF11A [1] AF101A [1]	 Z207A Z207B Z207D Z207C

[1] For METRA*Hit*®23/24/25/26
[2] For METRA*Hit*®22S/M
[3] For METRA*Hit*®22M/26M, especially recommended
[D] Data sheet available

For additional information concerning accessories see our catalog: Measuring Instruments and Testers.

METRAHit®22 ... 26S/M CAT IV
Analog-Digital Multimeters with Signal Generator

Software Accessories		
1-channel pack consisting of: METRA*Hit*®BD232 bidirectional interface adapter, cable, METRAwin®10/METRA*Hit*® software and installation instructions	BD-Pack 1 [3]	Z215A
1-channel memory pack consisting of: METRA*Hit*®SI232 memory adapter, cable, *METRAwin*®10/METRA*Hit*® software and installation instructions	1-CH. Pack [1]	GTZ 3231 020 R0001
4-channel memory pack consisting of: 4 METRA*Hit*®SI232 memory adapters, cable, *METRAwin*®10/METRA*Hit*® software and installation instructions	4-CH. Pack [1]	GTZ 3234 020 R0001
Memory adapter for METRA*Hit*®S	SI232-II [D]	GTZ 3242 020 R0001
Bidirectional interface adapter	BD232 [3]	GTZ 3242 100 R0001
1-channel pack including cable, METRAwin®10/METRA*Hit*® software and installation instructions	Z3231	GTZ 3231 000 R0001
RS232 interface cable, 2 m long, (included with Z3231)	Z3241	GTZ 3241 000 R0001
METRAwin®10/METRA*Hit*® software update and installation instructions	Z3240	GTZ 3240 000 R0001

Accessories

F836 Ever-Ready Case
for multimeter (without protective rubber cover) and accessories

F829 Carrying Pouch
for multimeter (with or without GH18 protective rubber cover) and accessories

Hard case HC20
for multimeters (with protective rubber cover) and accessories

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GOSSEN METRAWATT GMBH
Thomas-Mann-Str. 16-20
90471 Nürnberg • Germany
Member of GMC Instruments Group

Phone +49-(0)-911-8602-0
Fax +49-(0)-911-8602-669
E-Mail info@gmc-instruments.com
www.gmc-instruments.com

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