

NI-DMM Instrument Driver Quick Reference Guide



Easy Programming for National Instruments Digital Multimeter





IVI-DMM 2.0 Specification has obsoleted some previous NI-DMM functions. Obsolete functions are listed along with their replacements.

ICON	FUNCTION NAME	DESCRIPTION
Examples		
	niDMM_Getting_Started	niDMM_Getting_Started is a simple application function that initializes the instrument, configures powerline frequency, and controls the measurement parameters: function, resolution, range, and auto zero. It initiates the measurement, waits until the DMM has returned to the Idle state, returns the measured values, and then closes the instrument session.
	niDMM_Easy_IO_Simple_Acq	niDMM_Easy_IO_Simple_Acq is a simple application function that configures powerline frequency and controls the measurement parameters: function, resolution, range, and auto zero. It initiates the measurement, waits until the DMM has returned to the Idle state, returns the measured values, closes the specified session, and deallocates resources.
	niDMM_Easy_IO_Trigger_Acq	niDMM_Easy_IO_Trigger_Acq is a simple application function that configures powerline frequency and controls the measurement parameters: function and range. Either the DMM or an external source initiates handshaking with the instrument, depending on the values you specify in Trigger Source and Trigger Slope controls. After handshaking has been initiated, the DMM takes measurements, returns the measured values, closes the specified session, and deallocates resources.
	niDMM_Easy_IO_Scanning_Acq	niDMM_Easy_IO_Scanning_Acq is a simple application function that configures powerline frequency and controls the measurement parameters: function and range. It initiates the measurements, waits for the trigger you specify in the Trigger Source control, takes measurements, returns the measured values, sends the voltmeter complete signal to the destination you specify in Measurement Complete Destination control, closes the specified session, and deallocates resources.
	niDMM_Easy_IO_Advanced_Acq	niDMM_Easy_IO_Advanced_Acq is an application function that configures powerline frequency and controls the measurement parameters of function and range. Either the DMM or an external source initiates handshaking with the instrument, depending on the value you specify in Handshaking Initiation control. After the measurement has been initiated, the DMM waits for the trigger you specify in the Trigger Source control, then it waits for the delay you specify in Trigger Delay control before it takes measurements. After the DMM returns to Idle state, it returns the measured values, sends the voltmeter complete signal to the destination you specify in Measurement Complete Destination control, closes the specified session, and deallocates resources.
	niDMM_Easy_IO_Interval_Scanning_Acq	niDMM_Easy_IO_Interval_Scanning_Acq is a simple application function that configures powerline frequency and the measurement parameters of function and range. It initiates the measurements, takes the measurements using the interval specified by Sample Interval, returns the measured values, closes the specified session, and deallocates resources.


ICON	FUNCTION NAME†	TYPE	PARAMETER	VALUE TO SET, COMMENTS
Initialize Functions				
	niDMM_Initialize (niDMM_init)	ViRsrc ViBoolean ViBoolean ViSession*	resourceName IDQuery resetDevice vi	DAQ:#, where # is the device number VI_TRUE, VI_FALSE VI_TRUE, VI_FALSE Reference to new session handle
	niDMM_Initialize With Options (niDMM_InitWithOptions)	ViRsrc ViBoolean ViBoolean ViString ViSession*	resourceName IDQuery resetDevice Option String vi	DAQ:#, where # is the device number VI_TRUE, VI_FALSE VI_TRUE, VI_FALSE Simulate = 0, RangeCheck = 1 QueryInstrStatus = 1, Cache = 1 Reference to new session handle

† Function names for C, C++, LabWindows/CVI, and Visual Basic are in parentheses.



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ICON	FUNCTION NAME†	TYPE	PARAMETER	VALUE TO SET, COMMENTS
Application Functions				
	niDMM_Simple_Acquisition	ViSession ViReal64 ViInt32 ViReal64 ViInt32 ViReal64 ViInt32 ViReal64 []	vi Powerline Frequency Function Range Auto Zero Resolution Number of Measurements Measurements	Session handle 60 Hz, 50 Hz DC volts, AC volts, and so on Default = 0.02 Auto Zero Off, Auto Zero On Default = 0.00001 Default = 4 Output
	niDMM_Triggered_Acquisition	ViSession ViReal64 ViInt32 ViReal64 ViInt32 ViInt32 ViInt32 ViReal64 []	vi Powerline Frequency Function Range Trigger Source Trigger Slope Number of Measurements Measurements	Session handle 60 Hz, 50 Hz DC volts, AC volts, and so on Default = 0.02 Immediate, External, TTL0, and so on Rising Edge, Falling Edge Default = 4 Output
	niDMM_Advanced_Acquisition	ViSession ViReal64 ViInt32 ViReal64 ViInt32 ViInt32 ViInt32 ViReal64 ViReal64 ViInt32 ViInt32 ViReal64 []	vi Powerline Frequency Function Range Auto Zero Measurement Complete Destination Trigger Source Trigger Delay Resolution Handshaking Initiation Number of Measurements Measurements	Session handle 60 Hz, 50 Hz DC volts, AC volts, and so on Default = 0.02 Auto Zero Off, Auto Zero On None, External, TTL0, and so on Immediate, External, TTL0, and so on Default = -1 Default = 0.00001 DMM, Switch Default = 4 Output
	niDMM_Scanning_Acquisition	ViSession ViReal64 ViInt32 ViReal64 ViInt32 ViInt32 ViReal64 ViInt32 ViReal64 []	vi Powerline Frequency Function Range Trigger Source Number of Measurements Resolution Measurement Complete Destination Measurements	Session handle 60 Hz, 50 Hz DC volts, AC volts, and so on Default = 0.02 Immediate, External, TTL0, and so on Default = 4 Default = 0.00001 None, External, TTL0, and so on Output




ICON	FUNCTION NAME†	TYPE	PARAMETER	VALUE TO SET, COMMENTS
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Application Functions (Continued)				
	niDMM_Interval_Scanning_Acquisition	ViSession	vi	Session handle
		ViReal64	Powerline Frequency	60 Hz, 50 Hz
		ViInt32	Function	DC volts, AC volts, and so on
		ViReal64	Range	Default = 0.02
		ViInt32	Trigger Source	Immediate, External, TTL0, and so on
		ViInt32	Number of Measurements	Default = 4
		ViReal64	Resolution	Default = 0.01
		ViInt32	Sample Trigger	Default = Immediate
ViReal64	Sample Interval	Default = 0.1 seconds		



Measure				
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	niDMM_Measure	ViSession	vi	Session handle
		ViInt32	Function	DC volts, AC volts, and so on
		ViInt32	Maximum Time	Default = 5,000 ms
		ViReal64*	Measurement	Output
	niDMM_Measure_Multi_Point (niDMM_MeasureMultiPoint)	ViSession	vi	Session handle
		ViInt32	Function	DC volts, AC volts, and so on
		ViInt32	Maximum Time	Default = 5,000 ms
		ViInt32	Array Size	Default = 1
		ViReal64 []	Reading Array	Output
		ViInt32*	Actual Points	Output









Configure				
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	niDMM_Configure_Measurement (niDMM_ConfigureMeasurement)	ViSession	vi	Session handle
		ViInt32	Function	DC volts, AC volts, and so on
		ViReal64	Range	Default = 0.02
		ViReal64	Resolution	Default = 0.00001
	niDMM_Configure (OBSOLETE—replace with niDMM_Configure_Measurement)	ViSession	vi	Session handle
		ViInt32	Function	DC volts, AC volts, and so on
		ViReal 64	Range	Default = 0.02
		ViReal 64	Resolution	Default = 0.00001
		ViReal 64	Minimum Frequency	Default = 20.00
		ViReal 64	Maximum Frequency	Default = 25,000.00
	niDMM_Configure_Multi_Point (niDMM_ConfigureMultiPoint)	ViSession	vi	Session handle
		ViInt32	Trigger Count	Default = 1
		ViInt32	Sample Count	Default = 1
		ViInt32	Sample Trigger	Immediate, External, TTL0, and so on
		ViReal64	Sample Interval	Default = 0.0




Read				
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	niDMM_Read	ViSession	vi	Session handle
		ViInt32	Maximum Time	Milliseconds
		ViReal64*	Measurement	Output
	niDMM_Read_Multi_Point (niDMM_ReadMultiPoint)	ViSession	vi	Session handle
		ViInt32	Maximum Time	Milliseconds
		ViInt32	Array Size	Default = 4
		ViReal64 []	Reading Array	Output
		ViInt32*	Actual Points	Output




ICON	FUNCTION NAME†	TYPE	PARAMETER	VALUE TO SET, COMMENTS
Initiate				
	niDMM_Initiate	ViSession	vi	Session handle
	niDMM_Abort	ViSession	vi	Session handle
Fetch				
	niDMM_Fetch	ViSession ViInt32 ViReal64*	vi Maximum Time Measurement	Session handle Milliseconds Output
	niDMM_Fetch_Multi_Point (niDMM_FetchMultiPoint)	ViSession ViInt32 ViInt32 ViReal64 [] ViInt32*	vi Maximum Time Array Size Reading Array Actual Points	Session handle Milliseconds Default = 4 Output Output
Low-Level Measure				
	niDMM_Send_Software_Trigger (niDMM_SendSoftwareTrigger)	ViSession	vi	Session handle
	niDMM_Configure_Trigger (niDMM_ConfigureTrigger)	ViSession ViInt32 ViReal64	vi Trigger Source Trigger Delay	Session handle Default = immediate Default = 0.00
	niDMM_Configure_Start_Trigger (niDMM_ConfigureStartTrigger) (OBSOLETE—replace with niDMM_Configure Trigger)	ViSession ViInt32 ViInt32	vi Start Trigger Source Start Trigger Slope	Session handle Default = immediate Default = Rising Edge
	niDMM_Configure_Powerline_Frequency (niDMM_ConfigurePowerlineFrequency)	ViSession ViReal64	vi Powerline Frequency	Session handle Default = 60 Hz
	niDMM_Set_Powerline_Frequency (niDMM_SetPowerlineFrequency) (OBSOLETE—replace with niDMM_Configure_Powerline_Frequency)	ViSession ViReal 64	vi Powerline Frequency	Session handle Default = 60 Hz
	niDMM_Configure_Auto_Zero (niDMM_ConfigureAutoZero)	ViSession ViInt32	vi Auto_Zero	Session handle Default = Auto Zero Off
	niDMM_Set_Auto_Zero (niDMM_SetAutoZero) (OBSOLETE—replace with niDMM_Configure_Auto_Zero)	ViSession ViInt32	vi Auto_Zero	Session handle Default = Auto Zero Off
	niDMM_Configure_Meas_Complete_Dest (niDMM_ConfigureMeasCompleteDest)	ViSession ViInt32	vi Measurement Complete Destination	Session handle Default = none
	niDMM_Configure_Measurement_Complete (niDMM_ConfigureMeasurementComplete) (OBSOLETE—replace with niDMM_Configure_Meas_Complete_Dest)	ViSession ViInt32 ViInt32	vi Measurement Complete Designation Slope	Session handle Default = none Default = Rising Edge

ICON	FUNCTION NAME†	TYPE	PARAMETER	VALUE TO SET, COMMENTS
	niDMM_Configure_Meas_Complete_Slope (niDMM_ConfigureMeasCompleteSlope)	ViSession ViInt32	vi Slope	Session handle Default = Rising Edge
	niDMM_Configure_Trigger_Slope (niDMM_ConfigureTriggerSlope)	ViSession ViInt32	vi Trigger Slope	Session handle Default = Rising Edge
	niDMM_Set_Trigger_Slope (OBSOLETE—replace with niDMM_Configure_Trigger_Slope)	ViSession ViInt32	vi Slope	Session handle Default = Rising Edge
	niDMM_Configure_Sample_Trigger_Slope (niDMM_ConfigureSampleTriggersSlope)	ViSession ViInt32	vi Slope	Session handle Default = Rising Edge
	niDMM_Configure_Sample_Delay_Mode (niDMM_ConfigureSampleDelayMode)	ViSession ViInt32	vi Sample Delay Mode	Session handle Default = 0
	niDMM_Get_Digits_Of_Precision (niDMM_GetDigitsOfPrecision)	ViSession ViInt32*	vi Digits	Session handle Output (3.5/4.5/5.5)
	niDMM_Is_Over_Range (niDMM_IsOverRange)	ViSession ViReal64 ViBoolean*	vi Measurement Over range?	Session handle Input from Read/Fetch Output
	niDMM_Configure_AC_Bandwidth (niDMM_ConfigureACBandwidth)	ViSession ViReal64 ViReal64	vi Minimum Frequency Maximum Frequency	Session handle Default = 20.00 Default = 25,000.00

Capabilities

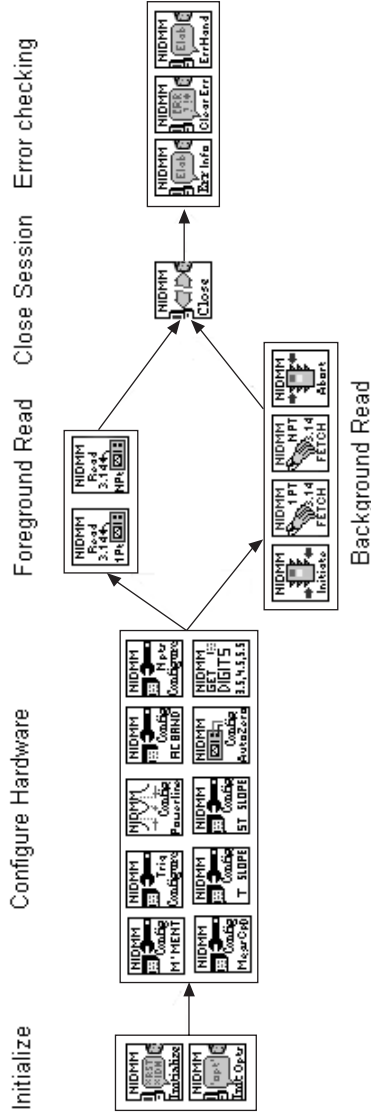
	niDMM_Calculate_Accuracy (niDMM_CalculateAccuracy)	ViSession ViReal64 ViReal64* ViReal64*	vi Frequency Of Interest Reading Multiplier Offset	Session handle Default = 20.00 Output Output
	niDMM_Get_Measurement_Period (niDMM_GetMeasurementPeriod)	ViSession ViReal64*	vi Measurement Period	Session handle Output
	niDMM_Get_Auto_Range_Value (niDMM_GetAutoRangeValue)	ViSession ViReal64*	vi Auto Range Value	Session handle Output

Error Info

	niDMM_Error_Handler	ViSession ViBoolean ViChar []	vi Message Box Error Message	Session handle Default = Do not show dialog Output
	niDMM_Clear_Error_Info (niDMM_ClearErrorInfo)	ViSession	vi	Session handle
	niDMM_Get_Error_Info (niDMM_GetErrorInfo)	ViSession ViStatus* ViStatus* ViChar []	vi Primary Error Secondary Error Error Message	Session handle Default = 0 x 0 Default = 0 x 0 Output

ICON	FUNCTION NAME†	TYPE	PARAMETER	VALUE TO SET, COMMENTS
Utility				
	niDMM_Format_Measurement_Absolute (niDMM_FormatMeasurementAbsolute)	ViInt32 ViReal64 ViReal64 ViReal64 ViChar[] ViChar[] ViChar[]	Function Range Resolution Measurement Mode String Range String Data String	DC volts, AC volts, and so on Default = 0.02 Absolute units Output Output Output Output
	niDMM_Format_Measurements (niDMM_FormatMeas) (OBSOLETE—replace with niDMM_Format_Measurement_Absolute)	ViInt32 ViReal 64 ViReal 64 ViReal64 ViChar[] ViChar[] ViChar[]	Function Range Resolution Measurement Mode String Range String Data String	DC volts, AC volts, and so on Default = 0.02 3.5 digits, 4.5 digits, 5.5 digits Output Output Output Output
	niDMM_Read_Status (niDMM_ReadStatus)	ViSession ViInt32* ViInt16*	vi Backlog Done	Session handle Points in buffer Is Acquisition Done?
	niDMM_Revision_Query (niDMM_revision_query)	ViSession ViChar [] ViChar []	vi Instrument Driver Revision Firmware Revision	Session handle Output Output
	niDMM_Error_Query (niDMM_error_query)	ViSession ViInt32* ViChar []	vi Error Code Error Message	Session handle Output Output
	niDMM_Error_Message (niDMM_error_message)	ViSession ViInt32 ViBoolean ViChar []	vi Error Code Message Box Error Message	Session handle Output Default = Do not show dialog (does not apply to C/C++) Output
	niDMM_Self_Test niDMM_self_test	ViSession ViInt32* ViChar []	vi Self Test Result Self Test Message	Session handle Output Output
	niDMM_Reset (niDMM_reset)	ViSession	vi	Session handle
Close				
	niDMM_Close (niDMM_close)	ViSession	vi	Session handle

Programming Flow





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