

SOFTWARE UTILITY USER MANUAL

MODEL 3165

PUBLICATION NO. 980899-003

RACAL INSTRUMENTS

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<http://www.racalstruments.com/downloads>

If you have any questions about software driver downloads or our privacy policy, please contact us at

info@racalstruments.com.

WARRANTY STATEMENT

All Racal Instruments, Inc. products are designed and manufactured to exacting standards and in full conformance to Racal Instruments ISO 9000/2000 procedures.

For the specific terms of your standard warranty, or optional extended warranty or service agreement, contact your Racal Instruments customer service advisor. Please have the following information available to facilitate service.

1. Product serial number
2. Product model number
3. Your company and contact information

You may contact your customer service advisor by:

E-Mail:	Helpdesk@racalstruments.com	
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RETURN of PRODUCT

Authorization is required from Racal Instruments before you send us your product for service or calibration. Call your nearest Racal Instruments support facility. A list is located on the last page of this manual. If you are unsure where to call, contact Racal Instruments, Inc. Customer Support Department in Irvine, California, USA at 1-800-722-3262 or 1-949-859-8999 or via fax at 1-949-859-7139. We can be reached at: helpdesk@racalstruments.com.

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FOR YOUR SAFETY

Before undertaking any troubleshooting, maintenance or exploratory procedure, read carefully the **WARNINGS** and **CAUTION** notices.



CAUTION
RISK OF ELECTRICAL SHOCK
DO NOT OPEN



This equipment contains voltage hazardous to human life and safety, and is capable of inflicting personal injury.



If this instrument is to be powered from the AC line (mains) through an autotransformer, ensure the common connector is connected to the neutral (earth pole) of the power supply.



Before operating the unit, ensure the conductor (green wire) is connected to the ground (earth) conductor of the power outlet. Do not use a two-conductor extension cord or a three-prong/two-prong adapter. This will defeat the protective feature of the third conductor in the power cord.



CAUTION
SENSITIVE ELECTRONIC DEVICES
DO NOT SHIP OR STORE NEAR
STRONG ELECTROSTATIC,
ELECTROMAGNETIC, MAGNETIC OR
RADIOACTIVE FIELDS

Maintenance and calibration procedures sometimes call for operation of the unit with power applied and protective covers removed. Read the procedures and heed warnings to avoid “live” circuit points.

Before operating this instrument:

1. Ensure the proper fuse is in place for the power source to operate.
2. Ensure all other devices connected to or in proximity to this instrument are properly grounded or connected to the protective third-wire earth ground.

If the instrument:

- fails to operate satisfactorily
- shows visible damage
- has been stored under unfavorable conditions
- has sustained stress

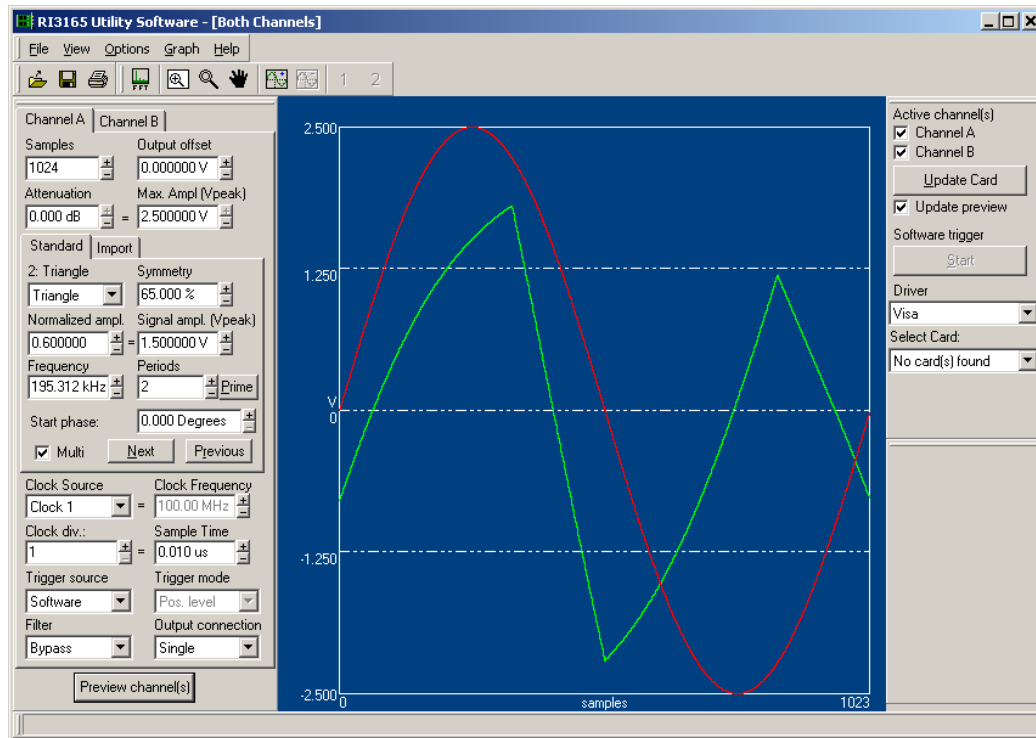
Do not operate until performance is checked by qualified personnel.

TABLE OF CONTENTS

General	6
Load and Save Instrument Configuration	6
Adjusting The Instrument	7
Standard Signals	9
Import Signals	9
Decimal Import Data	10
Hexadecimal Import Data (instrument main-DAC codes)	10
Updating The Instrument	11

General

The RI3165 Software Utility (980899-003) default has the following layout:



The instrument's configuration can be changed with the settings in the left panel. By pressing the button "Preview channel(s)" the signal configuration will be displayed in the graph. Depending on the setting "Active channel(s)" in the right panel, the graph will display channel A, B or both (or none).

For more details about the Instrument Settings see "Adjusting The Instrument". For more detail about the right panel (Instrument Update) see "Updating The Instrument".

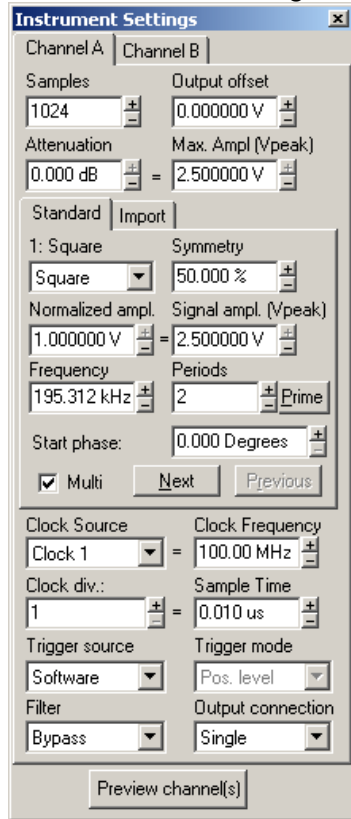
The default unit for the X-axis is samples. For a comparison in time domain the X-axis unit can be set to time. Select Options->Time Domain Settings to configure this setting.

Load and Save Instrument Configuration

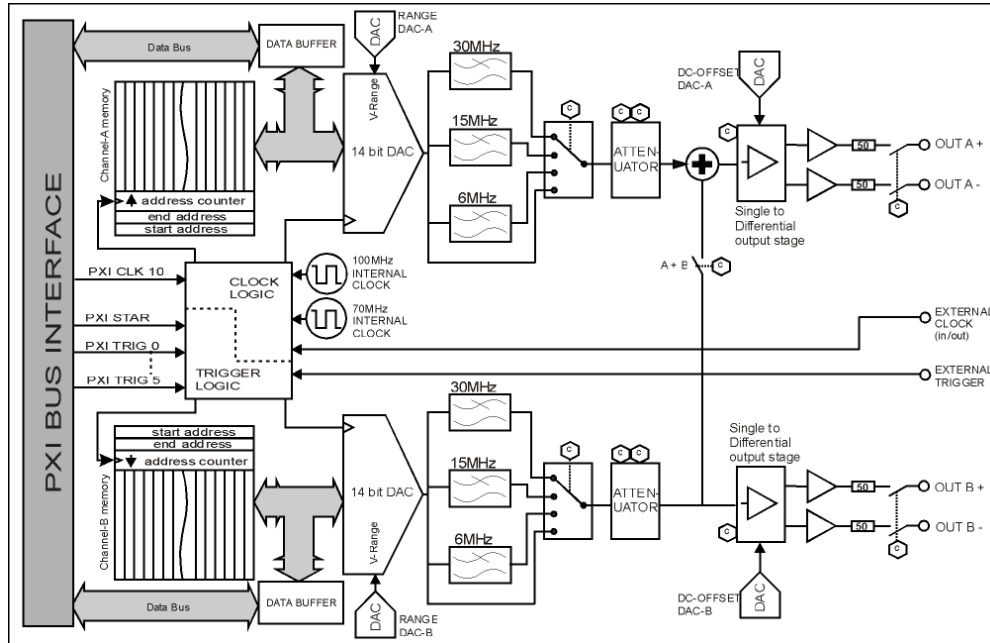
The instrument configuration can be saved to disk. Select File->Save Settings. For loading a previous saved file select File->Load Settings. The default settings are save in the file "RI3165.set". Do not overwrite this file.

Adjusting The Instrument

The instrument settings can be adjusted with the following panel:



It is easier to understand the settings if the hardware structure is known:



3165 Functional Block Diagram

The instrument can be configured by adjusting the following parameters:

- **Samples:** Number samples for the signal. If the signal is imported from a file the number of samples is determined by the file and cannot be altered.
- **Output offset:** This parameter will program the DC-Offset dac (see block diagram).
- **Attenuation:** The attenuator does change the following hardware elements:
 - The attenuator for the 3 dB step;
 - The Range DAC (close to the 14 bit main dac) for the attenuation between the 3 dB steps
- **Max. Ampl. (Vpeak):** This indicates the maximum possible output voltage. The attenuator determines the maximum amplitude (Vpeak). Changing this parameter will change the attenuator and determine the signal amplitude (see also “Standard Signals”).
- **Standard and Import:** The signal definition. See “Standard Signals” and “Import Signals” for more information.
- **Clock Source:** Select the desired clock source. If the front clock source is selected, the clock frequency can be altered. This is useful for a correctly calculated frequency and sample time.
- **Clock Frequency:** Only adjustable if the front clock is selected. This value will only influence the calculated frequency.
- **Clock div.:** The clock divider divides the Clock Source and determines the sample frequency.
- **Sample time:** The sample time can be adjusted by changing the clock divider. If this value is changed press “enter” to update the clock divider value (and the corresponding sample frequency).
- **Trigger Source:** Select the desired trigger source. See “Updating The Instrument” for how to send a software-trigger if “Software” is selected as source.
- **Trigger Mode:** The trigger mode is adjustable if the trigger source isn't set to software. The following modes are available:
 - Positive level: Signal will run if trigger source has a logic high level
 - Negative level: Signal will run if trigger source has a logic low level
 - Positive edge re-trigger: Signal will run after the first positive edge. The next positive edge will stop the signal running.
 - Negative edge re-trigger: Signal will run after the first negative edge. The next negative edge will stop the signal running.
 - Positive edge continuous: Signal will run after a positive edge
 - Negative edge continuous: Signal will run after a negative edge
- **Filter:** Select a filter or just bypass the filters.
- **Output connection:** Connect the output single ended or differential. Channel B can be added (inversed) to channel A (single ended or differential).

Press “Preview channel(s)” to update the graph.

Standard Signals

The standard signal can be configured by the following parameter:

- **Signal shape:** There are three standard shapes:
 - Sine
 - Square
 - Triangle
- **Symmetry:** For a square wave the symmetry parameter will change the duty cycle. For a triangle the symmetry will change the top of the triangle. 0% will result in a falling ramp, 100% in a rising ramp.
- **Normalize amplitude:** A value between -1 and +1. This parameter will adjust the signal amplitude. A value of 1 means a (main) DAC utilization of 100% (the DAC will get the maximum possible code) and the signal amplitude is equal to the settings "Max. amplitude". A value of 0.5 corresponds with 50% DAC utilization.
- **Signal Ampl. (Vpeak):** The amplitude of the signal (Vpeak). The signal amplitude is influenced by the normalized amplitude and the attenuator setting. The maximum possible value of the signal amplitude is equal to the setting "Max. amplitude". A value below "Max. amplitude" means the (main) DAC utilization is less than 100%.
- **Frequency:** The frequency of the signal. The frequency is calculated with:
$$f = p/N * fs$$
where :
 - f = signal frequency
 - p = number of periods
 - N = number of samples
 - fs = sample frequency
- **Periods:** Number of period for the signal. Changing the periods will change the frequency.
- **Start phase:** The start phase of the signal.
- **Multi:** Check multi for adding signals. This will allow you to create shapes other than the three standard shapes. Press the next button to define a new signal that will be added to the already configured signal(s). Press the previous button to go back to a previous declared signal.

Import Signals

For more flexibility the software can import signals created in other applications. Signal files are text files with one column containing decimal or hexadecimal data, see next paragraphs for more details. The number of lines will determine the number of samples. Press the Browse button to select a signal file. The folder "Signals" of the application folder contains several examples of signal files.

Decimal Import Data

The decimal import data has the following format:

0.123
1.0
-0.3
etc.

A value of 1 will result in an amplitude of “Max. amplitude” (determined by the attenuator).

The imported data can be multiplied with any value.

Hexadecimal Import Data (instrument main-DAC codes)

The hexadecimal import data has the following format:

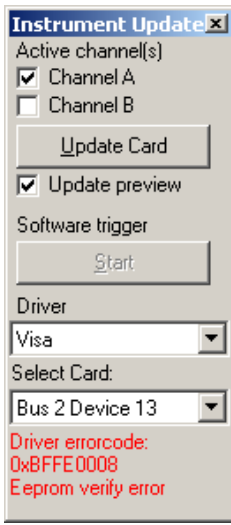
3000
4F5
5e2
100a
etc.

The instrument does have a 14 bit DAC (see block diagram). The import data will program this DAC, so the data can be in a range from 0 to 3FFF.

The imported data can be multiplied with any value.

Note: left shifting is equal to multiplying with 2, 4, 8 etc, for right shifting multiply with 0.5 , 0.25 , 0,125 etc.

Updating The Instrument



This panel is used to update and select the card. It does have the following items:

- **Active channel(s):** Select the channel(s) to be updated.
- **Update Card:** Send the (changed) Instruments settings to the hardware. Only the active channel(s) will be updated.
- **Update preview:** The graph will also be updated with a card update if this item is checked.
- **Software trigger:** Send a software trigger to the instrument. Button is only enabled is card is updated and “Software” is selected to be the trigger source.
- **Driver:** Select the driver that is being used (VISA or VISA kernel driver)
- **Select card:** Select the card to be updated. If using the VISA driver, use NI-MAX to locate the card. If using the kernel driver, use the Windows Device Manager.
- **Status:** Display the driver error code if any.

Product Support

Racal Instruments has a complete Service and Parts Department. If you need technical assistance or should it be necessary to return your product for repair or calibration, call 1-800-722-3262. If parts are required to repair the product at your facility, call 1-949-859-8999 and ask for the Parts Department.

When sending your instrument in for repair, complete the form in the back of this manual.

For worldwide support and the office closes to your facility, refer to the Support Offices section on the following page.

Warranty

Use the original packing material when returning the 3165 (980899-003) to Racal Instruments for calibration or servicing. The original shipping container and associated packaging material will provide the necessary protection for safe reshipment.

If the original packing material is unavailable, contact Racal Instruments Customer Service for information.

Support Offices

RACAL INSTRUMENTS

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REPAIR AND CALIBRATION REQUEST FORM

To allow us to better understand your repair requests, we suggest you use the following outline when calling and include a copy with your instrument to be sent to the Racal Instruments Repair Facility.

Model _____ Serial No. _____ Date _____

Company Name _____ Purchase Order # _____

Billing Address _____
City _____

State/Province _____ Zip/Postal Code _____ Country _____

Shipping Address _____
City _____

State/Province _____ Zip/Postal Code _____ Country _____

Technical Contact _____ Phone Number () _____

Purchasing Contact _____ Phone Number () _____

1. Describe, in detail, the problem and symptoms you are having. Please include all set up details, such as input/output levels, frequencies, waveform details, etc.

2. If problem is occurring when unit is in remote, please list the program strings used and the controller type.

3. Please give any additional information you feel would be beneficial in facilitating a faster repair time (i.e., modifications, etc.)

4. Is calibration data required? Yes No (please circle one)
Call before shipping Ship instruments to nearest support office.
Note: We do not accept
"collect" shipments