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**NI-DAQ™**  
DAQ Assistant



# DAQ

20081370467L-0118

DAQNI            LabVIEW 7.xNI        LabWindows™/CVI™ 7.xNI  
Measurement Studio 7.xDAQ    NI-DAQmxDAQNI LabVIEW  
SignalExpress 2.x

NI [NI](#)

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- *DAQNI-DAQmx(DAQ)*
- *LabVIEWLabVIEWVILabVIEWLabVIEW*
- *LabWindows/CVI HelpLabWindows/CVI Help*
  - **Using LabWindows/CVI**
  - **Library ReferenceLabWindows/CVI**
  - **Programmer ReferenceLabWindows/CVI**
  - **Example ProgramsLabWindows/CVI**
  - **Tools LibraryLabWindows/CVI**

LabWindows/CVI**Help»Contents**

- *NI-DAQmxMAXMAXNI-DAQmxDAQSCXIPXISCC*  
RTSIMAX »»|
- *NI Measurement StudioMicrosoft Visual C++ Visual Basic.NET*  
Measurement StudioVisual Studio .NET **Help»Conten**
- *NI-DAQmxNI-DAQmxNI NI-DAQmxNI* »»**National**  
**Instruments»NI-DAQ**
- *LabVIEWNI-DAQmxLabVIEW 7.xDAQNI-DAQmxDAQ*  
DAQ NI-DAQmx *LabVIEWLabVIEWNI-DAQmx*

< > DIO<3..0>

»                   »»»



Web

## (Windows)

:

•

•

•

•

•

**(Windows)**

“”

(\*)(?):“prog\*”“program”“programmatically”“progress”  
“?ext”“next”“text”

“example AND (program OR VI)”“example  
program”“example VI”





- **AND**
- **OR**
- **NOT**
- **NEAR**

- 
- “program”“programs”“programming”
-

# (Windows)

:

1.

2.

3.



4.

**PDF**

PDFPDFAdobe Acrobat Viewer

DAQLabVIEWLabVIEW SignalExpressLabWindows/CVI  
Measurement StudioNIDAQMAXDAQ

DAQ

- 
- 
- 
- 
- 
- NI
- 



DAQLabVIEW 7.xLabWindows/CVIMeasurement Studio  
LabVIEW SignalExpress 2.x

NI-DAQmx    NI-DAQmxDAQMAXNI-DAQmx  
DAQMAXNI-DAQmx API    NI-DAQ(Legacy)MAX

NI-DAQmx

NI-DAQmx

MAXMAX



LabVIEW 8.0LabVIEW



# DAQ

DAQNI

*LabVIEW LabWindows/CVI Help Measurement Studio Help [NI-DAQmx](#)*  
[Key Concepts](#)

# DAQ

DAQNIMAXDAQ      DAQ

DAQ.


DAQ

- [LabVIEW](#)
- [LabWindows/CVI](#)
- [Measurement Studio](#)
- [MAX](#)

[LabVIEW SignalExpress](#)DAQDAQ

# LabVIEWDAQ

DAQ

- “DAQmx”                    **DAQmx**
- LabVIEW 8.0MAX                    »**NI-DAQmx**
- LabVIEW 7.xLabVIEW    **DAQ**
- “DAQ”Express VIVI  
                    DAQMAX                    “DAQ”Express VINI-  
DAQmx “DAQ”Express VILabVIEW“DAQ”Express  
VI                    **NI-DAQmx**
- LabVIEW 7.x    »    “”                    **Data Acquisition with NI-DAQmx**

LabVIEWLabVIEW    *LabVIEWNI-DAQmx*

LabVIEWLabVIEW

DAQ

# LabWindows/CVIDAQ

Tools»Create/Edit DAQmx TasksDAQ

Create/Edit DAQmx TasksMAXLabWindows/CVIMAX

LabWindows/CVI MAX *LabWindows/CVI Help*

DAQmxLoadTask**Task NameNew Task**LabWindows/CVIMAX

DAQ

# MAXDAQ

DAQ

1.

LabVIEW Real-Time

2. “” **NI-DAQmx**

3. DAQ

4. .

5. MAX




“”

MAXDAQ

# Measurement StudioDAQ

Measurement StudioDAQmxDAQmxMAXMeasurement Studio  
DAQmx

1. DAQmx
2. **Project»Add New Item**Add New Item
3. Categories**Measurement Studio»Assistants**
4. Templates**DAQmx Task**
5. DAQmxDAQmx
6. New DAQmx TaskMAX  
 MAX
7. **Finish**DAQ

DAQ .mxb .mxbDAQmxDAQNI

## DAQ



LabWindows/CVIMeasurement StudioMAX

1. MAX

LabVIEW RT

2. “” **NI-DAQmxDAQ**

LabVIEWLabWindows/CVIMeasurement Studio version 7. xDAQ

- LabVIEWLabVIEW RTDAQmxDAQ **DAQ**

- LabVIEW 8.0LabVIEWMAX »

3. LabVIEW 7.x **DAQmxDAQ**

4. LabWindows/CVIMeasurement StudioDAQ **DAQmx**  
MAX

5. .

6. .

- DAQLabVIEWLabWindows/CVI

- DAQMeasurement Studio »

- DAQMAX

# LabVIEW SignalExpressDAQ

LabVIEW SignalExpressDAQDAQLabVIEW SignalExpress  
DAQ

1. **Add Step**
2. **Acquire Signals»DAQmx AcquireGenerate Signals»DAQmx  
Generate**
3. I/O
- 4.
5. DAQ **Configuration** .DAQ



## DAQ

1. I/O
- 2.
- 3.
- 4.

TEDS    **TEDSDAQ**



- 5.
6. TEDSTEDS
- 7.



<Ctrl><Shift>

TEDS

"/O

# NI-DAQmx

- 1.
2. **NI-DAQmx**
- 3.
- 4.
5. DAQIDIDID
- 6.



“I/O

- 
- - NI-DAQmx 7.4
  - 
  - \_Dev1
- 256

## **LabVIEW**

DAQLabVIEWMAXDAQLabVIEWMAXLabVIEW  
MAXDAQI/OMAX

NIMAX

# LabVIEW

MAX

1. "DAQmx" "DAQmx"
- 2.
3. **DAQmxDAQmx**
4. DAQ
- 5.



## **LabVIEW SignalExpress**

LabVIEW SignalExpress 2.5MAXMAXDAQMAXLabVIEW  
SignalExpressMAXLabVIEW SignalExpress

# LabWindows/CVI

MAX

»/DAQmx

MAXMAX

»NI-DAQmx

# Measurement Studio

MAXMAX

.mxbDAQ

# MAX

MAXDAQ

- 1.
2. **NI-DAQmxNI-DAQmx**
- 3.
4. DAQ
- 5.



- 1.
- 2.
- 3.
- 4.
- 5.

DAQ. NI-DAQmx

NI-DAQmx NI-DAQmxRTD  
NI-DAQmx NI-DAQmx

NI-DAQmx  
NI-DAQmx

1.

- DAQ“”
  - MAX NI-DAQmx
  - LabVIEW“DAQmx”
- DAQ**

2. ““

3.

4. DAQ

5. MAX

## LabVIEW

1. "DAQmx"
- 2.
3. **DAQ**
4. DAQ
- 5.

## MAX

- 1.
- 2.
3. DAQ
- 4.



## MAXDAQ

- MAX
- LabVIEW



DAQMAXMAX  
DAQmx

“DAQ”Express VNI-

- LabWindows/CVI
- Measurement StudioFile»Save

## MAXNI



LabVIEW SignalExpressMAX

MAX

LabVIEW 7.x LabWindows/CVI 7. x Measurement Studio 7. x

*LabVIEW LabWindows/CVI Help Measurement Studio Help NI-DAQmx*  
LabVIEW SignalExpress DAQ *LabVIEW SignalExpress Help*



LabWindows/CVI Measurement Studio

# LabVIEW

1. "DAQmx" "DAQmx"
- 2.

## LabVIEW SignalExpress

LabVIEW SignalExpress 2.5MAX



LabVIEW SignalExpress

To

LabVIEW SignalExpressDAQ

1. **Virtual**DAQVirtual
2. DAQ

## LabWindows/CVI

1. DAQmxLoadTask
2. **Task Name**<Enter>
- 3.

## Measurement Studio

### Project»Add New Item

- MAXDAQmx Task Add New Item
- Visual C++ DAQmxUserCodeMAXDAQmxUserCode Add New Item
- .NET DAQmxUserControlMAXDAQmxUserControl Add New Item

MAX

# DAQExpress VINI-DAQmx

DAQMAX“DAQ”Express VINI-DAQmx



LabVIEWDAQExpress VI

“DAQ”Express VINI-DAQmx

1. “DAQ”Express VI      **NI-DAQmx**
2. DAQ
- 3.
4. “DAQ”Express VINI-DAQmx

“”

DAQ“”

- 1.
2. DAQ
3. “”
- 4.

“”

“”DAQ“”

“”

“”“”“”“”



7.xNI      LabVIEW 7.xLabVIEW SignalExpress 2.    x  
    LabWindows/CVI 7.x    Measurement Studio 7.xMAX  
LabVIEW 7.x  
DAQ

NI

- VIVI NI-DAQmx
- »»National Instruments NI-DAQmx Help  
Deployment

DAQDAQ

DAQ



*NI-DAQmx HelpDeployment*

- LabVIEW



“DAQ”Express VI

NI-DAQmx

## DAQNINI

- [LabVIEW](#)
- [LabVIEW SignalExpress](#)
- [LabWindows/CVI](#)
- [Measurement Studio](#)

**LabVIEW**

LabVIEWDAQ

## LabVIEW

- VI
- I/O/VIVIVI



- 

*NI-DAQmx HelpDeployment*

## LabVIEW

1. "DAQmx" "DAQmx"
- 2.
3. »

# LabVIEW“DAQ”Express VI

“DAQ”Express VIVI

**NI-DAQmx**“DAQ”Express VI



“DAQ”Express VIMAXMAX  
DAQmx

“DAQ”Express VINI-

# LabVIEW SignalExpress

LabVIEW SignalExpressLabVIEW SignalExpressLabVIEW

LabVIEW SignalExpressVI

*LabVIEW SignalExpress Help*

LabVIEW SignalExpressDAQLabVIEW“DAQ”Express VI

LabVIEW SignalExpressExpress VI

- DAQ
- DAQ
- DAQ
- DAQ

Express VILabVIEW SignalExpress



# LabWindows/CVI

LabWindows/CVIDAQ

LabWindows/CVI

- 
- DAQmxLoadTaskDAQ



*NI-DAQmx HelpDeployment*

## LabWindows/CVI

LabWindows/CVI

1. DAQmxLoadTask
2. **Generate DAQ Example Code**
- 3.
4. **OK**

LabWindows/CVI

DAQ( .mxb)DAQDAQ  
**Copy DAQ Task To ProjectMAX**

DAQmxLoadTask

- 
- DAQmxLoadTask
- include

# Measurement Studio

Measurement StudioDAQ.

## Measurement Studio

- 
- DAQmxLoadTaskDAQ



*NI-DAQmx HelpDeployment*

## Measurement Studio

.mxh



DAQDAQmx .mxh  
.mxhDAQ

.mxhDAQDAQmx

## .NET DAQmx

DAQmx.cs.vb .mxh .cs.vb

1. Solution Explorer **Show All Files**
2. Solution Explorer.mxb
3. .cs.vb **View Code**

.mxh**CustomTool**DAQ.mxb



.mxhSolution Explorer( **View»Properties Window**)

## Visual C++ DAQmx

DAQmx.h.cpp .mxh

Measurement Studio Add-In.mxbVisual C++ .mxhbadd-inDAQ

.mxh

Measurement Studio *NI Measurement Studio Help*

DAQ HTML

MAXNI-DAQmx

DAQHTML



DAQ

“HTML”HTML

- 
- 
- 
- 
- 

**HTML**HTML Microsoft Internet ExplorerHTML

## MIOSCXI

- CB-11
- CB-27
- CB-37FH
- CB-37FV
- CB-50
- CB-68LP
- CB-68LPR
- CB-C68
- DAQPad-6015/6016
- PXI-4204
- PXI-4220
- SCB-100
- SCB-68
- SCXI-1300, 1303, 1304, 1308, 1313, 1314, 1314T, 1315, 1317, 1320, 1321, 1322, 1327, 1328, 1338
- TB-2705
- TB-2706
- TB-2725
- TBX-68

**MAX**

DAQNI-DAQmx MAX

- 
- 
- 
- 

MAX

- 
- 

- 1.
- 2.



SCXI-1124SUPPLYISINKISINKGND



“ \_”



SCXI-1126 --0.54.48

# **RVDT**

(RVDT)

RVDTLVDT±30°70°RVDTServo360°

RVDTRVDT10RVDTRVDT70°

$$I_{(A)} = V_{(V)} / R_{(\Omega)}$$

$I \quad V \quad R$

4-20420



NI-DAQmxSCXI

NI-DAQmxNI-DAQmxAI excitation DAQmx Channel

# **LVDT**

( LVDT)LVDTLVDT

LVDT

LVDT45LVDT45

1(V)1(Ω)1(A)      100

$R = VI$

$R \quad V \quad I$

(Pa) 0 dB 60 70 dB 110 dB 150 dB

SPLLP

$$\text{SPL} = 20 \log_{10} (p/p_{\text{ref}})$$

$p$ Pa       $p_{\text{ref}} 20\mu\text{Pa}$

(με)

1.

2.



3.

4.



5.



6.



SCXI-1520SCXI-1314PXI-4220SCXI-1121SCXI-1321  
SCXI-1122SCXI-1322

**SCXI-1520SCXI-1314)PXI-4220**

AI.Bridge.Balance.CoarsePotAI.Bridge.Balance.FinePot  
AI.Bridge.InitialVoltage

**SCXI-1121SCXI-1321)**

SCXI-1321 AI.Bridge.InitialVoltage

**SCXI-1122SCXI-1322)**

AI.Bridge.InitialVoltage

- 
- 
- 
- 
- 
- 
- 
-




RTD, RTD(2,000-

10,000 Ω)(~200 Ω/°C) 300° C

RTD

NI-DAQmxSteinhart-Hart

$$\frac{1}{T} = A + B(\ln(R)) + C(\ln(R))^3$$

T R ABC



RTD(2,000-

10,000  $\Omega$ )(~200  $\Omega/^\circ\text{C}$ ) 300° C

RTD

NI-DAQmxSteinhart-Hart

$$\frac{1}{T} = A + B(\ln(R)) + C(\ln(R))^3$$

T R ABC

**RTD**

RTD

RTDRTDRTDRTDRTDDAQ



DAQ

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---

DAQ

*NI-DAQmx*

EMTTLTTL

- = 0 V - +0.8 V
- = +2 V - +5 V



DAQ

*NI-DAQmx*

EMTTLTTL

- = 0 V - +0.8 V
- = +2 V - +5 V

DAQ

EMTTLTTL

= 0 V - +0.8 V

= +2 V - +5 V

LED

DAQ

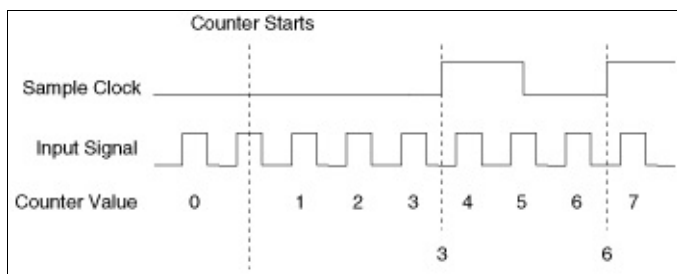
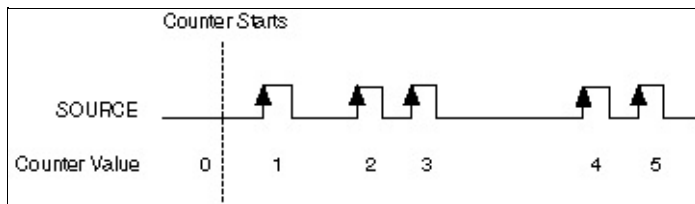
EMTTLTTL

- = 0 V - +0.8 V
- = +2 V - +5 V

LED

/M

5



TTL

- 
- 
- 

DAQ

NI-DAQmx

(Hz) = /

100 MHz 500 200 kHz

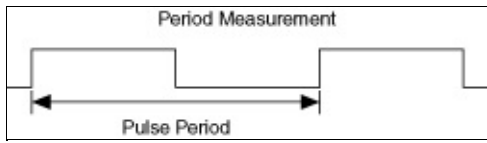
(20 MHz 100 kHz) NI-DAQmx

**1**

**2**

**2**

NI-DAQmx



$$(Hz) = 1$$

(20 MHz 100 kHz) NI-DAQmx

**1**

**2**

**2**

NI-DAQmx

NI-TIO

AB90°NI-TIOZ

“”ZZZABZ“Z”“Z”

“”VI“”/VI

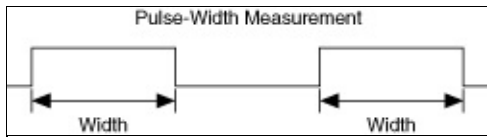


NI-TIO X1X2X4

AB90°NI-TIOZ

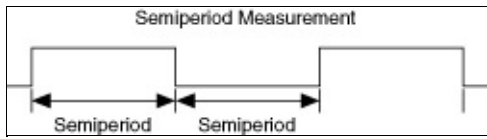
“”ZZZABZ“Z”“Z”

“”VI“”/VI



= /

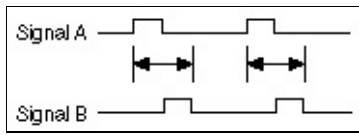
(20 MHz 100 kHz) NI-DAQmx



$$= 1/(Hz)$$

(20 MHz 100 kHz) NI-DAQmx

AB



$$= 1(\text{Hz})$$

NI-DAQmx

TTL

TTLNI-DAQmx

= /

(Hz) = /



“”/VI

TTL

NI-DAQmx

24100 kHz 0.006 Hz 50 kHz

4

0.024 Hz 200 kHz

= /

= /



/ A B C D E F G H I J K L M N P Q R S  
T U V W X Y Z

n	nano	$10^{-9}$
$\mu$	micro	$10^{-6}$
m	milli	$10^{-3}$
k	kilo	$10^3$
M	mega	$10^6$

%	
+	
-	
$\Omega$	
°	



## A

ADC

ADE LabVIEW

LabWindows/CVI

AI

AO

API VI

## **B**

BIOS /BIOSBIOS

FIFO

10

TTL

DAQ

SCXI

LabVIEW

## C

cDAQ CompactDAQNI cDAQ-9172

CH

CMRR (dB)

CompactDAQ C

C //CCompactDAQCompactRIONI USB-9XXX

10 S/s10

MADCADCS

OS

DAQMI/O(MIO)SCXI

I/O

NI- NI-DAQNI-DAQ 6.9.xNI-DAQ(Legacy)VINI-  
DAQ(Legacy) DAQ(Legacy)NI-DAQmx

## D

DAC

DAQ

DAQ DAQUSB1394(FireWire)PCMCIAADAQPadSCXIDAQ

DAQ

dB  $\text{dB}=20\log_{10} V1/V2$

DIO /

DMA

DSUB D-sub

DUT

0 - +10 V

832E8

E88

SCXIDAQSCXI

**E**

**E**

**F**

FIFO FIFOADC DAC

ADCDAQ ADCDAQ ADCDAQ

**G**

I/O

**H**

hex

Hz



# I

I/O /

IEEE P1451 IEEE TEDS

IEEE P1451.4 IEEE EPROM TEDS

IRQ (Interrupt ReQuest)

ISA PC

**J**

TEDSTEDSTEDS

DIP<sup>""</sup>

/ 16-482                     $N$      $N$

RVDT

DAQ

$N^{2^N} - 1$      $N^0$

AO

I/O I/O/I/O/I/O

**K**

**L**

LED

LSB

LVDT LVDTAC0

## **M**

MAX Measurement & Automation ExplorerNI

MIO I/O/OMIODAQEMIO

M

SCXIPXI

I/O I/O

## N

NI-DAQ NINI-DAQVILabVIEWNI

NI-DAQ NI-DAQNI-DAQmxNI-DAQ (Legacy)API  
7.x

NI- NI-DAQVINI-DAQNI-DAQmxDAQLabVIEW  
DAQmx LabWindows/CVIMeasurement StudioI/ODAQAPIVI

NI- MAX**NI-DAQmx**NI-DAQmx  
DAQmx

NRSE (NRSE)  
I/O

4 KB

## P

PCI Intel IISA EISA PCI 132 Mbytes/s

PCMCIA PCMCIA (Personal Computer Memory Card International Association)

PFI I/O

PID

PWM

PXI PCI Compact PCI PXI National Instruments 1997 PXI

PXI PXI PXI DAQ PCI DAQ RTSI

MAX " " " " "

Q



## **R**

RSE

RTD

RTSI NIDAQPXI DAQPXI

RVDT

NI-DAQmx

NI-DAQmx

VIVI

**S**

s

S

S/s

SCC DAQI/O

SCXI NIPCSCXI

STC

1090

1. I/O
2. DAQ

(DAQ) 1.  
2.

TTL

-5 V +5 V

## T

TCR 0°C100°C

TEDS IEEE1451.4TEDSID  
TEDSTEDSIEEE 1451.4TEDS

TEDS TEDSTEDS/TEDSRTDMaxim/Dallas  
Semiconductor

TEDS TEDSTEDSMaxim/Dallas Semiconductor

TTL

1. 8
  2. NI-DAQmxNI-DAQ (Legacy)  
NI-DAQmxNI-DAQ (Legacy)MAXNI-DAQmx  
MAX
  3. 124“NI-DAQmx”VI
- 1.
  2. VI

## U

USB //USBNI USB-9201NI USB-9211NI USB-9215NI  
DAQ USB-9221NI USB-9233NI USB-9237USB DAQ

**V**

V

VI

VISA (Virtual Instrumentation Software Architecture)

**W**

WDT

I/O I/O

X

9010

88

(TTL)

LabVIEW

I/O I/O

Y

- 1.
2. VI

DAQ



**Z**

(dB)

TEDS EEPROMTEDS

ADC

NI-DAQmx™/VI

I/OPCISAPCI

NI

90National InstrumentsNational InstrumentsNational  
Instruments

(RMA)National Instruments

National InstrumentsNational InstrumentsNational  
InstrumentsNational Instruments

**National InstrumentsNational InstrumentsNational  
Instruments**

InstrumentsNational InstrumentsNational Instruments

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	1800 300 800
	43 662 457990-0
	32 (0) 2 757 0020
	55 11 3262 3599
	800 433 3488
	86 21 5050 9800
	420 224 235 774
	45 45 76 26 00
	358 (0) 9 725 72511
	33 (0) 1 57 66 24 24
	49 89 7413130
	91 80 41190000
	972 0 3 6393737
	39 02 41309277
	0120-527196 / 81 3 5472 2970
	82 02 3451 3400
	961 (0) 1 33 28 28
	1800 887710
	01 800 010 0793
	31 (0) 348 433 466
	0800 553 322
	47 (0) 66 90 76 60
	48 22 3390150
	351 210 311 210
	7 495 783 6851
	1800 226 5886
	386 3 425 42 00
	27 0 11 805 8197
	34 91 640 0085

	46 (0) 8 587 895 00
	41 56 2005151
	886 02 2377 2222
	662 278 6777
	90 212 279 3031
	44 (0) 1635 523545
	512 683 0100