MetLogix

# *Gx200 Setup Guide*

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# Gx200

## *Setup Guide*

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# Introduction

The Gx200 Setup Guide describes the operation of the Gx200 digital readout. While it is likely that this guide includes some material that doesn't apply to your specific Gx200 digital readout system, the concepts explained here can easily be applied to all Gx200 digital readouts.

The concepts explained in this guide are necessary for the operation of any Gx200 digital readout. Operators and supervisors will find the contents invaluable in conducting measurements, designing automatic functions, and reporting results. A few user setup functions are also described that will help users and supervisors customize the Gx200 measurement tools, user interface screens and reporting capabilities.

# Prerequisites

Operators and supervisors are assumed to understand gaging and dimensional metrology theories and practices.

# Conventions & Terms

The term "Gx200" refers to the Gx200 digital readout and the measuring hardware connected to it.

# Icons

This guide uses the following icons to highlight information:

***CAUTIONS & IMPORTANT INFORMATION***

***The exclamation point icon indicates important information regarding equipment operation or maintenance, or a situation or condition that can lead to equipment malfunction or damage. Do not proceed until the information is read and thoroughly understood.***

***NOTE***

***The question mark icon indicates important supplementary information about an activity or concept.***

# Getting Help

Help is available in this guide, in the electronic version of this guide accessed from the Help menu (question mark icon) of the System toolbar, from your MetLogix distributor or system provider and from our product support page at www.metlogix.com.

Should it become necessary to contact your MetLogix distributor or system provider, be prepared to supply the following information:

- The Gx200 software version number, found in the About Settings screen accessed through the Gx200 System menu (Gx200 logo in the System toolbar).
- Information describing the measuring system hardware which can be found in the channel screen in setup.
- A detailed description of the problem and the steps that you've taken to resolve it.

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# Section 1: System Overview

The Gx200 is an advanced gaging digital readout for performing gaging measurements at very high levels of precision and accuracy. Measurements can be performed using specially designed gages or general purpose gages as part of prototype development, in-line production or final quality inspection.

User interactions with the software are through the color touchscreen or using softkeys and function keys on the rubberized keypad.

The Gx200 provides powerful features for that are optimal for gaging. These includes:

- **Support for different channel inputs**
  The Gx200 supports analog and digital encoders, LVDT and A2E inputs.
- **Sophisticated formula design**
  The sophisticated formula editor can be used to design formulas that address any measurement sequence by combining the channel inputs and mathematical functions.
- **Graphical prompting**
  The operator is image-guided to probe specific points on the artifact under measure.
- **Wireless configurations and data transfers**
  The system can be configured wirelessly using the companion GxLink computer program. This application program can also be used to transmit data wirelessly from the readout.

# Getting Started

The following sections will describe the package contents, readout specifications, mounting options, and basic hardware connections for the Gx200.

## Shipping Contents

The following components are part of your Gx200 digital Readout kit:

1. Gx200 Device.
2. Machine mounting option (ball, block, and/or stand)
3. Power supply module and line cord (US 2-line).

***NOTE***
***It may be helpful to save the Gx200 packaging in the event the device needs to be returned to the manufacturer for repair or requires transport to a new location.***

***Gx200 Specifications***

**Display:** 7" Color 1024 X 600 LCD, with an LED backlit capacitive touch screen.
**Power:** Power supply (included): 100-240VAC, 50/60Hz, 3.0A. Power Input to Gx200: 12V.
**Agency Approvals:** CE
**DRO Dimensions:** 286mm wide x 51mm deep x 162mm high
**DRO Baseplate Dimensions:** 120mm wide x 125mm deep x 9.5mm high

## Hardware Installation and Connections

It is important that the Gx200 device is operated from a secure and rigid mounting location. While the supplied MetLogix mounting hardware may serve as an adapter piece toward that installation, it is the installation technicians' responsibility to ensure complete and safe installation of the device. Select the appropriate mounting method:

### ***Mounting Options***

**OEM mount:** Two *Riser Blocks* providing up to 4 distinct viewing angles, using (2) M6 threaded holes, spaced 38mm.
**RAM ball mount:** One *Riser Block* with 1.5" RAM Ball.
**Base plate:** Base Plate with two *Riser Blocks* providing up to 4 distinct viewing angles from the base.

### ***OEM Mount***

Using a 3MM Allen wrench and the supplied M6 screw, connect the riser block to the opening on the rear panel of the Gx200. The hole spacing is 38MM with a ¼"-20 thread pattern. Screws required to connect the OEM mount to the machine mount are not included in the Gx200 mounting kit.

### ***Ball Mount (1.5" Ball)***

Using a 3MM Allen wrench and the supplied M6 screw, connect the riser block/ball mount module to the opening on the rear panel of the Gx200.

### ***Base Mount Installation:***

Using a 3MM Allen wrench and the supplied M6 screw, connect the riser block to the opening on the rear panel of the Gx200.
Using a 4MM Allen wrench and the (2) supplied M6 screws, connect the supplied stand to the riser block.

- Complete the Gx200 readout installation according to the recommended mounting technique for the measuring system being used.
- For standard benchtop installations place the Gx200 readout on a flat stable surface within reasonable operating distance from the measuring system.

## Power Connection

Attach the supplied 12V (Positive Tip) power supply connector to the power input port on the Gx200 readout. Connect the supplies 2-wire line cord cable to a stable 110/220 AC power source.

### *CAUTIONS & IMPORTANT INFORMATION*

***The Gx200 digital readout is NOT designed to be powered off instantaneously by removal of the power supplied to the unit. As such the power supply to the Gx200 should be connected directly to a power source, and not to an intermediary power switch. To power off the Gx200 correctly, press the power button on the front keypad and press the "Power Off" button displayed at the right side of the main Gx200 screen.***

### *Channel Connections*

The Gx200 is designed to accept 2, 4, or 8 channel inputs from encoders (analog or TTL type encoders), LVDT and A2E. It is critically important that the correct signals be connected between the channel and the Gx200 to avoid damage to the Gx200 and/or the channel input. Please ensure that the channel connections to the Gx200 have been verified as compatible by an authorized MetLogix OEM prior to installation.

1. Ensure that the Gx200 is powered off prior to connecting any channels.
2. Locate channel terminations from the measuring system and connect them to the channel inputs on the back of the Gx200.

### *NOTE*

***Secure all encoder connections tightly to the standoffs at the input connector to ensure complete communication between the encoder and the Gx200.***

### *USB, GPIO, Footswitch-In/Serial-Out, & COM Port Connections*

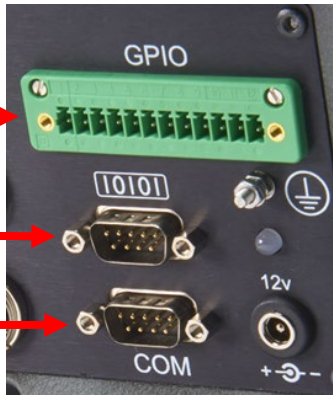
The Gx200 is equipped with a USB port, a GPIO, a Footswitch-In/Serial-Out, and a 9-pin Com port (for use with serial channel(s)).

- The USB port is used for USB supported functions.
- The GPIO is used for Digital-In/Digital-Out functions.
- The Footswitch-In/Serial out port is used to connect a footswitch and/or serial output ONLY using a special MetLogix adapter.
- The COM port is used for connecting serial channels.

GPIO

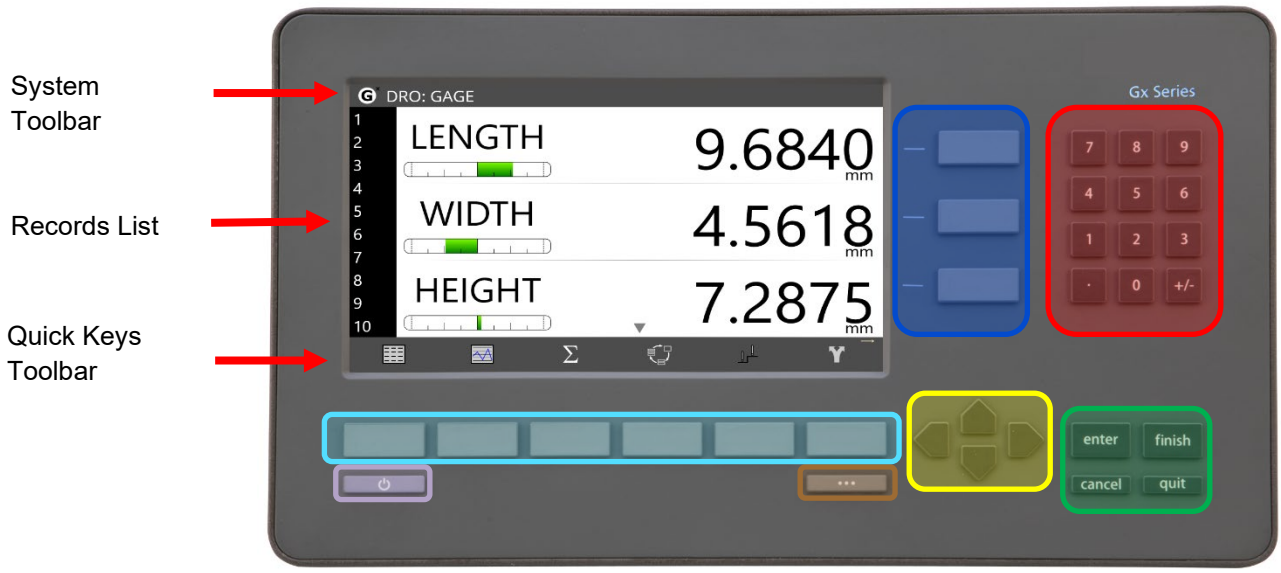
Footswitch-In/ Serial-Out

COM Port



# User Interface

The Gx200 digital readout interface consists of a records list, dimensions display, and toolbars. Interacting with the unit can be done via the color touchscreen, keypad, Bluetooth, or remotely via GxLink.




| Keys | Function |
|---|---|
| Number Pad | Enter numeric digits, decimal points, and sign (+/-) into the current field. |
| Command Keys | Enter – Enters a data record or selects a setup menu item.<br>Finish – Exit current display view or confirms selected setup menu item.<br>Cancel – Deletes selected record(s) or formula item.<br>Quit – Exit the current screen back to the top-level settings screen or home screen. |
| Arrow Keys | Navigate the settings menu screens, data records and view screens. |
| Power Key | Single Press to Power On. When On, Single Press for Screen Off, Long Press for Power Off. |
| Soft Keys (1-6) | Executes the softkey button commands/selection displayed above the key. |
| DRO Keys | Switches dimensions in formula editor screen. Switches views while in DRO mode. |
| Menu Button | Displays or advances the Softkey Menu. |

## Screen Organization

The primary screens of the software interface are:

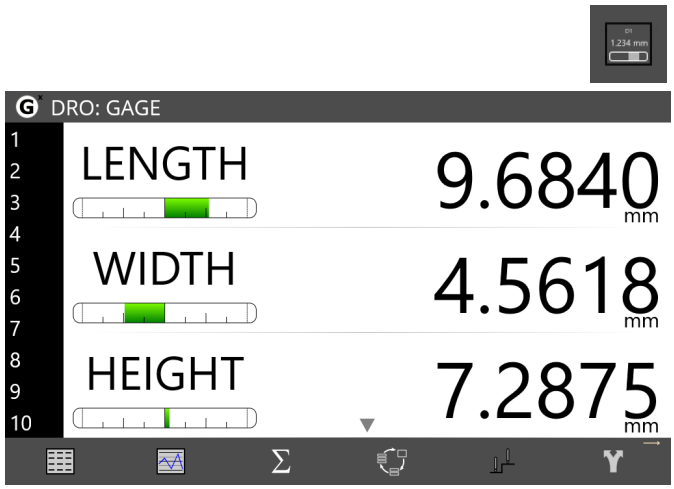
- DRO (Home screen)
- Data View screen
- Graph View screen
- Stats View screen
- Setup screens

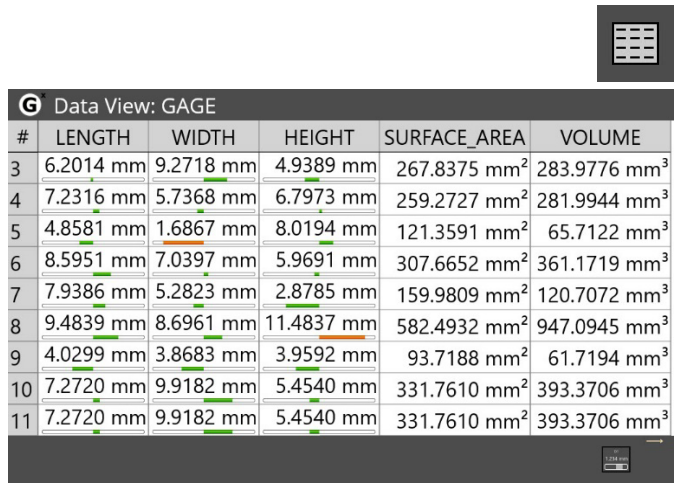
The system toolbar displays the title and part name while the quick keys toolbar displays the mapped action buttons.

## ***DRO, Data view screen***

The default display of the DRO is shown below. The part dimensions are displayed in the main DRO space. The dimension information includes name and current value. It may also include gages, units, and sequence numbers. The data records are displayed on the left side of the screen.

The Data view screen shows all the data that has been saved for a part. The information displayed includes dimension names, record numbers, dimension data and units of measure for each dimension.



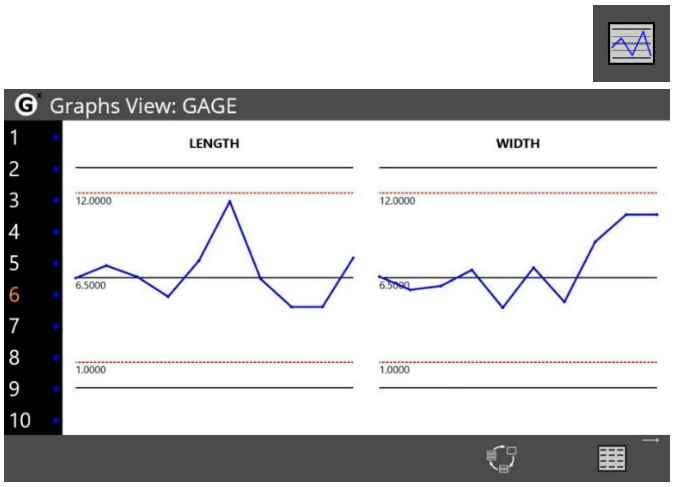
Data View: GAGE

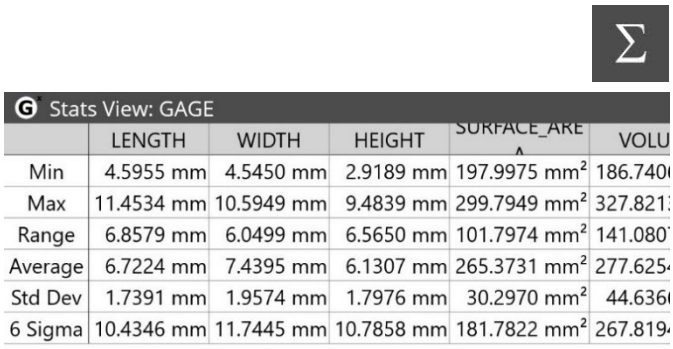
| # | LENGTH | WIDTH | HEIGHT | SURFACE_AREA | VOLUME |
|---|---|---|---|---|---|
| 3 | 6.2014 mm | 9.2718 mm | 4.9389 mm | 267.8375 mm² | 283.9776 mm³ |
| 4 | 7.2316 mm | 5.7368 mm | 6.7973 mm | 259.2727 mm² | 281.9944 mm³ |
| 5 | 4.8581 mm | 1.6867 mm | 8.0194 mm | 121.3591 mm² | 65.7122 mm³ |
| 6 | 8.5951 mm | 7.0397 mm | 5.9691 mm | 307.6652 mm² | 361.1719 mm³ |
| 7 | 7.9386 mm | 5.2823 mm | 2.8785 mm | 159.9809 mm² | 120.7072 mm³ |
| 8 | 9.4839 mm | 8.6961 mm | 11.4837 mm | 582.4932 mm² | 947.0945 mm³ |
| 9 | 4.0299 mm | 3.8683 mm | 3.9592 mm | 93.7188 mm² | 61.7194 mm³ |
| 10 | 7.2720 mm | 9.9182 mm | 5.4540 mm | 331.7610 mm² | 393.3706 mm³ |
| 11 | 7.2720 mm | 9.9182 mm | 5.4540 mm | 331.7610 mm² | 393.3706 mm³ |

## ***Graph view screen, Stats view screen***

The Graph view screen displays the dimensional data graphs. These graphs are continually updated in real time as more data records are entered into the database. The data records are displayed on the left side of the screen.

The Stats view screen displays the statistical analysis for all data records of each dimension in a part's database. The data values shown may include the minimum, maximum, range, average standard deviation and six sigma.



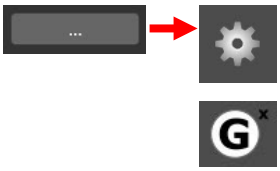
Stats View: GAGE

| | LENGTH | WIDTH | HEIGHT | SURFACE_ARE | VOLU |
|---|---|---|---|---|---|
| Min | 4.5955 mm | 4.5450 mm | 2.9189 mm | 197.9975 mm² | 186.740 |
| Max | 11.4534 mm | 10.5949 mm | 9.4839 mm | 299.7949 mm² | 327.821 |
| Range | 6.8579 mm | 6.0499 mm | 6.5650 mm | 101.7974 mm² | 141.080 |
| Average | 6.7224 mm | 7.4395 mm | 6.1307 mm | 265.3731 mm² | 277.625 |
| Std Dev | 1.7391 mm | 1.9574 mm | 1.7976 mm | 30.2970 mm² | 44.636 |
| 6 Sigma | 10.4346 mm | 11.7445 mm | 10.7858 mm | 181.7822 mm² | 267.819 |

## ***Setup***

Setup screens are used in the configuration of the unit. Apart from a few screens that may be changed by the user for convenience, the Setup screens are designed to be used by gaging system manufacturers or system supervisors. A high degree of attention needs to be observed when changing the default configurations of the system.

To access the Setup screens, repeatedly press the Menu button until the Setup button is shown in the Quick keys' toolbar. Then press the associated softkey or touch the button once. The Setup screens can also be accessed quickly via the logo button.






## Menu Button

A screen or a field may have associated softkeys that perform different functions. The softkeys are displayed six at a time. Availability of more than six softkeys is indicated by a small arrow on the rightmost or leftmost softkey. To access the next set of softkeys, press the menu key.

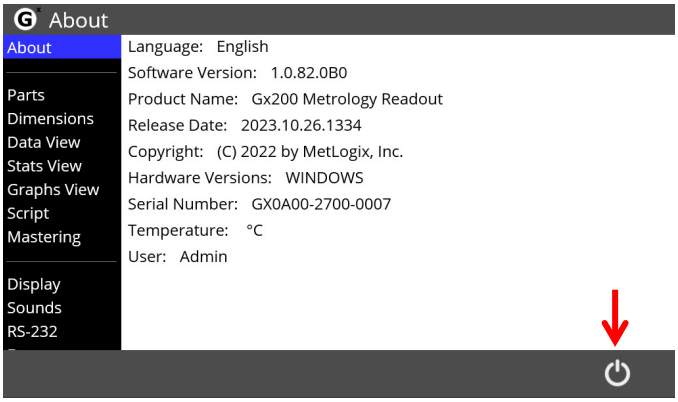
# Section 2: Setup

Setup screens are grouped into five categories, according to level of complexity and type of use. The five categories are About, Parts, IO, Channels and System. The first three categories (About, Parts and IO) can be configured by the operator. The Channels and System sections are recommended to be configured only by an OEM or system administrator. The Parts category consists of the Parts, Dimensions, Data view, Stats view, Graphs view, Script, and Mastering screens. The IO category includes Display, Sounds, RS-232, Export, Printouts, GPIO, and Quick Keys screens. The Channel category consists of Channels, Sets, and Globals screens. The last category, System, includes Security, System, and Factory screens.

## About

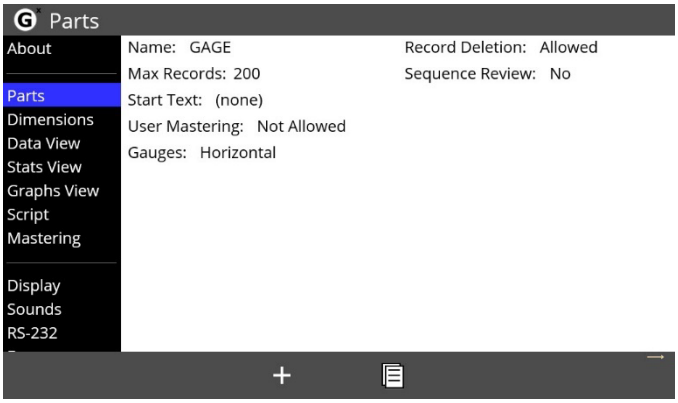
About screen contains general information about the system. This includes:

- *Language* – Can be changed to any of the supported languages.
- *Other system information* – This information is read-only.
- *Power button* – The power button can be used to power down the unit.




## Parts

A Part is made up of a set of measuring information. It describes a set of data to be measured and the steps (or a sequence) of measurements to acquire that data. In essence, a Part is a program-like structure that contains all the ingredients for a successful measurement of an artifact. The Parts screen in the Parts category defines the identifying information of the part while the subsequent screens add details to it. This information includes:




- *Name* – Name of the part.
- *Max Records* – The maximum number of data records that will be contained in the part. Once this maximum number is reached, additional data records are added to the bottom of the list while records at the top of the list are deleted.
- *Start Text* – This is message that gets displayed whenever this part is loaded.
- *User Mastering* – This field sets the permissions for allowing an operator to master (preset channel values used in this part).
- *Gages* – Supported gages include horizontal, vertical, dial and graphic. The default is None.
- *Record Deletion* – This field set permission to allow deletion of records or strikethrough (where the record is retained but excluded from any part transaction).
- *Sequence Review* – For a part that uses a sequence data collection mechanism, this field enables/disables the ability to show all the collected data to the operator before saving it to the part database.

## Dimensions

Dimensions screen is used to set up the measurement information to be collected and how to perform the measurements. A group of dimensions in the part make up a data record. Each dimension contains one data item in the record. The fields in this screen are:

- *Name* – Name of the of the dimension.
- *Show in DRO* – Enables/disables the showing of the dimension on the DRO view.
- *Show in Data view* – Enables/disables the showing of this dimension in the data view. If this field is set to *No*, data from this dimension is not included in the part record.
- *Sequence #* – When this is set to an integer other than 0, the dimension formula will be evaluated when the operation steps reach that number in the sequence.
- *Type* – Defines the type of dimension: *Formula* or *Class*.

The Formula type includes additional fields:

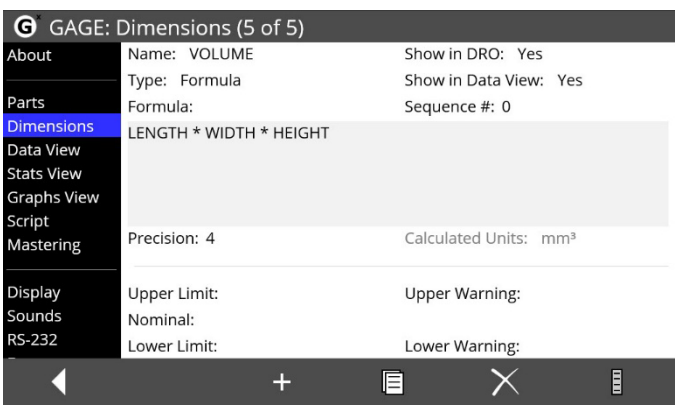
- *Formula* – Used to enter the formula to be evaluated for this dimension.
- *Precision* – Used to set the number of decimal places.
- *Calculated Units* – This field displays the units for the dimension. These units represent the resultant units of evaluating the formula entered in the Formula field.
- *Tolerances* – Fields for entering tolerance values for the dimension.

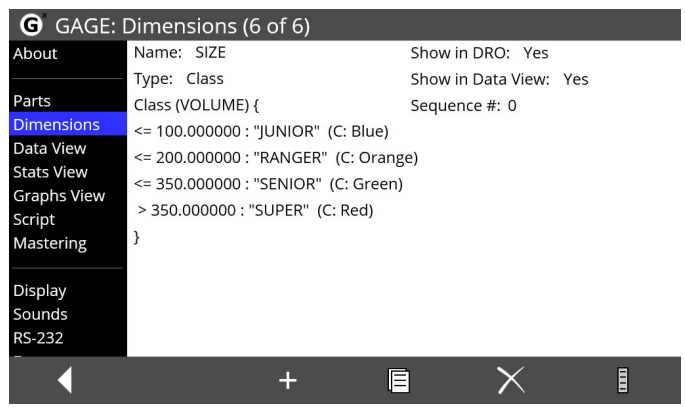
The Class type includes additional field:

- *Class* – Defines the class type and display properties.

## Data, Stats and Graphs Views

The Views setup screens provide a way to control the type of information to be included in each view. The controls can be set during the part definition or changed during the process of part measurements.



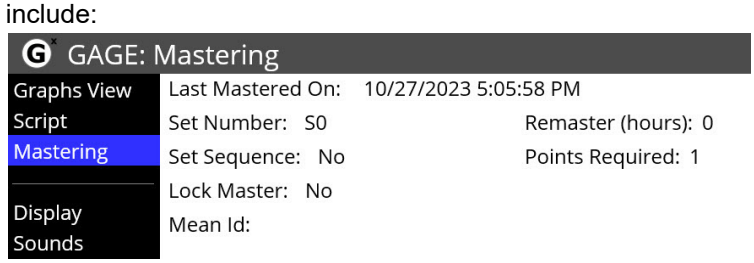

## Script

Part Script is a set of formulas that are evaluated to support the part dimensions. Formulas used in the script typically are used for part preparation, measurement guidance and IO communication.

## Mastering

Mastering provides a way to preset channels to a specific desired value. The channels to be mastered are configured in the Sets screen. The fields in the Mastering screen include:

- *Last Mastered On* – This field displays the date and time that a master operation for this part was performed.
- *Set Number* – The name of the Set assigned to this part. The Set numbers are configured in the Sets screen.



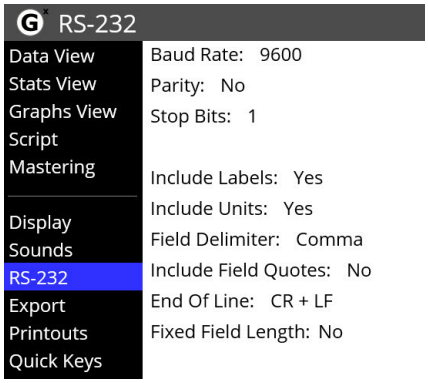
- *Set Sequence* – Enables/disables the performing of the master operation in a sequence fashion, where a channel or (group of channels) are mastered one at a time.
- *Lock Master* – Enables/disables the mastering operation for this part for a user of type operator.
- *Mean* – Can enter an ID for the master operation.
- *Remaster (hours)* – Prompts for the mastering operation to be performed once the set time has elapsed.
- *Points Required* – Sets the number of times the ENTER key must be pressed for each master operation to be successful.

## Display and Sound

Display screen provides fields to set the degrees display (dms or dd), angle range, radix (period or comma), and record height. Sound screen is used to set the keypress beep length. This controls the sound produced when keys on the rubberized keypad are pressed. The options provided are disabled, chirp, short and long.

## RS-232

The RS-232 screen is used to set up the parameters for serial communication. The screen can also be used to configure the information sent and its format. The RS-232 port requires a special adapter cable as it is also used to support footswitch connection. The fields in the RS-232 screen include:




- *Baud Rate, Parity, and Stop Bits* – The baud rate, parity and stop bits are the RS-232 communication settings that must correspond to the values set on the receiving computer.
- *Include Labels* – Enables/disables inclusion of dimension labels in the RS-232 data stream.
- *Include Units* – Enables/disables inclusion of dimension units in the RS-232 data stream.
- *Field Delimiter* – The delimiter for values in a record.
- *Include Field Quotes* – Enables/disables inclusion of quotes for each individual data item.
- *End Of Line* – Sets the character(s) that indicates the end of a line (record) in the data stream.
- *Include Labels* – Enables/disables inclusion of dimension labels in the RS-232 data stream.
- *Fixed Field Length* – The value entered in this field sets the number of characters that can be contained in a data field. The range is 0-20 (where 0 turns off this restriction and sets this field to *No*)

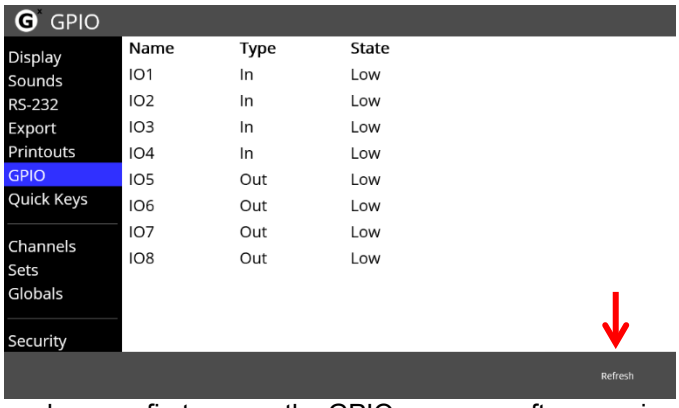
The general purpose IO port that supports RS232 has the following pinout:

| Gx200 9 Pin Dsub (F) | Description | Switch Device (Footswitch/Buttons/ETC) | RS232 9 Pin Dsub (M) |
|---|---|---|---|
| 1 | TRIG_2_IN | SW2 Common | NC |
| 2 | RX_IN | | 2 |
| 3 | TX_OUT | | 3 |
| 4 | TRIG_1_OUT | | NC |
| 5 | GND | SW1 & SW2 (Normally Open) & Earth Ground | 5 |
| 6 | TRIG_1_IN | SW1 Common | NC |
| 7 | TRIG_3_IN | | NC |
| 8 | TRIG_2_OUT | | NC |
| 9 | TRIG_3_OUT | | NC |

## Export and Printouts

The Export and Printout screens can be used to set the location to export data to, the format and included data items. Data can be exported wirelessly using the companion GxLink PC application or to USB flash drive. It can also be sent to a wireless printer.

## GPIO




The General Purpose Input Output (GPIO) is the port with 8 input/output lines that can be used for communicating with an external device that takes in or sending out a 0 or a 1. Each line can be set to either send/receive the two bits (0 or 1). The state column shows if a particular line is sending/receiving a 0 (low) or a 1 (high). The GPIO is a factory enabled option. The columns in this screen are:

- *Name* – Name of the IO line. Looking at the port from the back, IO1 is the leftmost line.
- *Type* – Sets the IO line either to send (*Out*) or to receive (*In*). The default is *In*.
- *State* – Shows the what the line is sending or receiving when you first access the GPIO screen or after pressing the **REFRESH** button.
- *Refresh button* – Refreshes the current state of the IO lines.

## Quick Keys

Quick keys provide a way to access frequently used functions such as displaying data and graphs views. Keys can be mapped to softkeys, number pad, DRO buttons and a footswitch. The following functions can be mapped:

| Function | Button Icon | Description |
|---|---|---|
| Master | | Presets the channels to a nominal value or changes the channel resolution. |
| Master Set | | Quickly presets the channels to a nominal value. *Can be mapped for a set of mastering type* Mean *only*. |
| Stats View | | Toggles between the Stats and DRO views. |
| Graphs View | | Toggles between the Graphs and DRO views. |
| Data View | | Toggles between the Data and DRO views. |
| Zoom | | Cycles the current view from one dimension view, up to six dimension views. |
| Send Dimension | | Transmits the mapped dimensions data to a receiving computer via the serial port. |
| Send Record | | Transmits the selected record(s) to a receiving computer via the serial port. Will send last record in the list if no record is selected. |

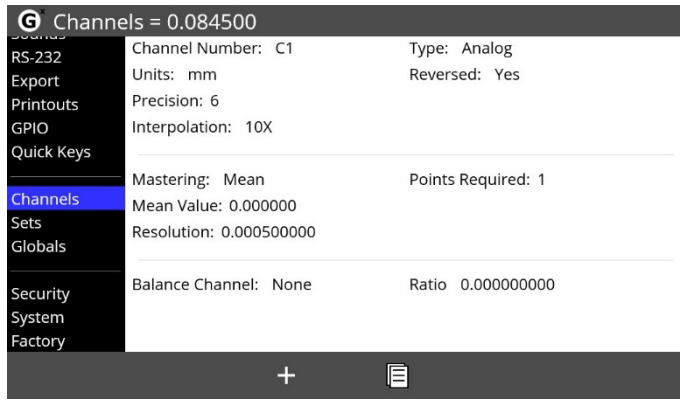
| | | |
|---|---|---|
| Send All Records | Send All Records | Transmits all records to a receiving computer via the serial port. |
| Export Records | | Exports all records either wirelessly or to inserted USB flash drive. |
| Print | | Sends data to the wireless printer. |
| Setup | | Takes you to the Setup screens. |
| Trigger | Trigger Trig1 | Sets the assigned trigger value to true. |
| Reset Dyn | Reset Dyn | Resets the dynamic min, max and latch-at functions. |
| Load Part | Load P1 | Loads the assigned part to be current. |
| Logout | | Logs out the current user. |
| Help | ? | Brings up this guide (Setup Guide). |
| dms/dd | dms dd | Toggles between Degrees Minutes Seconds and Decimal Degrees modes. |
| mm | mm Inch | Toggles between millimeter and inch modes. |
| Enter | Enter | Used as the Enter key. *Can be mapped to a footswitch button only.* |
| Finish | Finish | Used as the Finish key. *Can be mapped to a footswitch button only.* |
| Cancel | Cancel | Used as the Cancel key. *Can be mapped to a footswitch button only.* |
| Quit | Quit | Used as the Quit key. *Can be mapped to a footswitch button only.* |

# Channels

Channels are inputs from measurement probes to the Gx200 units. Up to 8 channels can be physically connected to the Gx200. The Gx200 supports these types of probes: encoded, LVDT-type and Air-to-Electric (A2E).

## *Encoded*

Encoded probes use encoded scale with a reader header for generating measurement data. There are two signal types for the encoded probes: analog and digital. Both follow the same configuration process. Analog has an additional field for setting the interpolation. The fields in encoded channel type are:

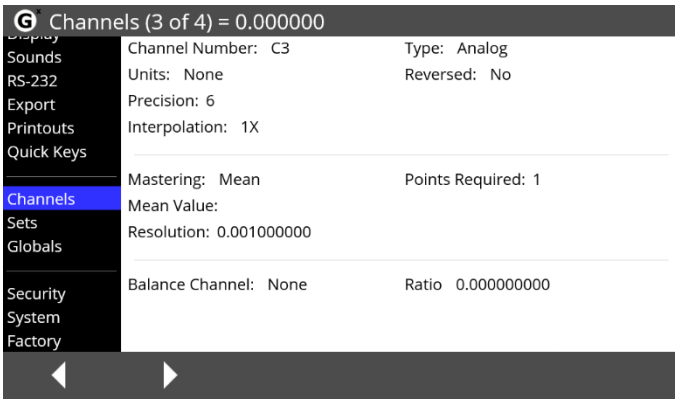


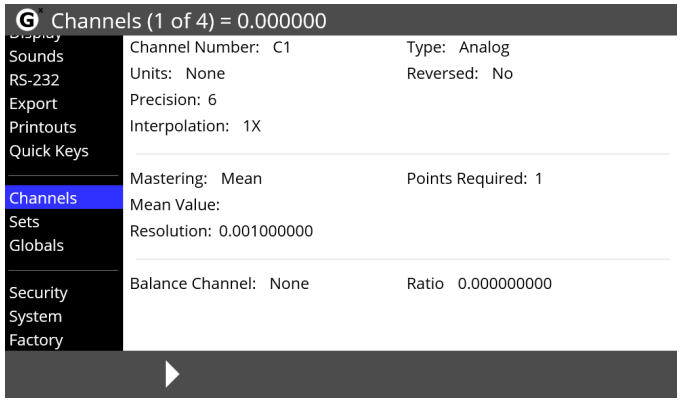

- *Channel Number* – Channel name and number.
- *Type* – Selects the channel type, which is Analog or Digital.
- *Units* – The units for the measurement data produced by this channel.
- *Reversed* – Sets the direction of counts when the probe is depressed or released.
- *Precision* – Sets the number of digits after the decimal place for mastering.
- *Interpolation* – Gives the count multiplier for the channel. This applies only to analog-type encoded channels.
- *Mastering* – Selects the type of channel preset. Encoded channels are set to *mean* mastering unless there are significant cosine errors that will impact the encoder's resolution.
- *Points Required* – Sets the number of times the ENTER key must be pressed for the mastering operation to be successful.
- *Mean Value* – The default value to preset the channel to during the mastering operation.
- *Resolution* – Represents the measurement value produced by each count on the encoder scale.
- *Balance Channel* – Lists a channel to be tied with this channel, usually an opposing mounted probe.
- *Ratio* – A calculated value representing the amount of movement for the balanced channels. A ratio of 1.0 indicates that the channels are perfectly balanced.

### ***Encoded Channel Setup***

To set up a channel of type encoder:

1. Use the arrow keys to navigate to the desired channel.
2. Set the channel type to either *Analog* or *Digital*. The default is *Analog*.
3. Set the units of measure for the channel, the count direction and precision. It is recommended to set higher precision for course units of measure.
4. Set the interpolation if the channel is of type *Analog*. The interpolation field is removed if the channel is of type *Digital*.



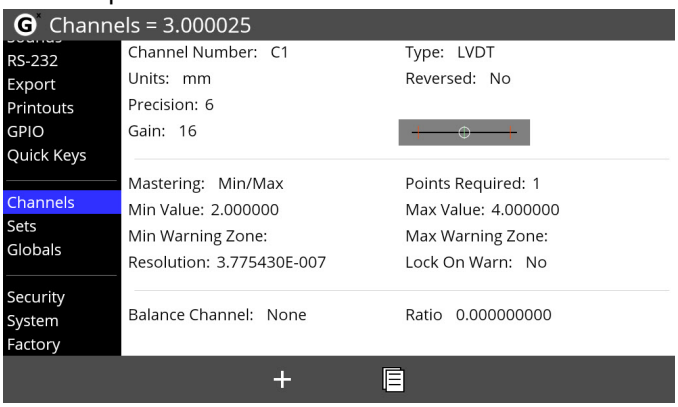
5 Set the Mastering type. For encoders with known resolution, set it type *Mean*. For unknown resolution, set it to type *Min-Max*.
6 Enter the points required.
7 Enter the mean value (for *Mean* mastering type) or minimum value and maximum value (for *Min-Max* mastering type).
8 Set the warning zone values (for *Min-Max* mastering type) if desired and turn on Lock on warn if desired.
9 Enter the resolution if known. Resolution can be taught in the case of *Min-Max* mastering type.
10 Set the channel to be linked to this channel if desired and teach the ratio.

Press the Finish button to save the changes.

## *LVDT/A2E*

Linear Variable Differential Transformer (LVDT) is a type of probe that uses differentials in its special internal electric coils to generate measurement information. There are a variety of these probes including full bridge, half bridge, and many more. An Air-to-Electric probe is like the LVDT-type but uses air pressure to generate measurement information. The fields in LVDT or A2E channel type are:

- *Channel Number* – Channel name and number.
- *Type* – The supported type which in this case is LVDT or A2E.
- *Units* – The units for the measurement data produced by this channel.
- *Reversed* – Sets the direction of counts when the probe is depressed or released.
- *Precision* – Sets the number of digits after the decimal place for mastering.
- *Gain* – Gives the count multiplier for the channel. This field must be configured properly, with the help of the centering indicator, before performing any mastering operations.
- *Mastering* – Selects the type of channel preset. LVDT/A2E channels are set to *Min/Max* mastering, which gives the ability to preset the channel (min value) and change the resolution (using the range between min and max value).



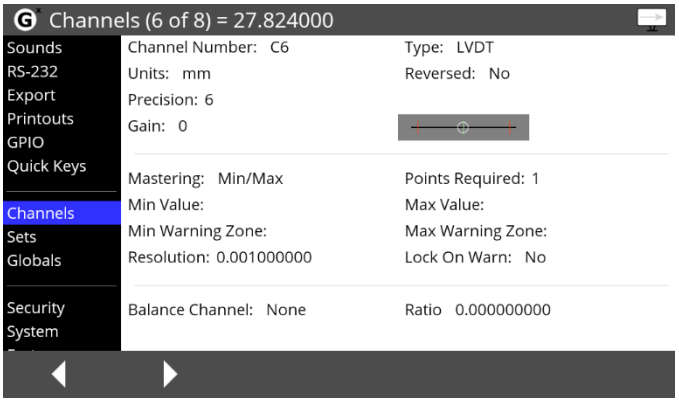
- *Points Required* – Sets the number of times the ENTER key must be pressed for a mastering operation to be successful.
- *Min Value* – The default value to preset the channel to during the mastering operation.
- *Max Value* – The high value used to calculate the range for determining the channel resolution.
- *Min/Max Warning Zones* – Provides a tolerance zone around the respective value when performing mastering.
- *Resolution* – Represents the measurement value produced by each count of the transformer.
- *Lock On Warn* – Enables/disables preventing the mastering process from proceeding if the current value is outside the min/max warning zones.
- *Balance Channel* – Lists a channel to be tied with this channel, usually an opposing mounted probe.
- *Ratio* – A calculated value representing the amount of movement for the balanced channels. A ratio of 1.0 indicates that the channels are perfectly balanced.

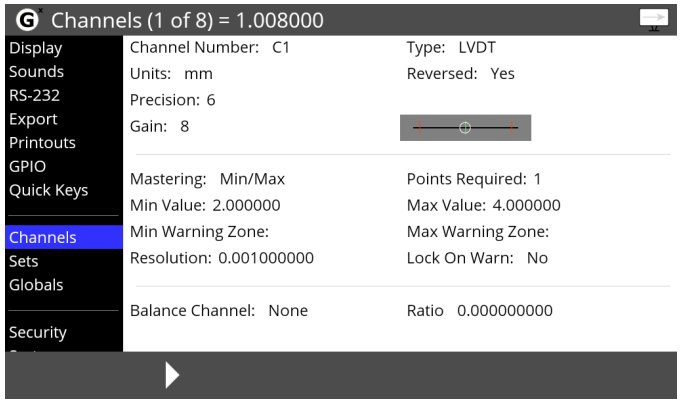
### ***LVDT/A2E Channel Setup***

To set up a channel of type LVDT/A2E:

1 Use the arrow keys to navigate to the desired channel and set the channel type.
2 Set the units of measure for the channel, the count direction and precision. It is recommended to set higher precision for course units of measure.
3 Select the Gain field and press the **Teach** button. Follow the prompts to complete the gain teach process.
4 Set the Mastering type. As probes of type LVDT/A2E do not have a known resolution, the mastering type is set to *Min-Max* by default.

5 Enter the points required.
6 Enter the minimum value and maximum value (for *Min-Max* mastering type). Enter the mean value (for *Mean* mastering type) once the correct resolution has been established.



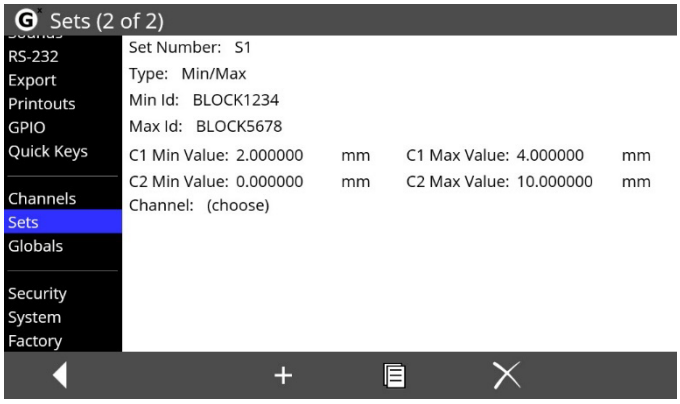

7 Set the warning zone values (for *Min-Max* mastering type) if desired and turn on Lock on warn if desired.
8 Teach the resolution using the *Min-Max* mastering type.
9 Set the channel to be linked to this channel if desired and teach the ratio.

Press the Finish button to save the changes.

## Sets

A *Set* is a grouping of channels that share a mastering type. The first set, S0, inherits the mastering type of the first channel (C1) and can only be changed by changing the mastering type of the first channel. Fields in the Sets screen include:

- *Set Number* – Set name and number.
- *Type* – Selects the type of mastering to be performed on the group of channels in the set.
- *Mean/Min/Max Id* – The identification label on the artifacts used in the mastering procedure.
- *Channel mean/min/max value* – Sets the value to preset the channel to.
- *Channel* – Enables channel selection.




***NOTE***
***Set S0 selects channels automatically using the Mastering setting in channel C1.***

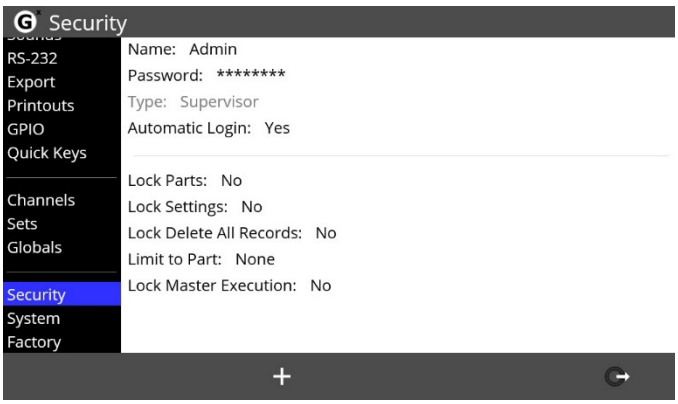
## Globals

Globals are sets of formulas that get evaluated to handle systemwide operations. Formulas used in Globals are typically used for inter-parts interactions, resource allocations and IO communications.

## Security

Data integrity is paramount in the Gx200, and defining different levels of access is an important component in building a secure system. The security setup page is used to define who has access to various parts of the system. There are three levels of users: Administrator, supervisor, and user. An *Administrator* is the top level user with access to factory settings, hence should be reserved for OEM level use. Fields in the Security screen include:

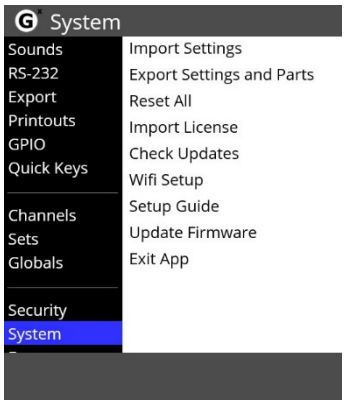
- *Name* – Name of user.
- *Password* – Password for this user.




- *Type* – The type of user level.
- *Automatic Login* – Enables/disables logging in this user automatically.
- *Lock Parts/Settings* – Enables/disables editing of parts/settings by this user.
- *Lock Delete All Records* – Enables/disables deleting all records by long-pressing the cancel button. You can still delete a single or multiple records.
- *Limit to Part* – Restricts the user to the assigned part only. *None* implies that the user has access to all parts.
- *Lock Master Execution* – Enables/disables mastering by this user. The option does not apply to administrator and supervisor level users.
- *Plus button* – Used to add a user.
- *Logout button* – Used to logout.

## System

The System screen provides tools to quickly configure, update or back up the system settings as well as resetting it. To use a tool from the list, highlight it and then press the ENTER button.




**CAUTION**

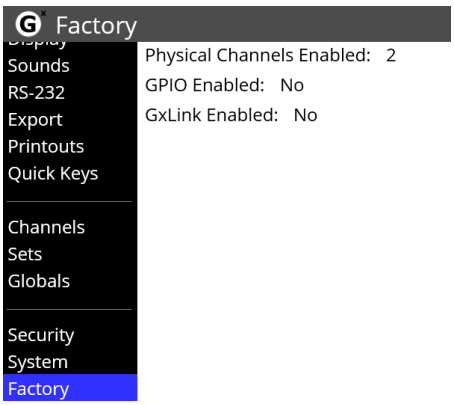
***These tools should only be used by well-trained personnel.***

The tools provided are:

- *Import Settings* – Replaces the current system settings with filed backup settings. This tool does not import parts.
- *Export Settings and Parts* – Saves system settings and parts to a USB flash drive or remote location.
- *Reset All* – Erases all configurations data and restores the system to factory defaults.
- *Check Updates* – Goes online to retrieve the latest version of the application if any is available.
- *Wifi Setup* – Used to configure Wi-Fi access.
- *Setup Guide* – Displays the system setup guide.
- *Exit App* – Closes the Gx200 software and exits to MetLogix applications launcher.

## Factory

Factory screen is used at administrative levels to configure the number of physical channels, general purpose input output (GPIO) and GxLink options in the system. Fields in the Factory screen include:




- *Physical Channels Enabled* – Maximum number of physical channels that can be configured in the system.
- *GPIO Enabled* – Enables/Disables the use of the General Purpose Input Output port.
- *GxLink Enabled* – Enables/Disables the use of GxLink communication protocol in the system.

# Section 3: Parts and Dimensions

Parts can be designed to measure from simple to complex artifacts and fixtures. The simplest part contains a single dimension displaying a single channel. Creating a complex part is an iterative process starting with a simple part, testing it, then adding more dimensions with advanced formulas. Testing the application with every addition will ensure that the final part is to the desired specifications. Parts can be created, edited, copied, imported, exported, or deleted. These part functions are available on the Parts system setup page.

## Parts toolbar

The parts toolbar is displayed when the Parts setup screen or the current part name is highlighted.

The parts toolbar contains:

1 Previous part button
2 Next part button
3 Create new button
4 Copy button
5 Delete button
6 Rename button (*when current part name is highlighted*)
7 Export Part button
8 Import Part button

***Previous part Button***

Press the Previous button to switch the current part to previous.

***Next part Button***

Press the Next part button to switch the current part to the next.

***Create new Button***

Press the Create new button to add a new part to the system and set it current.

***Copy Button***

Press the Copy button to create a copy of the current part (with a new name) and set it to current.

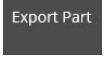
***Delete Button***

Press the Delete button to remove the current part from the system and set the next part current. If it is the last part in the list, then set the previous part current.

***Rename Button***

Press the Rename button to change the name of the current part.

***Export Part Button***




Press the Export Part button to save a copy of the current part to a USB flash drive.

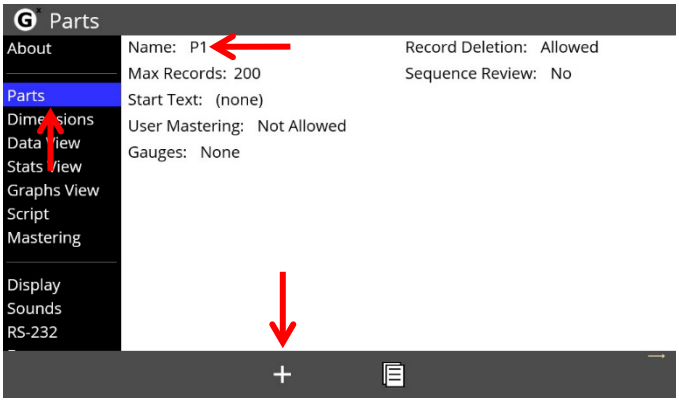
***Import Part Button***

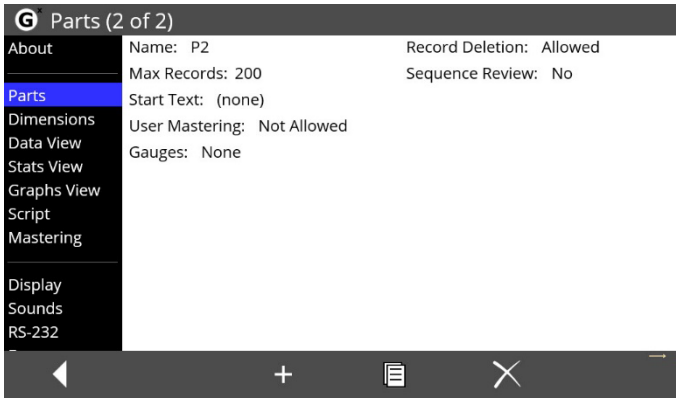
Press the Import Part button to load a selected part from a USB flash drive into the system and set it current. If the name of the part being imported matches a part already in the system, the part in the system will be overwritten.

## Creating a part

The system has a single part (named P1) by default. To create a new part, highlight the Parts setup item or the name field of the current part. Press the plus button. A new part is added to the list with a default name of P2, P3, and so forth.

The title is changed to reflect the number of parts in the system and the new part is set current. When there is more than one part in the system, navigation buttons and a deletion button are displayed. A part can also be added by duplicating the currently selected part. To duplicate a part, highlight the Parts setup item or the name field of the current part. Press the Copy button. A duplicate part is added to the list with a new name.




### *Part Gauges*

Parts can be set to display a gauge such as vertical, horizontal, dial or graphic. The type of gauge used can be changed interactively.

***NOTE***

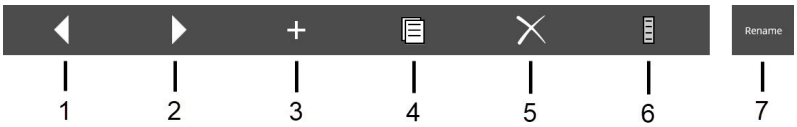
***The graphic gauge requires the use of the companion GxLink PC application for importing the image and linking it to the desired part. Refer to the GxLink section of this Setup guide for more details.***

## Dimension Setup

A dimension contains the part formula that is used to generate measurement and other part information. It is also used to classify artifacts under measure into logical groupings. A dimension is added as a component of a part. Each part contains at least one dimension.

### *Dimension toolbar*

The dimension toolbar is displayed when the Dimensions setup screen or the current part name is highlighted.




The dimension toolbar contains:

1 Previous dimension button
2 Next dimension button
3 Create new button
4 Copy button
5 Delete button
6 List button (*when Dimensions setup screen is highlighted*)
7 Rename button (*when current dimension name is highlighted*)

***Previous part Button***

Press the Previous button to switch the current dimension to previous.

***Next part Button***

Press the Next part button to switch the current dimension to the next.

***Create new Button***

Press the Create new button to add a new dimension to the current part and set it current.

***Copy Button***

Press the Copy button to create a copy of the current dimension (with a new name) and set it to current.

***Delete Button***

Press the Delete button to remove the current dimension from the part and set the next dimension current. If it is the last dimension in the list, then set the previous dimension current.

***List Button***

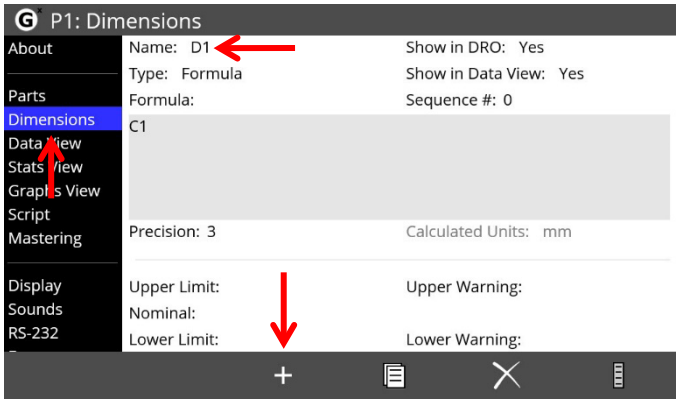
Press the List button to display a list of all dimensions in the current part. You can rearrange the dimensions by selecting a dimension and moving it up or down in the list.

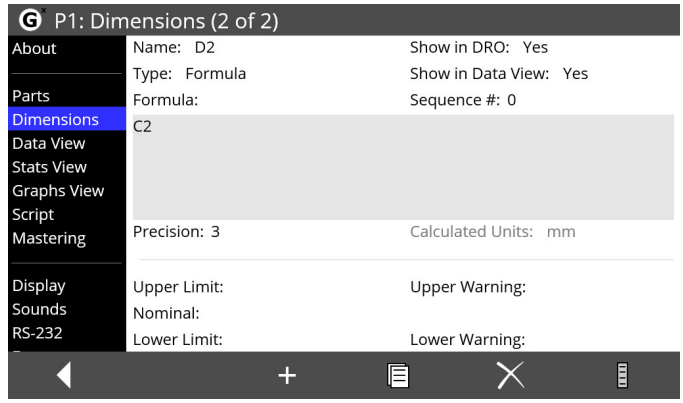
***Rename Button***

Press the Rename button to change the name of the current dimension.

## *Creating a dimension of type* Formula

Dimensions are created with a default type of *Formula*. The formula contained in the dimension can be edited to perform new calculations. To add a new dimension, highlight the Dimensions setup item or the name field of the current dimension. Press the plus button. A new dimension is added to the list with a default name of D2, D3, and so forth. The title is changed to reflect the number of dimensions in the current part and the new dimension is set current. When there is more than one dimension in the part, navigation buttons and a deletion button are displayed. A dimension can also be added by duplicating the currently selected dimension. To duplicate a dimension, highlight the dimension setup item or the name field of the current dimension. Press the Copy button. A duplicate dimension is added to the list with a new name.

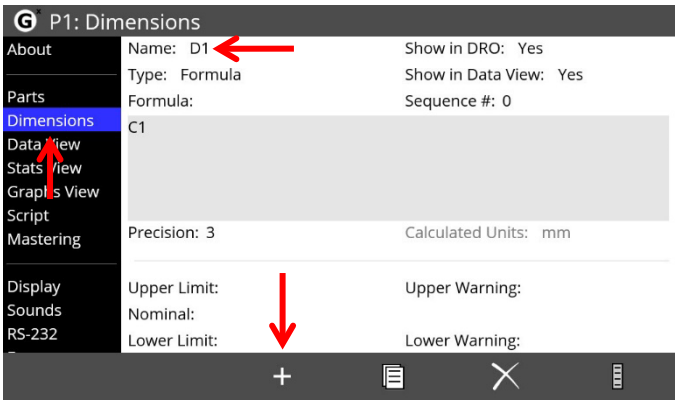


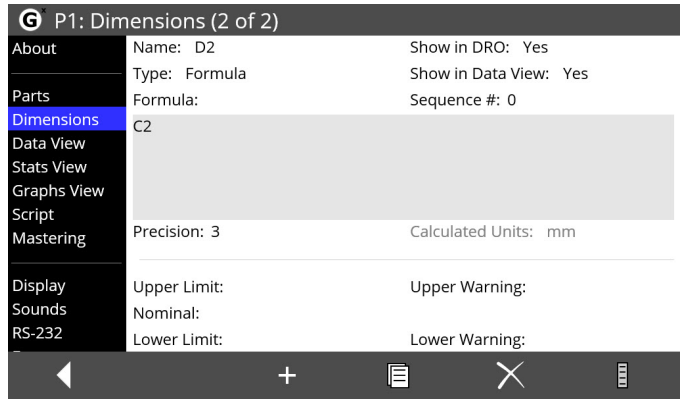




## *Creating a dimension of type* Class

To create a dimension of type *Class*:

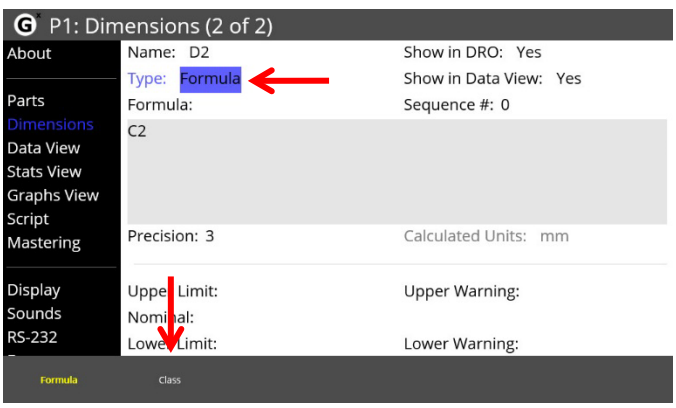
1. Highlight the Dimensions setup item or the name field of the current dimension. Press the plus button. A new dimension is added to the list with a default name of D2, D3, and so forth. The title is changed to reflect the number of dimensions in the current part and the new dimension is set current.
2. Select the field Type in the new dimension and set it to Class type by pressing the Class softkey.
3. Fill out the class condition details and press the Finish button when done. More condition rows can be added by pressing the plus button.

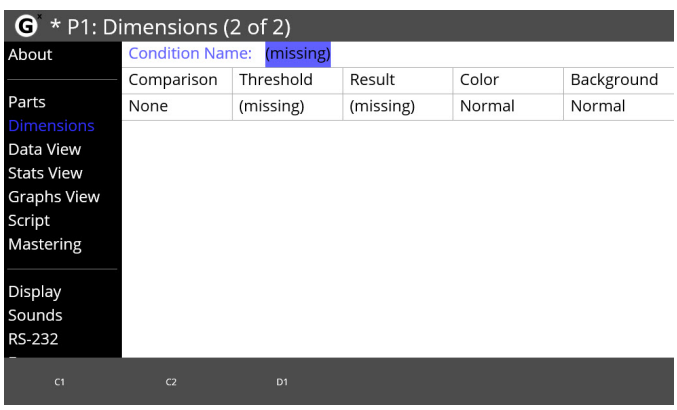


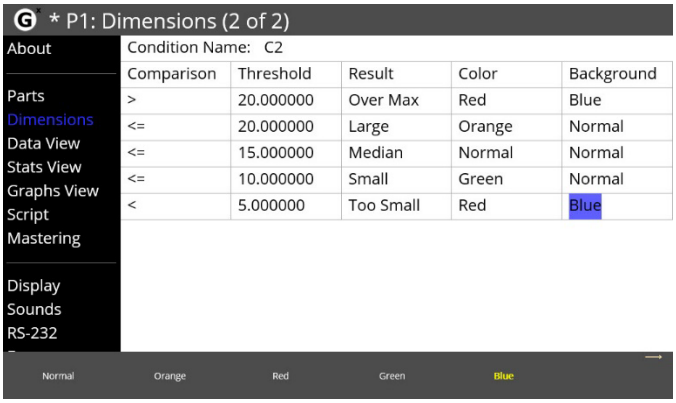



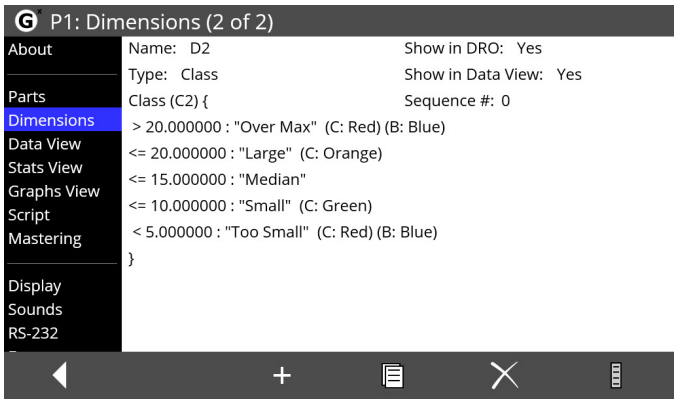

The following example illustrates how to set up a class dimension. In the example, dimension D2 classifies measurement readings from channel C2 (the channel units are millimeters). If a measurement is:

- Greater than 20.0 MM, D2 will display text “Over Max” in red, on a blue background.
- Less or equal to 20.0 MM (but greater than 15.0 MM), D2 will display text “Large” in orange, on a white background.
- Less or equal to 15.0 MM (but greater than 10.0 MM), D2 will display text “Median” in black, on a white background.
- Less or equal to 10.0 MM (but greater than 5.0 MM), D2 will display text “Small” in green, on a white background.
- Less than 5.0 MM, D2 will display text “Too Small” in red, on a blue background.



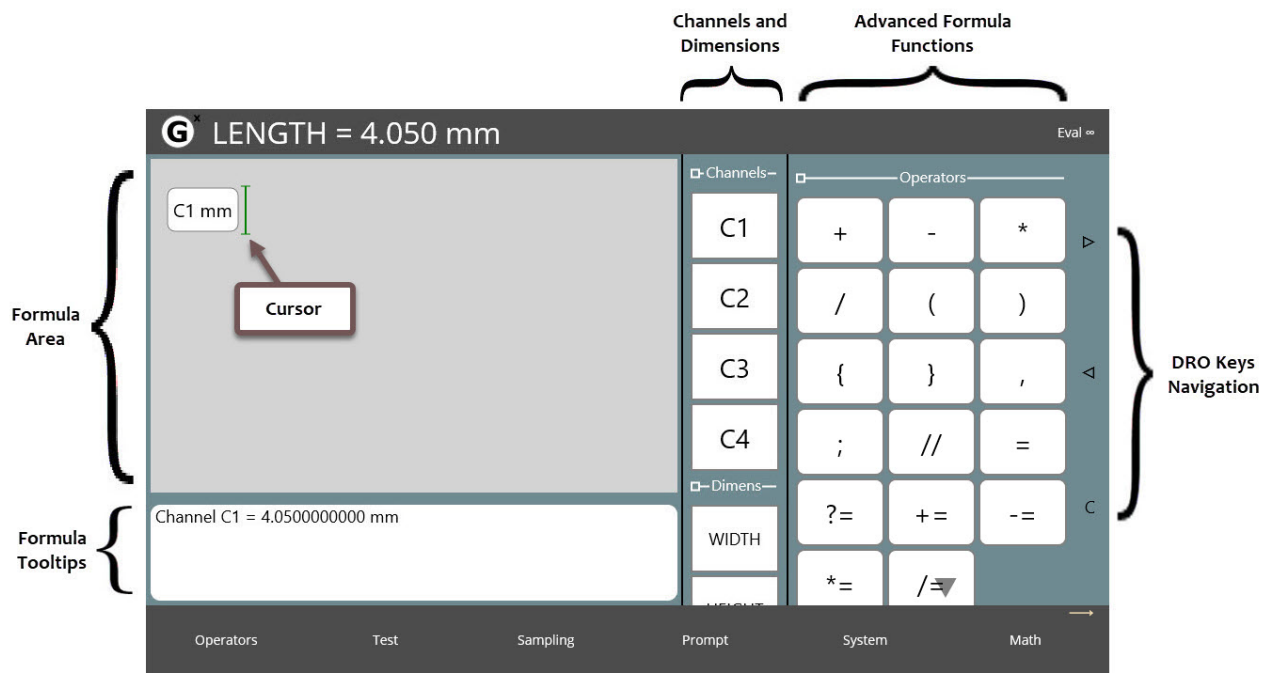



# Section 4: Formulas

Formulas are used to assign a dimension the results of a calculation or an evaluation. The parameters for the formula can be channel inputs, IO operations, and/or system events.

## Formula Screen

The formula screen is divided into three columns. The first column contains the formula area and formula tooltips, the second column contains the channels and dimensions, and the last column contains advanced formula functions.




### *Navigating the formula screen*

Navigating around the formula screen is straight forward and can be done by using either the touch screen or using the arrow keys. Other supported navigation mechanisms include:

- The DRO keys are used to navigate between dimensions without leaving the formula screen.
- Long-pressing on the Cancel button clears the formula area.
- Long-pressing the up arrow key places the cursor at the beginning of the formula entry and long-pressing the down arrow key places the cursor at the end of the formula entry.
- Touching (or clicking) a section title collapse or expands that section.

***NOTE***
***Long pressing the Quit button disables formula evaluations.***

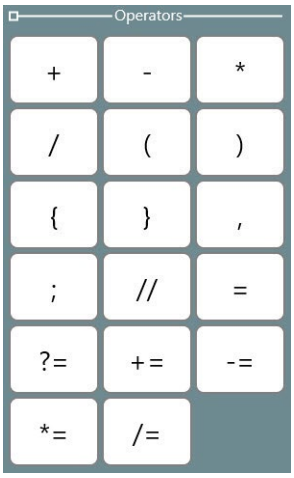
## Advanced Formula Functions

The advanced formula functions include items that can be used individually or in combination to create the desired formula. This list is divided into logical categories based on individual formula item characteristics. The groupings are operators, conditionals, test, sampling, math, prompt, system, records, tolerance, and extras.

## *Operators*

Operators are used for performing standard arithmetic such as additions, subtractions, multiplications, and divisions. The group contains:

1 Addition button
2 Subtraction button
3 Multiplication button
4 Division button
5 Open parenthesis button
6 Close parenthesis button
7 Open curly bracket button
8 Close curly bracket button
9 Comma button
10 Semi-colon button
11 Comment button
12 Assignment button
13 Is-Equal-to button
14 Add-to current button
15 Subtract-from current button
16 Multiply-with current button
17 Divide current-by button




### ***Addition, Subtraction, Multiplication and Division Buttons***

Used for standard arithmetic operations.

### ***Open and Close Parenthesis Buttons***

Used to group together a set of operands and operators to determine the order of evaluation. These two operators **must** be used as a pair.

### ***Open and Close Curly Brackets Buttons***

Used to group together a set of functions to determine the order of evaluation. These two operators **must** be used as a pair.

### ***Comma Button***

A comma operator is used to separate a set of parameters in a formula.

### ***Semi-colon Button***

Used to separate a set of compete formulas. The formulas are evaluated in sequence, starting with the formula before this operator followed by the formula after the operator.

### ***Comment Button***

Used to indicate that the text after this operator is a comment.

### ***Assignment Button***

An assignment operator is used to assign a value to a variable or a function.

### ***Is-Equal-To Button***

Used to compare a set of parameters and select the one that satisfies the condition and assigns it to a variable.

### ***Add-to, Subtract-from, Multiply and Divide Current Buttons***

Used in a conditional operation by taking two parameters, adding-to/subtracting-from/multiplying/dividing, the first parameter by the second parameter: then assigning the result to the first parameter.

## *Test*

Test group of functions are used to determine if a certain result is true or false and assign a function to be executed depending on the results. The group contains:

1. Equals to button
2. Not equal to button
3. Less than button
4. Less than or equal to button
5. Greater than button
6. Greater than or equal to button
7. Logical AND button
8. Logical OR button
9. Logical NOT button
10. If button
11. Elseif button
12. Else button
13. Boolean TRUE button
14. Boolean FALSE button
15. Variable button
16. Fail button

### ***Equals to and Not Equals to Buttons***

Boolean conditionals that are used to determine if two values are the same/not the same and returns TRUE if they are/if they are not. Otherwise, returns FALSE.

### ***Less than and Less than or Equal to Buttons***

Used to determine if one value is less than/less than or equal to another value and returns TRUE if its less than/if its less than or equal to. Otherwise, returns FALSE.

### ***Greater than and Greater than or Equal to Buttons***

Used to determine if one value is greater than/greater than or equal to another value and returns TRUE if its greater than/if its greater than or equal to. Otherwise, returns FALSE.

### ***Logical AND, OR and NOT Buttons***

Used to logically group (AND), select (OR), differentiate (NOT) two variables in a conditional operation. For AND, returns TRUE if both variables meet the condition; for OR, return TRUE if either of them satisfies the condition; and for NOT, returns TRUE if a specific one meets the condition and not the other. Otherwise, returns FALSE.

### ***If, Elseif and Else Buttons***

Used to give a cascade of choices.

### ***Boolean TRUE and FALSE Buttons***

Used for comparison operations.

### ***Variable Button***

Used to hold values that can be updated by the Assignment operator.

### ***Fail Button***

Returns true if the dimension(s) fail tolerances.

## *Sampling*

Sampling functions are used in evaluation of raw data and generation of records. The group contains:

1. Dynamic Min button
2. Dynamic Max button
3. Latch-at button
4. Reset Dynamic button
5. Auto Enter button
6. Set Sequence (number) button
7. On-Sequence (number) button
8. Minimum-Of button
9. Maximum-Of button
10. Range-Of button
11. Minimum Index button
12. Maximum Index button
13. Average button
14. Median button

### ***Dynamic Min and Dynamic Max Buttons***

Dynamic Min and Dynamic Max are used to perform real-time encoder reading and capture the minimum/maximum value. The value can then be assigned to a dimension, variable, or parameter.

### ***Latch-at Button***

The Latch-at function is used to precisely capture a value of a given encoder, when the reading on a second encoder is at a given value.

### ***Reset Dynamic Button***

Reset Dynamic is a function that clears the counters for dynamic min, dynamic max and latch-at functions. When this function is activated, the counters for dynamic min and dynamic max are set to current and for the latch-at operation, it is reset, and state set to live readings.

### ***Auto Enter Button***

The auto enter function is used to automatically *press* the ENTER key (perform operations like those of the ENTER key) when certain conditions are met.

### ***Set Sequence (number) Button***

Used to set the sequence to a given number. This function is most appropriate in a sequenced part.

### ***On-Sequence (number) Button***

Used to execute function statements when the part sequence reaches the given number.

### ***Minimum-Of and Maximum-Of Buttons***

Minimum-Of and Maximum-Of functions returns the minimum/maximum value among a set of given values.

### ***Range-Of Button***

Used to return the difference between the smallest and largest values in the given list.

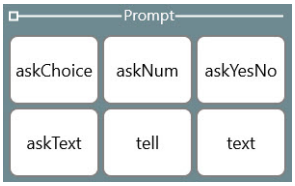
### ***Minimum Index and Maximum Index Buttons***

Returns a 1-based index of the smallest/largest value index in the list.

### ***Average and Median Buttons***

Used to return the average/median value from a set of values. The average is a calculated value while the median is a selected value from the given values (for odd number of values) and the *average* of the two median values (for even number of values).

## *Prompt*




Operators are used for performing standard arithmetic such as additions, subtractions, multiplications, and divisions. The group contains:

1 Ask (Choice) button
2 Ask (Number) button
3 Ask (Yes/No) button
4 Ask (Text) button
5 Tell button
6 Text button

### ***Ask (Choice, Number, Yes/No, and Text) Buttons***

The Ask operations presents the user with different options to give as a response to the question posed by the prompt.

- AskChoice presents the user with up to six choices to pick one from.
- AskNum presents the user with a field to enter a numeric value.
- AskYesNo prompts the user to choose either Yes or No.
- AskText presents the user with an entry field to enter an alphanumeric value.

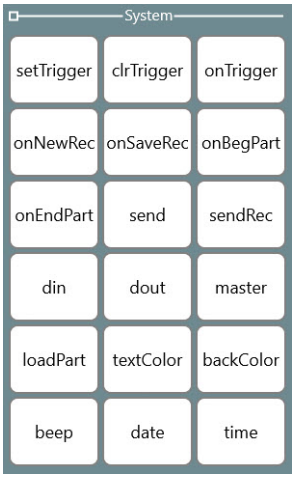
### ***Tell Button***

Used to present message dialog to the user.

### ***Text Button***

Used to enter numeric or alphanumeric into advanced formulas as needed.

## *System*




System functions support the operations of the entire system. They can be used to set text and background colors, control a robot arm through digital input or output, and lookup part or login information. The group contains:

1 Set Trigger button
2 Clear Trigger button
3 On Trigger button
4 On New Record button
5 On Save Record button
6 On Begin Part button
7 On End Part button
8 Send button
9 Send Record button
10 Digital Input button
11 Digital Output button
12 Master button
13 Load Part button
14 Text Color button
15 Background Color button
16 Beep button
17 Date button
18 Time button

### ***Set Trigger and Clear Trigger Buttons***

Set trigger activates an internal trigger and gives it a name using the trigger value (which can be a number or text). Clear trigger is used to deactivate this trigger.

### ***On Trigger Button***

Used to execute formula statements (one time only) when a trigger is activated. The statements will execute again once the trigger has been deactivated and reactivated.

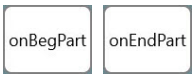
### ***On New Record Button***

Used to execute several function statements after a record has been saved into the database (when a new record starts).

### ***On Save Record Button***

Used to execute several function statements right before a record is saved into the database (right after pressing the ENTER key but before the record is saved into the database).

### ***On Begin Part and On End Part Buttons***




Used to execute formula statements when a part is loaded/unloaded.

***Send Button***

Used to send values or text out the RS-232 serial port.

send

***Send Record Button***

Sends the last record of a part to the RS232 port.

sendRec

***Digital Input and Output Buttons***

Digital input (din) returns the value of an IO line, or the binary sum of all lines. Digital out (dout) writes the value to an output line, or to all output lines.

din dout

***Master Button***

Used to initiate a mastering process for the given master set.

master

***Load Part Button***

Used to load a specific part.

loadPart

***Text and Background Color Buttons***

Used to set the text/background color of a dimension (and part background) to one of the supported colors.

textColor backColor

***Beep Button***

Used to make a sound.

beep

***Date and Time Buttons***

Returns the current date/time as text.

date time

## *Math*

Math group of functions can be used to perform complex calculation. The group contains:

1 Absolute button
2 Modulo button
3 Square root button
4 Cast button
5 Truncate button
6 Round button
7 Fraction button
8 Square button
9 Sine button
10 Cosine button
11 Tangent button
12 Arcsine button
13 Arccosine button
14 Arctangent button
15 Pi button

***Absolute Button***

Used to return an absolute value for a given value (the returned value is positive).

abs

***Modulo Button***

Returns the remainder after dividing the first value by the second value.

mod

***Square root Button***

Used to find the square root of a value.

sqrt

***Cast Button***

The Cast function can be used to replace the current units with desired units. The returned value is **NOT** mathematically converted from previous units to the new units.

cast

***Truncate Button***

Returns the whole number portion of a given value.

trunc

***Round Button***

Returns a value rounded to the specified precision.

round

***Fraction Button***

Used to return the fractional value of a given parameter.

***Square Button***

Returns the square of a given value.

***Sine, Cosine and Tangent Buttons***

Returns a number that is the mathematical sine/cosine/tangent of the given angle.

***Arcsine, Arccosine and Arctangent Buttons***

Returns an angle that the number is its mathematical sine/cosine/tangent.

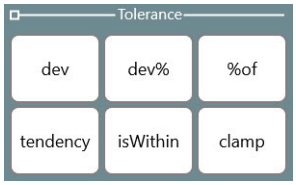
***Pi Button***

Gives the *pi* value.

## *Tolerance*

Tolerance functions supports the evaluation of given values and determining their pass fail status. The group contains:

1. Deviation button
2. Deviation Percentage button
3. Percentage-Of button
4. Tendency button
5. Is-Within button
6. Clamp button




***Deviation Button***

Returns the deviation of value from the given minimum or maximum values.

***Deviation Percentage Button***

Returns the percentage (fractional number) of the value from the given minimum and maximum values.

***Percentage-Of Button***

Returns the percent of the value between two given values where one is minimum and the other is maximum.

***Tendency Button***

Used to determine the tendency of the value in relation to the given minimum and maximum values.

***Is-Within Button***

Returns true if a value is within the given minimum and maximum values.

***Clamp Button***

Returns a value within the given minimum and maximum values.

## *Extra*

Extra is a grouping of special functions that are used for parts interactions and information gathering. The group contains:

1. Function button
2. Parameter button
3. Loop button
4. Return button
5. Translate button
6. Swap button
7. Last Record Number button
8. Record By Index button
9. Record Count button
10. Part Name button
11. User Name button
12. End-of-line button
13. Tab button

***Function Button***

Defines a user function.

***Parameter Button***

Used to define a function parameter.

para

***Loop Button***

The loop function repeatedly executes a set of function statements by the given number of times.

loop

***Return Button***

The return function immediately exits a formula with a value.

return

***Translate Button***

Used to return a number with new units, changing the value as appropriate.

translate

***Swap Button***

Used to exchange values of two given variables.

swap

***Last Record Number Button***

Returns the record number of the last record in the part database.

lastRecNo

***Record By Index***

Returns the value in a specified column, at a specified record index.

recByInd

***Record Count Button***

Returns the current count of records in the part database.

recCount

***Part Name and User Name Buttons***

Returns the name of the current part/user.

partName userName

***End-of-line Button and Tab Button***

End-of-line button is used terminates the current line of statements. The tab button is used to indent the current line by some spaces.

eol tab

# Section 5: Data Reporting & Export

After performing gaging measurements in the Gx200 you may want to view, print, or export it. The data is saved into Gx200 database and can be accessed by pressing the data button. The data can be graphed and statistically analyzed if desired.

## Data Records

Each part contains a unique database that is used to save data in a table format. The columns of the table are the part dimensions (that have the setting *Show in Data View* set to YES) and other user enable information while the rows are the individual measurement records.

### *Adding Records*

To add a data record into the database, complete a gaging measurement then press the ENTER key. Records are added one at a time.

Data View: GAGE

| # | LENGTH | WIDTH | HEIGHT | SURFACE_AREA | VOLUME |
|---|---|---|---|---|---|
| 3 | 6.2014 mm | 9.2718 mm | 4.9389 mm | 267.8375 mm² | 283.9776 mm³ |
| 4 | 7.2316 mm | 5.7368 mm | 6.7973 mm | 259.2727 mm² | 281.9944 mm³ |
| 5 | 4.8581 mm | 1.6867 mm | 8.0194 mm | 121.3591 mm² | 65.7122 mm³ |
| 6 | 8.5951 mm | 7.0397 mm | 5.9691 mm | 307.6652 mm² | 361.1719 mm³ |
| 7 | 7.9386 mm | 5.2823 mm | 2.8785 mm | 159.9809 mm² | 120.7072 mm³ |
| 8 | 9.4839 mm | 8.6961 mm | 11.4837 mm | 582.4932 mm² | 947.0945 mm³ |
| 9 | 4.0299 mm | 3.8683 mm | 3.9592 mm | 93.7188 mm² | 61.7194 mm³ |
| 10 | 7.2720 mm | 9.9182 mm | 5.4540 mm | 331.7610 mm² | 393.3706 mm³ |
| 11 | 7.2720 mm | 9.9182 mm | 5.4540 mm | 331.7610 mm² | 393.3706 mm³ |

**NOTE**
***The AutoEnter formula can be set up to save records into the database automatically.***

### *Deleting records*

There are three ways to delete records from the database:

- Individually – by highlighting the target record and pressing the CANCEL button.
- Group – by highlighting the target records and pressing the CANCEL button.
- Entire database – by long-pressing the CANCEL button. This clears the database of all records.

**NOTE**
***Once a record has been deleted, it cannot be recovered.***

### *Viewing records*

To view records, press the Data View/DRO button. After viewing the records, you can press the Data View/DRO button again or the FINISH key to return to the DRO. Gaging measurements can also be performed while in the data view and records saved into the database.

## Printing Data Records

Before printing ensure that the Gx200 has a configured printer to be used. If not, setup a printer by following these steps:

1. Press the Gx menu button or press the Menu button, then the settings button to enter Setup.
2. Scroll to the setting screen called Printouts.
3. Select the menu item called Printer Setup and press ENTER.
4. Use the touch screen to specify your printer device from the dropdown menu in the top left corner.

Pressing the Print button from the Data View menu will execute a print of the current data view.

**NOTE**

***If you are printing to a wireless printer, make sure that you have Wi-Fi/Bluetooth enabled in the unit and that you are connected to the correct network or device.***

## Exporting Data Records

Records can be exported to a USB storage drive or a PC (using RS232 or wirelessly via GxLink).

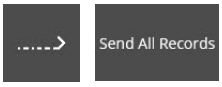
### *Exporting to a USB storage drive*

To export the saved data records to a USB storage drive:

1. Insert a USB drive into the Gx200 USB port.
2. Press the Export button from the bottom softkey toolbar.
3. Wait for the on-screen message indicating that the export is complete.

### *Sending to a PC via RS232*

Ensure the RS232 ports on the Gx200 and on the receiving PC are configured correctly and communicating before sending data. To send data records:




1. While in Data View, press the *Send Record* to send selected record(s), or *Send All Records* to send all records in the part's database. If no record is selected, *Send Record* will send the last record in the database.
2. Wait for the on-screen message indicating that the export is complete.

### *Exporting to a PC via GxLink*

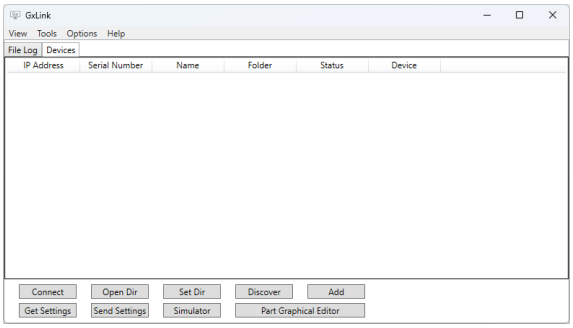
Using the companion GxLink application for export requires that the function is enabled on the Gx200. Also confirm that the application is configured and communicating with the Gx200 from which the data is to be exported. To export the data records:

1. Press the Export button from the bottom softkey toolbar.
2. Wait for the on-screen message indicating that the export is complete.

# Section 6: GxLink

GxLink is a powerful application that can be installed in Windows OS system and used to interface communication between one or more MetLogix Gx200 readouts and the computer. This connection is established via a wired or wireless network connection. Once connected, measurement results can be transferred from the Gx200 to the GxLink application over the network.

## What Can You Do With GxLink?




The GxLink application allows users to configure one or more Gx200 devices to send a measurement results file, in CSV or TSV format, directly to a specified folder on the target PC. This folder can be local to the GxLink PC, or a mapped network folder, accessible by the GxLink PC. Data received in the GxLink application will be displayed in a separate *tabbed* window for each device that is connected. This data can then be sent directly to a Microsoft Excel sheet, or it can be copied to, and pasted from, the Windows clipboard.

## Using the GxLink

To use the GxLink application with a Gx200 readout, the GxLink software must be installed on a computer running the Windows operating system. The computer should also be connected to a local network via a wired or wireless network device.

To send data from an Gx200 to an instance of the GxLink software, the Gx200 must have GxLink enabled in setup and the readout connected to a network.

### *Setting up the GxLink application*

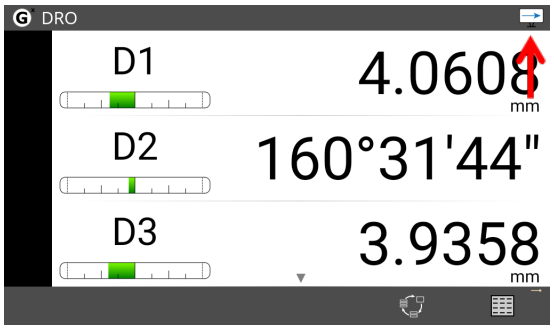
With the Gx200 readout connected to the PC's network and the GxLink option enabled in Setup, connecting one or more readouts to the GxLink application is accomplished by *Discovering* the readout from the **Devices** setup page in the GxLink software. The devices are identified by their serial number. To connect to a specific Gx200 readout, highlight the target device and then press the **Connect** button. This process can be summarized as:

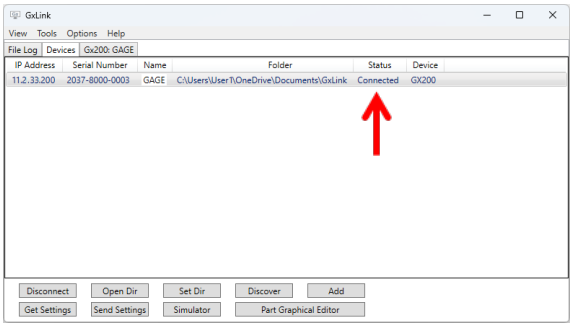
1. Press the **Discover** button to locate and list all the Gx200 connected to the network (if the target device is not already listed). The target readout will now be listed. Alternatively, use the **Add** button to add to the list the target Gx200 readout if the IP address is known.

2. Rename the target device to a more meaningful name, if desired, by double-clicking on the name field of the target device and typing in the new name. Then press the ENTER key on the PC.
3. Highlight the target device and press the **Connect** button. The status of the device in the list will change from *Not connected* to *Connected*.

**NOTE**

***If the device discovery fails to successfully locate target readout, verify that the Gx200 is connected to a network. If the Gx200 is discovered but fails to connect, verify that a valid IP address is reported in the Export setup menu (Setup -> Export).***

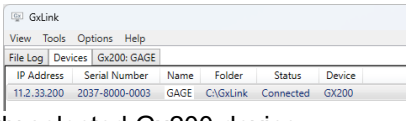



### *Setting target directory*

A local or networked directory can be set on the computer to save the transferred data files. The GxLink sets the default to directory to a subdirectory called *GxLink* in the current Setup documents directory. To set the default to a different directory:

1. Highlight the target device in the Devices tab list then press the **Set Dir** button.
2. Browse to the target directory using Windows files explorer.
3. Select the desired directory and press the **OK** button. The path to the selected directory will be shown on the *Folder* field of the device.




The **Open Dir** button can be used to open the directory assigned to the currently selected Gx200 device.

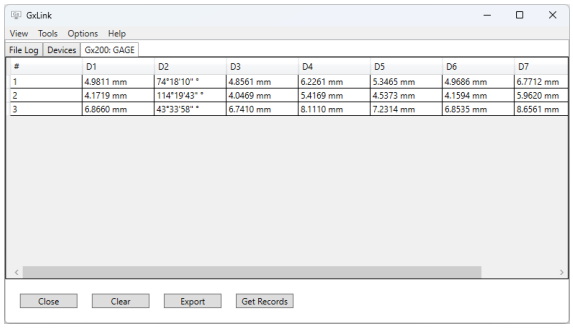
## Data Operations

Each connected Gx200 device has its own data tab within the GxLink main window. If the tab of a connected Gx200 readout is not open, double-clicking on the device in the device list will open the tab.

### *Device data tab*

The device data tab contains the name of the device in the tab title, a set of data columns and tab manipulation buttons. The column names are set automatically to the data that has been imported into GxLink application. The tab manipulation buttons include:

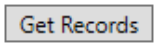
- **Close** button – Used to close the tab.
- **Clear** button – Clears the contents of the tab when pressed.
- **Export** button – Opens an Excel sheet and posts the current tab data.
- **Get Records** button – Requests new data records from the Gx200 device associated with that data tab.




A device data tab can be *dragged* out of the main GxLink window, creating its own standalone window. The individual device windows can be recombined with the GxLink application by *dragging* them back in, next to the existing tabs.

### *Sending Gx200 Data to GxLink*

Data is sent to GxLink using the Export Data function in Gx200 or by requesting new data from GxLink using the **Get Records** button. Received data is formatted according to the selected setting in the Export setup page of the Gx200.



**NOTE**

***When data is sent from an Gx200 to the GxLink application, only the most recently transferred data will be displayed in the corresponding device tab and a file is saved in the assigned target directory. When new data is received from the Gx200, it replaces currently displayed data, and a new file is saved in the assigned directory.***

### *Copy/Paste*

Results rows within the tab views can be selected using the left mouse button. Selected data rows can be copied to the Windows clipboard according to standard windows convention.

### *Sortable columns*

Ordered sorting of the data columns can be achieved by clicking on the column header label. Column contents will be toggled between ascending and descending order.

### *Send selected data to Excel*

Selected rows in the tabbed view can be sent directly to Microsoft Excel. This feature requires that Microsoft Excel is installed on, and licensed to, the same computer the GxLink is running on. Select the rows of data you would like to send and press the **Export** button. Pressing the **Export** button with no rows selected will send the entire contents of the data tab.

## Gx200 Simulator

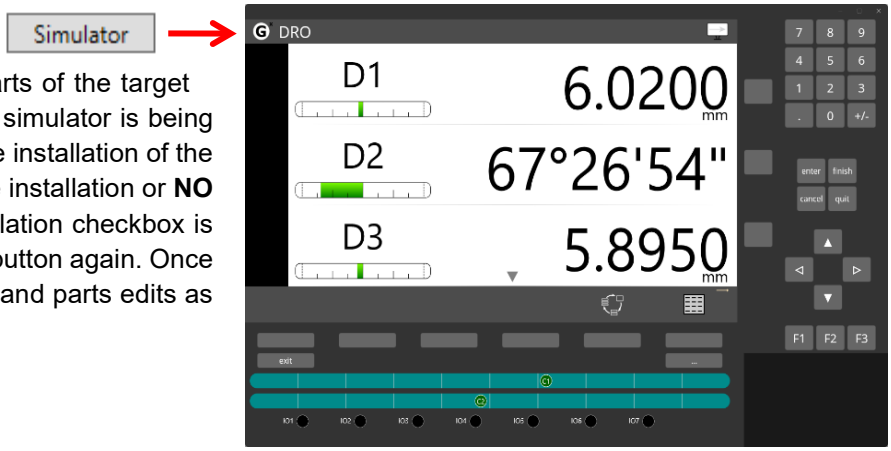
GxLink contains a simulator function that emulates Gx200 functions. The Gx200 simulator is a powerful tool that can be used to set up the Gx200 readout, test formulas and emulate input and output operations. The simulator contains most functions found in the Gx200.

### *Get Settings*

Before starting to use the simulator, connect to a target Gx200 readout by following the steps above. Once GxLink and the target Gx200 device are communicating, highlight the target Gx200 device in the list and then press the **Get Settings** button to fetch its current settings.

### *Using the Simulator*

To use the simulator, press the **Simulator** button. A Gx200-like application will open with settings and parts of the target Gx200 readout. If this is the first time the simulator is being used on the PC, GxLink will prompt for the installation of the simulator. Select **YES** to continue with the installation or **NO** to cancel. Ensure the **Launch** after installation checkbox is checked. Otherwise, press the Simulator button again. Once the simulator is running, perform settings and parts edits as desired.




**NOTE**

***The simulator MUST first be installed on the PC before it can be used.***
***Exporting/importing settings/parts from/into the simulator, the default location is the Gx200_Exports subfolder of the Documents system folder. So, to import a part/settings into the simulator, the part/settings file must be copied into the Gx200_Export subfolder.***

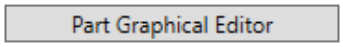
### *Sending Settings*

After making changes to settings and parts in the simulator, test the workflow to ensure they perform the desired operations. Once satisfied with the changes, you can send the edited settings and parts back to the target Gx200 or to a different unit that is in the list and currently connected, by highlighting the unit in the list and pressing the **Send Settings** button. The simulator will close, and a message will be displayed showing the result of the settings and parts transmission to the selected device.

## Part Graphical Editor

It may be necessary to prompt the readout operator on how to place the part under measure into the gage fixture using visual cues. This can be accomplished using the intuitive *Graphic* gage type display. To design the graphical gage, use the *Part Graphical Editor* in GxLink. To use the Part Graphical Editor, follow these steps:

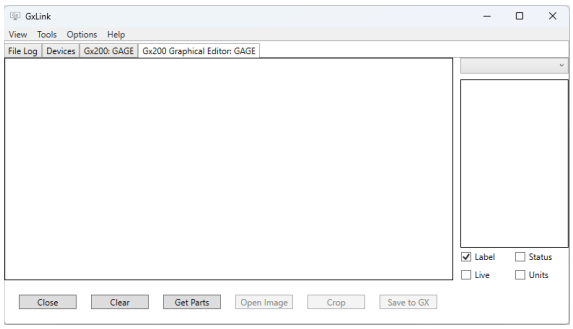
1. Run GxLink and connect to a target Gx200 readout.
2. Highlight the target Gx200 readout and then press the **Part Graphical Editor** button. A tab named *Gx200 Graphical Editor: <Readout name>* will open.




### *Gx200 Graphical Editor tab*

The Gx200 Graphical Editor tab contains the name of the device in the tab title, an image marking area, a parts dropdown list field, a dimensions column, and tab manipulation buttons. The tab manipulation buttons include:

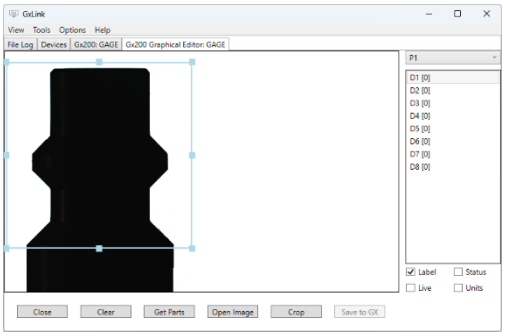
- **Close** button – Used to close the tab.
- **Clear** button – Clears the contents of the tab when pressed.
- **Get Parts** button – Gets all parts in target Gx200 readout.
- **Open Image** button – Opens Windows file browser for browsing to an image to be used.
- **Crop** button – Crops the image to the size of bounding square.
- **Save to Gx** button – Saves the graphical data to the Gx200 device associated with the tab.

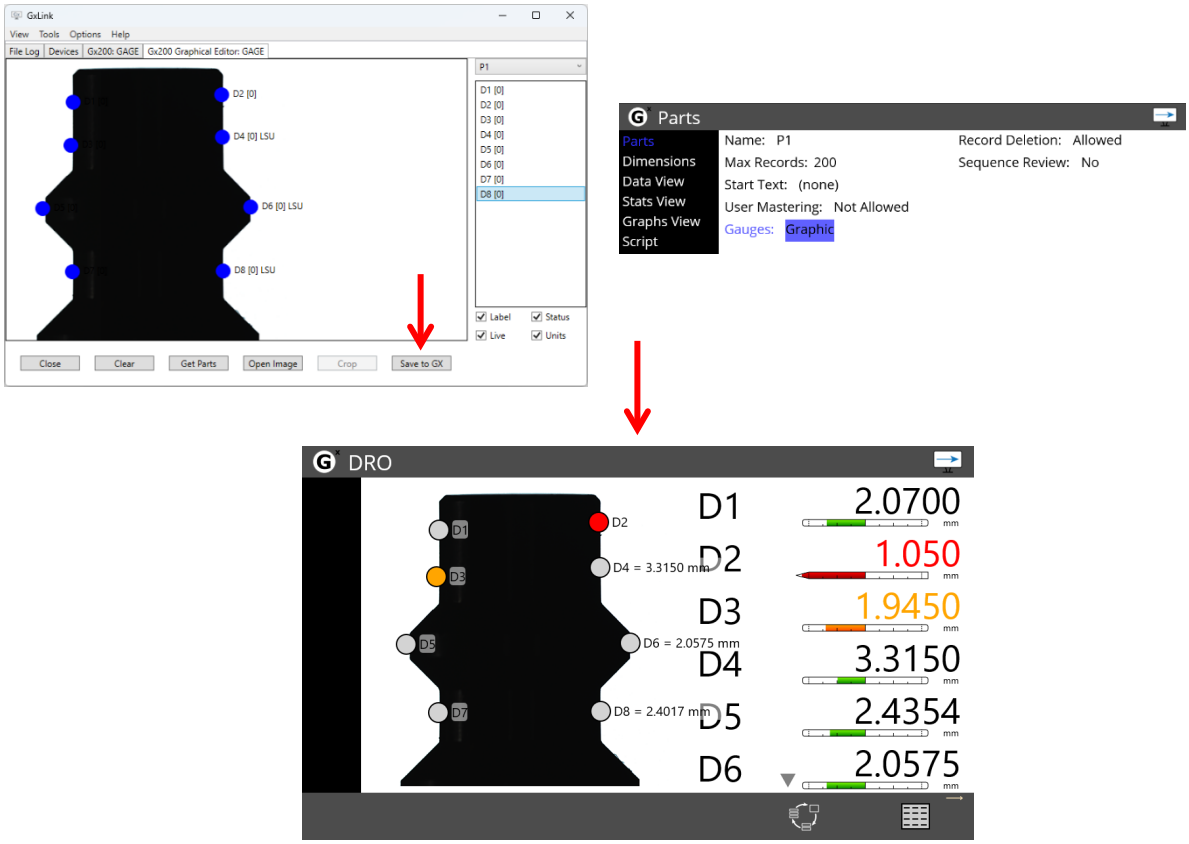



### *Marking the Part Graphics*

The first step to marking a part graphics is to get the parts from the Gx200 device. Press the **Get Parts** button to get the parts. Then:

1. Select the desired part from the dropdown list.
2. Press the **Open Image** button and browse to the desired image.
3. Resize and move the marquee bounding square to include the desired regions of the image.
4. Press the **Crop** button to crop the image under the square.
5. Add dimensions information to the image by selecting the dimension and clicking on the image.
6. Drag the dimension to reposition on the image as desired.
7. Once done, press the **Save to Gx** button to send the information back to the Gx200 device.
8. To display the graphic on the Gx200 device, set the part gauges field to *Graphic*.






## Additional Functions

Listed below are some additional settings and controls in the GxLink software:

### ***View menu***

Select the corresponding item from the view menu to add a new tab for the *File Log* and *Devices* if the tab has been dragged out. Otherwise, it brings the tab to the forefront.

### ***Tools menu***

The GxLink software contains tools to restore the previous status of the unit. The submenu tools include:

- **Simulator** – This menu item opens the simulator using the settings from previous session unlike when opening it using the **Simulator** button. If it is the first time, the simulator will start with default settings.
- **Backup** – The backup function gets settings and parts from the connected Gx200 and saves them to the PC.
- **Restore** – The restore function loads the connected Gx200 with unmodified settings and parts. These configuration parameters are from the last backup.

### ***Options menu***

The Options menu provides a way to set the preferences for the GxLink application. The submenu include:

- **Launch on Startup** – When checked, GxLink will launch when Windows OS starts.
- **Language** – Brings up a language selection dialog. Select the desired language and press the OK button. The application restarts to apply the language change.

### ***Help menu***

Access a copy of the User and Setup guide in PDF format by selecting the *Help…* item from the **Help** menu. Software version information can be found in the **Help -> About** menu item.

### ***File Log***

A tab displaying a history of all transferred data files from connected Gx200 devices to the GxLink application. The file log is cleared on program shutdown.

### ***Run in the Background***

The GxLink application can be minimized to the Windows Taskbar system tray. The application can be restored by single-clicking the tray icon. The application can be closed by right clicking on this tray icon. When exiting the application, you will be given the option to run in the background, close the application entirely, or to return to the GxLink window.

# Section 7: Application Examples

Parts can be designed to handle from simple gaging tasks to complex automation gaging measurements workflows. Each part can be unique or similar with slight variations in dimensions and formulas.
The following is a sample list of Parts:

### ***Single Channel Input***

1 Part to measure block length.
*Part name*: **BlockLen**
*Dimension*: **Length** = C1 – Takes measurements from channel C1 and assign to **Length**.

2 Part to measure block volume using sequence – *sequence number is in* ().
*Part name*: **BlockVol**
*Dimensions*: **Length** (1) = C1 – Takes measurements from channel C1 and assign to **Length**.
**Width** (2) = C1 – Takes measurements from channel C1 and assign to **Width**.
**Height** (3) = C1 – Takes measurements from channel C1 and assign to **Height**.
**Volume** (0) = Length * Width * Height – Multiplies values of **Length**, **Width** and **Height** and assigs result to **Volume**.

3 Part to measure TIR.
*Part name*: **TIR**
*Dimensions*: **Dmin** = dynMin(C1) – Captures the dynamic min of C1 and assign to **Dmin**.
**Dmax** = dynMax(C1) – Captures the dynamic max of C1 and assign to **Dmax**.
**Runout** = Dmax - Dmin – Subtracts value of **Dmin** from **Dmax** to calculate runout and assign result to **Runout**.

### ***Multi-channels Input***

Part to measure flatness of a surface.
*Part name*: **TableTop**
*Dimension*: **Corner1** = C1 – Takes measurements from channel C1 and assign to **Corner1**.
**Corner2** = C2 – Takes measurements from channel C2 and assign to **Corner2**.
**Corner3** = C3 – Takes measurements from channel C3 and assign to **Corner3**.
**Corner4** = C4 – Takes measurements from channel C4 and assign to **Corner4**.
**CenterP** = C5 – Takes measurements from channel C5 and assign to **CenterP**.

### ***Class Sorting***

Part to sort items into classes according to their sizes.
*Part name*: **BlockSort**
*Dimensions*: **Size** = C1 – Takes measurements from channel C1 and assign to **Size**. *C1 is in MM*.
**Sort** = Class (C1) {
<= 0.0000 : “No Block” – Will show “**No Block**” text in black when C1 is less or equal to 0.0000 MM.
<= 2.0000 : “Small” (C: Blue) – Will show “**Small**” text in blue when C1 is less or equal to 2.0000 MM but greater than 0.0000 MM.
<= 5.0000 : “Medium” (C: Green) – Will show “**Medium**” text in green when C1 is less or equal to 5.0000 MM but greater than 2.0000 MM.
<= 10.0000 : “Large” (C: Orange) – Will show “**Large**” text in green when C1 is less or equal to 10.0000 MM but greater than 5.0000 MM.
> 10.0000 : “Too Big” (C: Red) (B: Blue) – Will show “**Too Big**” text in Red on a blue background when C1 is greater than to 10.0000 MM.

## ***Use of Triggers***

Use triggers to activate part master.

Map quick key **DRO1** to Trigger “Trig1”.

*Part name*: **BlockLen**

*Dimension*: **Length** = C1 – Takes measurements from channel C1 and assign to **Length**.

*Global script*: onTrigger("Trig1"){master("S1");clrTrigger( "Trig1")} – When the DRO1 key is pressed, system prompts user to perform a mastering operation.

## ***Din Dout Example***

Part to measure block volume using sequence automatically – sequence number is in ().

Set IO line 1 to *In* and IO line 2 to *Out*.

*Part name*: **BlockVol**

*Dimensions*: **Length** (1) = C1 – Takes measurements from channel C1 and assign to **Length**.
**Width** (2) = C1 – Takes measurements from channel C1 and assign to **Width**.
**Height** (3) = C1 – Takes measurements from channel C1 and assign to **Height**.
**Volume** (0) = Length * Width * Height – Multiplies values of **Length**, **Width** and **Height** and assigns result to **Volume**.

*Part script*: if(din(1)==1){setTrigger("TrigB")}; – System checks the state of IO line 1 and sets a trigger if high.
if(din(1)!=1){clrTrigger("TrigB"); dout(2,0)}; – If low, clears the trigger and set IO line 2 to low.
onTrigger("TrigB"){autoEnter(0s)}; – Auto-Enters **once** when the trigger is set.
onNewRec{ dout(2,1)} – System sets IO line 2 to high when a record has been saved.

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## 9. Export Rules

You acknowledge that the Software is subject to the U.S. Export Administration Regulations and other export laws, restrictions, and regulations (collectively the "Export Laws") and that you will comply with the Export Laws. You will not ship, transfer, export, or re-export the Software, directly or indirectly, to: (a) any countries that are subject to US export restrictions (currently including, but not necessarily limited to, Cuba, Iran, North Korea, Sudan, and Syria) (each, an "Embargoed Country"), (b) any end user who you know or have reason to know will utilize them in design, development or production of nuclear, chemical or biological weapons, or rocket systems, space launch vehicles, and sounding rockets, or unmanned air vehicle systems (each, a "Prohibited Use"), or (c) any end user who has been prohibited from participating in U.S. export transactions by any federal agency of the U.S. government (each, a "Sanctioned Party"). In addition, you are responsible for complying with any local laws in your jurisdiction which may impact your right to import, export or use the Software. You represent and warranty that (i) you are not a citizen of, or located within, an Embargoed Country, (ii) you will not use the Software for a Prohibited Use, and (iii) you are not a Sanctioned Party. All rights to use the Software are granted on condition that such rights are forfeited if you fail to comply with the terms of this agreement.

## 10. General Provisions

If any part of this Agreement is found void and unenforceable, it will not affect the validity of the balance of this Agreement, which will remain valid and enforceable according to its terms. This Agreement may only be modified in writing, signed by an officer of MetLogix, Inc. The English version of this Agreement will be the version used when interpreting or construing this Agreement. This is the entire Agreement between MetLogix and you relating to the Software and it supersedes any prior representations, discussion, undertakings, communications, or advertising relating to the Software.

## 11. Notice to U.S. Government End Users

For U.S. Government End Users, MetLogix agrees to comply with all applicable equal opportunity laws including, if appropriate, the provisions of Executive Order 11246, as amended, Section 402 of the Vietnam Era Veterans Readjustment Assistance Act of 1974 (38 USC 4212), and Section 503 of the Rehabilitation Act of 1973, as amended, and the regulations at 41 CFR Parts 60-1 through 60-60, 60-250, and 60-741. The affirmative action clause and regulations contained in the preceding sentence will be incorporated by reference in this Agreement.

## 12. Compliance with Licenses

If you are a business, company, or organization, you agree that, in addition to any license compliance checking performed by the Software, MetLogix or its authorized representative have the right, no more than once every twelve (12) months, upon ten (10) days' prior notice to you, to inspect your records, systems, and facilities to verify that your use of any and all MetLogix software is in conformity with your valid licenses from MetLogix. For example, MetLogix has the right to those of your records useful to determine whether installations of the Software have, or have not, been serialized, and you shall provide such records to MetLogix promptly upon request by MetLogix. Additionally,

you shall provide MetLogix with all records and information requested by MetLogix in order to verify that your use of any and all MetLogix software is in conformity with your valid licenses from MetLogix within thirty (30) days of MetLogix' request.

## 13. Peer to Peer Communications

The Software may use your connection to a local area network, without additional notice, automatically connect to other MetLogix software and, in doing so, may indicate on the local area network that it is available for communication with other MetLogix software. These connections may transmit the IP Address of your connection to the local network but no personally identifiable information is ever transmitted or received through such network connections (except to the extent that IP addresses my be considered personally identifiable in some jurisdictions).