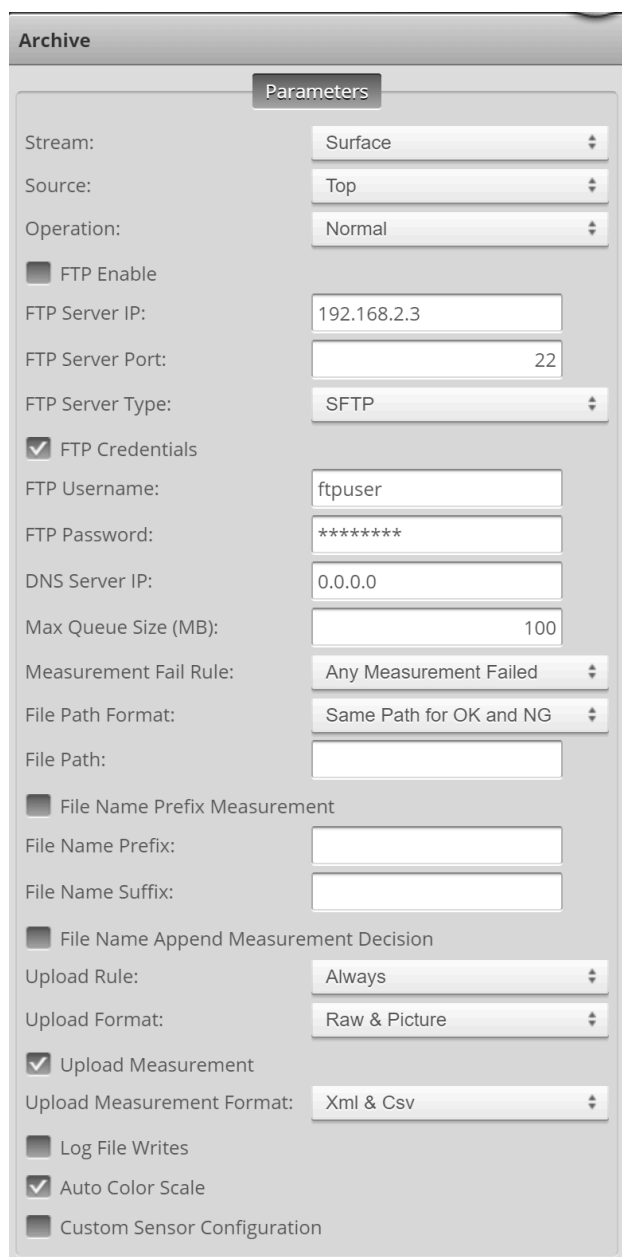


# Archive Tool User Manual

## 1. General introduction

This tool provides export functionality of single frame recordings that satisfy specific conditions, based on measurements, to an FTP/SFTP server. This is useful to replay frames that failed certain measurements, in order to visualize or identify the problems encountered.

## 2. Parameters



The screenshot shows the 'Archive' window with the 'Parameters' tab selected. The parameters are as follows:

- Stream: Surface
- Source: Top
- Operation: Normal
- ☐ FTP Enable
- FTP Server IP: 192.168.2.3
- FTP Server Port: 22
- FTP Server Type: SFTP
- ☒ FTP Credentials
- FTP Username: ftpuser
- FTP Password: \*\*\*\*\*
- DNS Server IP: 0.0.0.0
- Max Queue Size (MB): 100
- Measurement Fail Rule: Any Measurement Failed
- File Path Format: Same Path for OK and NG
- File Path:
- ☐ File Name Prefix Measurement
- File Name Prefix:
- File Name Suffix:
- ☐ File Name Append Measurement Decision
- Upload Rule: Always
- Upload Format: Raw & Picture
- ☒ Upload Measurement
- Upload Measurement Format: Xml & Csv
- ☐ Log File Writes
- ☒ Auto Color Scale
- ☐ Custom Sensor Configuration

## FTP - Server Setup

Parameter	Explanation	Note
Stream	Input stream	This parameter has no impact on the tool's behavior and can remain as the default value
Source	Source of the input stream	This parameter has no impact on the tool's behavior and can remain as the default value
Operation	Normal / Test FTP Server / Update Information / Update Outputs	<p>This is used to execute specific operations prior to normal execution. Once the operation has been executed, the parameter switches back to Normal.</p> <p>Test FTP Server: The tool will try to connect and validate the credential of the FTP server. If anything fails, the log will show the success or the failure.</p> <p>Update Information: Refresh of specific internal configurations. Not required, as this is already done automatically.</p> <p>Update Outputs: Enable the required outputs in the Gocator Protocol. Should be done after adding/removing sensors, changing the intensity flag, or modifying Gocator outputs manually, to ensure that the recordings are valid. See section about Gocator Protocol further down.</p>
FTP Enable	Enable / disable communication to FTP	Enabling this will cause the tool to log into the FTP server at the specified address and user credentials. If the FTP server is NOT connected, it will retry at specified intervals.
FTP Server IP	FTP server IP to connect to	
FTP Server Port	FTP server port	Typically 21 for standard FTP, 22 for SFTP
FTP Server Type	FTP or SFTP	
FTP Credentials	Show or hide the FTP username/password	When checked, the username and passwords can be edited. It is recommended to uncheck this after the credentials have been edited to hide the password.
FTP Username	FTP username	
FTP Password	FTP password	When setting the password once, the field will be replaced by stars to avoid being visible to everyone.

Parameter	Explanation	Note
DNS Server IP	DNS Server	Used when the FTP Server is not an IP address, but a string (server name).
Max Queue Size (MB)	Maximum size of all the files to archive in the queue	A queue handles the archiving of files in the tool. When the queue fills up faster than the server can receive them, the size of the queue can cause high memory usage. This parameter limits the size of the queue to avoid any crash. The default is 100MB, it can be set higher for an accelerated sensor, or on GoMax. On sensor, it can also be reduced, if the memory usage is limited.
Measurement Fail Rule	<p>Rule that determines whether the measurement for the frame has failed</p> <p>Any, All, One or Always measurement failed</p>	The result of this rule controls how to determine if an input data has failed measurement or not.

### FTP - File Path Configuration

Parameter	Explanation	Note
File Path Format	Same or separate file path for good and failed measurement frame,	Decide based on the Measurement Fail Rule. If separate file path is selected, user will need to enter the file path in File Path NG
File Path	Paths to store archive data to FTP server	Specify the home path. 64 characters max.  Use for storing all uploaded data if FTP File Path Format is "Same". Use for storing good data if path format is "Separate"  Make sure the direction of the slash ('/' or '\') is correct!
File Path NG	Paths to store archive failed data to FTP server	Only available when FTP File Path Format is "Separate"

### FTP - File Name Control

Parameter	Explanation	Note
File Name Prefix Measurement	Enable/disable prefixing the filename with measurement value	Prefix with the value of a specific measurement. Next parameter selects which measurement to use
Prefix Measurement ID	Measurement ID of the measurement value prefix to the file name	Parameter is only available when FTP File Name Prefix Meas is enabled  Only the integer portion of the measurement value is used in the filename
File Name Prefix	User specified string to prefix to the file name	64 characters max
File Name Suffix	User specified string to append to the file name	64 characters max
File Name Append Meas Decision	Append the data measurements' state to the file name	Append _OK or _NG depend on the measurement state, determined based on  Decision is based on the Measurement Fail Rule

When multiple prefix and suffix options are selected, their order in the file name will be

<Measurement Value Prefix>\_<FileName Prefix>\_<Frame>\_<Stamp>\_<Body>\_<File Name Suffix>\_<Measurement Decision>.<Extension>

<Frame>, <Stamp>, <Body> and <Extension> are not configurable

### FTP - Upload Control

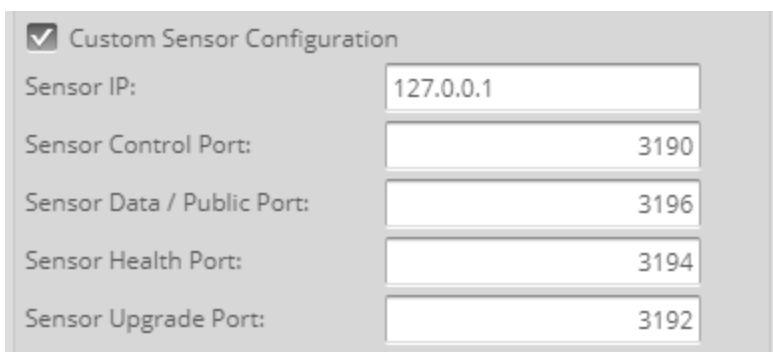
Parameter	Explanation	Note
Upload Rule	Determine what conditions would archive data to FTP. Any, All, One or Always measurement failed	While the setting is similar to Measurement Fail rule, the result of this rule decide whether the file will be archived to the FTP
Upload Measurement ID	Measurement ID used to determine if archive operation will be triggered	Only available when Upload Rule is set to One measurement
Upload Format	Raw, Picture or both	See FTP Archived File format section for more details
Upload Measurement	Control if measurement results should be uploaded	See FTP Archived File format section for more details
Upload Measurement Format	CSV, XML or CSV & XML	Specify the format of the measurements
Log File Writes	Enable the logging of individual files	When enabled, every file will have an entry in the log. This is useful for debugging, but should be disabled for the execution, as an excessive log can cause instability and performance issues.
Auto Color Scale	Set color scale base on max and min of received data in picture data	If disabled, Color Scale Min and Color Scale Max needs to be filled in
Color Scale Min, Color Scale Max	Max and min of color scale when auto color scale is disabled	Max must be larger than min

If a connection to the sensor or FTP server is dropped during operation, the tool will try to re-establish the connection every one second, or until the service is disabled

## Sensor

Internally the Archive tool communicates with the device it is running on (sensor, accelerator PC, GoMax) via GoSDK. On a sensor and PC, this communication usually does not require explicit configuration as the SDK server can be reached via the loopback IP address (127.0.0.1) configured by default.

On GoMax or in scenarios where the PC accelerator has several NICs, using the default loopback IP address may not work. In those cases, the Sensor IP address has to be set specifically to the address of one of the NIC cards.



☒ Custom Sensor Configuration

Sensor IP: 127.0.0.1

Sensor Control Port: 3190

Sensor Data / Public Port: 3196

Sensor Health Port: 3194

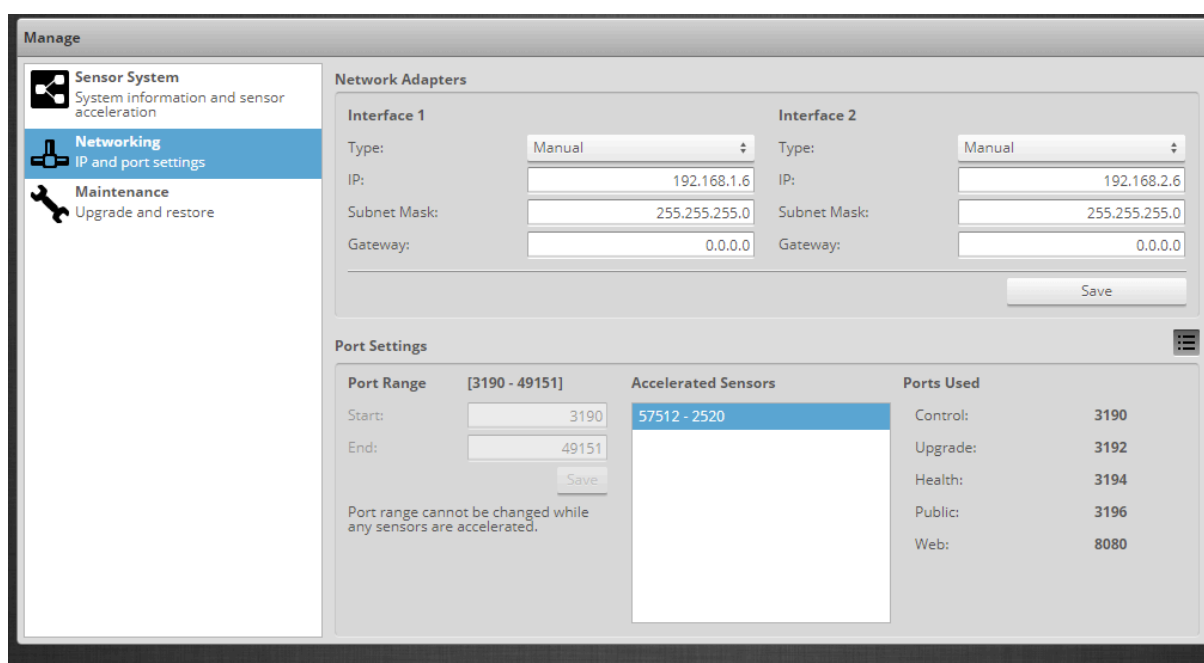
Sensor Upgrade Port: 3192

Parameter	Explanation	Note
Custom Sensor Configuration	Unchecked by default, allows the user to specify a Sensor IP address different from the usual 127.0.0.1 address.	On GoMax, using 127.0.0.1 may not work. In those cases, the Sensor IP address has to be set specifically to the address of one of the GoMax NICs.
Sensor IP	Sensor IP address to connect to	127.0.0.1 for Sensor and running on PC Interface 1 address when running on GoMax
Sensor Control Port	Sensor control port	Default 3190. Should match GoMax's sensor port setting Note that on emulator this could be different if multiple instances are running
Sensor Data /Public Port	Sensor data port (refer to as Public port on GoMax)	Default 3196. Should match GoMax's sensor port setting Note that on emulator this could be different if multiple instances are running
Sensor Health Port	Sensor health port	Default 3194. Should match GoMax's sensor port setting Note that on emulator this could be different if multiple instances are running
Sensor Upgrade	Sensor upgrade port	Default 3192. Should match GoMax's sensor

Port		port setting Note that on emulator this could be different if multiple instances are running
------	--	---

Below is an example on how to match GoMax accelerated sensor setting with the tool Sensor's networking setting

Note: If a server is SFTP and Standard FTP is selected and enabled ,it could take a long time for the standard FTP connection to fail. Enable SFTP before enabling FTP function if SFTP is used.



The screenshot shows the 'Manage' window of the Sensor System. On the left, there's a sidebar with 'Sensor System' (System information and sensor acceleration), 'Networking' (IP and port settings), and 'Maintenance' (Upgrade and restore). The main area is divided into 'Network Adapters' and 'Port Settings'.

**Network Adapters:** Shows two interfaces. Interface 1 and Interface 2 both have a 'Type' of 'Manual'. Interface 1 has IP: 192.168.1.6, Subnet Mask: 255.255.255.0, and Gateway: 0.0.0.0. Interface 2 has IP: 192.168.2.6, Subnet Mask: 255.255.255.0, and Gateway: 0.0.0.0. A 'Save' button is at the bottom right.

**Port Settings:** Shows a 'Port Range' of [3190 - 49151]. The 'Accelerated Sensors' section shows a range of 57512 - 2520. The 'Ports Used' section lists: Control: 3190, Upgrade: 3192, Health: 3194, Public: 3196, and Web: 8080. A 'Save' button is also present.

### 3. Measurements and Features

The measurements reflect the health statistics of the FTP capability. These numbers are updated *only* when the sensor is running and sending data through the measurement pipelines.

#### General

Stats	Explanation
Sensor Service State	Idle (0): Sensor not enabled Connected (1): Connected to sensor Disconnected (2): Sensor connection enable, but couldn't connect to sensor
Sensor State	Detail state information of the sensor (not the sensor service). Online,


	offline, busy etc (i.e. GoState from GoSDK)
FTP State	FTP service state. Same values as Sensor service state  Idle (0): FTP server not enabled Connected (1): Connected to FTP server Disconnected (2): FTP server connection enable, but couldn't connect to sensor
FTP State Reason	None (0) Fail to Connect (1) Fail to Login (2) Failed Ping (3) Connecting (4)
Uptime	Uptime in seconds
Encoder Value	Not used. Will be removed in the future
Frame Count	Frame count received
Archive Count	Number of archive operations. Each frame could have more than one archive operations (i.e. each file write is an operation)
Queue Count	Internal queuing statistics
Archive Success Count	Number of successful archive operations. An archive action could fail due to network or FTP server availability.
Archive Fail Count	Number of unsuccessful archive operations

## 4. Gocator Protocol

The surfaces, profiles, and intensity data to record are received using the Gocator Protocol. To record properly, the Gocator Protocol needs to be enabled, in the Output page. **The Archive tool automatically enables all the required outputs when added.**



**Output**


**Ethernet**  
 Protocol and data selection

**Digital 1**  
 Trigger event and pulse width

**Digital 2**  
 Trigger event and pulse width

**Analog**  
 Trigger event and current scaling

**Serial**  
 Protocol and data selection

**Protocol:** Gocator

**Configuration**  

This protocol uses TCP messages to control the sensor and to transmit data and measurement results to a client computer. Measurements and what type of scan data to send (Video, 3D, Intensity) are user-selectable. 3D data can be in the form of ranges, profiles, or surfaces, depending on the sensor series.

All of the tasks that can be accomplished in the web interface can be accomplished programmatically by sending and receiving the protocol control commands.

☒ **Auto Disconnect**


Auto disconnect if the sensor is unable to send data.

Timeout:  s

**Data**

Send	Name	ID
Surfaces		
<input checked="" type="checkbox"/>	Top	
Surface Intensities		
<input checked="" type="checkbox"/>	Top	
Sections		
<input type="checkbox"/>	Section 1 - Top	
Sections Intensities		
<input type="checkbox"/>	Section 1 - Top	
Measurements		
<input type="checkbox"/>	Archive/Sensor Service State	0
Events		
<input type="checkbox"/>	Exposure End	

**Output**


**Ethernet**  
 Protocol and data selection

**Digital 1**  
 Trigger event and pulse width

**Digital 2**  
 Trigger event and pulse width

**Analog**  
 Trigger event and current scaling

**Serial**  
 Protocol and data selection

**Protocol:** Gocator

**Configuration**  

This protocol uses TCP messages to control the sensor and to transmit data and measurement results to a client computer. Measurements and what type of scan data to send (Video, 3D, Intensity) are user-selectable. 3D data can be in the form of ranges, profiles, or surfaces, depending on the sensor series.

All of the tasks that can be accomplished in the web interface can be accomplished programmatically by sending and receiving the protocol control commands.

☒ **Auto Disconnect**

Auto disconnect if the sensor is unable to send data.

Timeout:  s

**Data**

Send	Name	ID
Profiles		
<input checked="" type="checkbox"/>	Top	
Profile Intensities		
<input checked="" type="checkbox"/>	Top	
Events		
<input type="checkbox"/>	Exposure End	

It is important to enable all Surfaces and Surface Intensities (for surfaces) or Profiles and Profile Intensities (for profiles), since these are required to create a valid REC file. However, if the user changes the selection, if sensors are added or if intensity is enabled after the addition of the Archive tool, the user can use the **Operation** called **Update Outputs** in the Archive tool to re-enable the necessary outputs.

**Output**

**Ethernet**  
Protocol and data selection

**Digital 1**  
Trigger event and pulse width

**Digital 2**  
Trigger event and pulse width

**Analog**  
Trigger event and current scaling

**Serial**  
Protocol and data selection

Protocol: Gocator

**Configuration**

This protocol uses TCP messages to control the sensor and to transmit data and measurement results to a client computer. Measurements and what type of scan data to send (Video, 3D, Intensity) are user-selectable. 3D data can be in the form of ranges, profiles, or surfaces, depending on the sensor series.

All of the tasks that can be accomplished in the web interface can be accomplished programmatically by sending and receiving the protocol control commands.

☒ **Auto Disconnect**

Auto disconnect if the sensor is unable to send data.  
Timeout: 10 s

**Surfaces and Measurements are archived**

**Data**

Send	Name	ID
<b>Surfaces</b>		
<input checked="" type="checkbox"/>	Top	
<b>Measurements</b>		
<input checked="" type="checkbox"/>	Surface Blob/Count	0
<input checked="" type="checkbox"/>	Surface Blob/X Center 1	2
<input checked="" type="checkbox"/>	Surface Blob/Y Center 1	4
<input checked="" type="checkbox"/>	Surface Blob/Width 1	3
<input checked="" type="checkbox"/>	Archive/Sensor Service State	1
<input checked="" type="checkbox"/>	Archive/Sensor State	5
<input checked="" type="checkbox"/>	Archive/Up time	7
<input checked="" type="checkbox"/>	Archive/Frame Count	6
<b>Events</b>		
<input type="checkbox"/>	Exposure End	
<b>Features</b>		
<input checked="" type="checkbox"/>	Surface Blob/Center Point 1	0
<b>Tool Data</b>		
<input checked="" type="checkbox"/>	Surface Blob/Blobs Array	0

Other data types are ignored

Note that all measurements needed by the Archive tool, either for triggering the archiving of a recording, or for archiving them in the measurements file, have to also be enabled. Since these are specific to the application, only the user can do this, manually. The Archive tool will ignore all data types in the Ethernet Output page other than Surfaces and Measurements.

## 5. FTP Archived File Format

Data that passes the FTP upload rule will be archived. An archive record, containing stamps, measurements and height information are always uploaded when the FTP upload rule is met.

All modes are currently supported by the tool, i.e. uniform and non-uniform profiles and surfaces.

For uniform surface height maps, users can choose to also in picture format which allows users to get a visual representation of the surface data. The table below describe the archived file formats

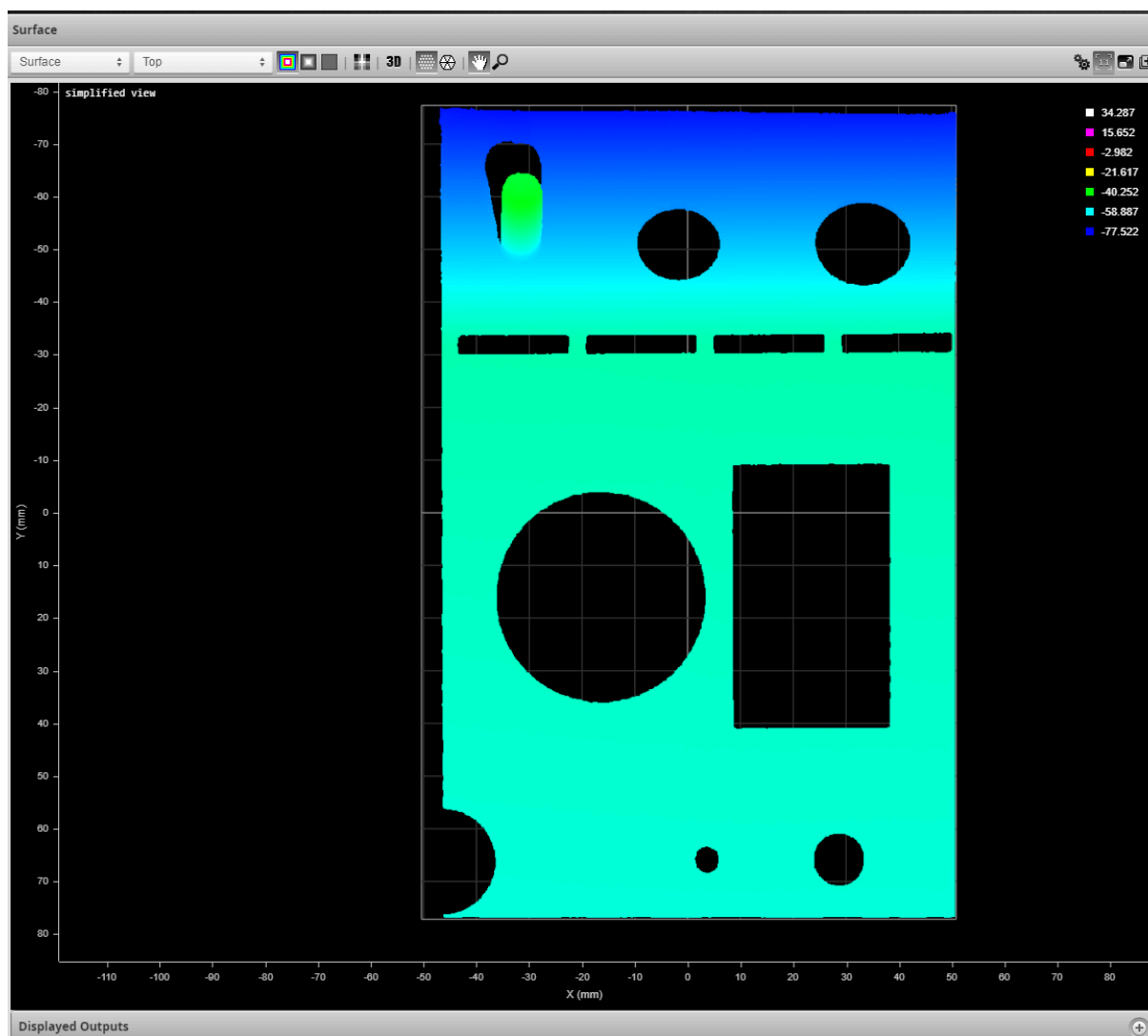
Data Type	Format Type	Explanations
Archive record (.rec)	rec	<p>Each rec file is a complete record of the frame. It contains all the data (surface/profile/intensity data) required to replay the actual frame. The rec file also has the full job file configured, as it was when starting the execution.</p> <p>The data can be loaded back on the sensor or on the emulator using the normal Replay mode. Note that to be able to use the rec file in the emulator, a proper scenario has to be loaded first. A scenario can be saved from the sensor by exporting a support file (gs file) and to import this support file in the emulator.</p>

Surface Height Map (Uniform)	Picture	24-bit bmp. Each pixel is a pseudo color value (same color rainbow scale as in Gocator Firmware). The last Y (encoder) position is at row 0 (i.e. vertically flip from the data received from the Gocator Data Protocol)
Measurements	XML or CSV	XML or CSV of the measurement results.

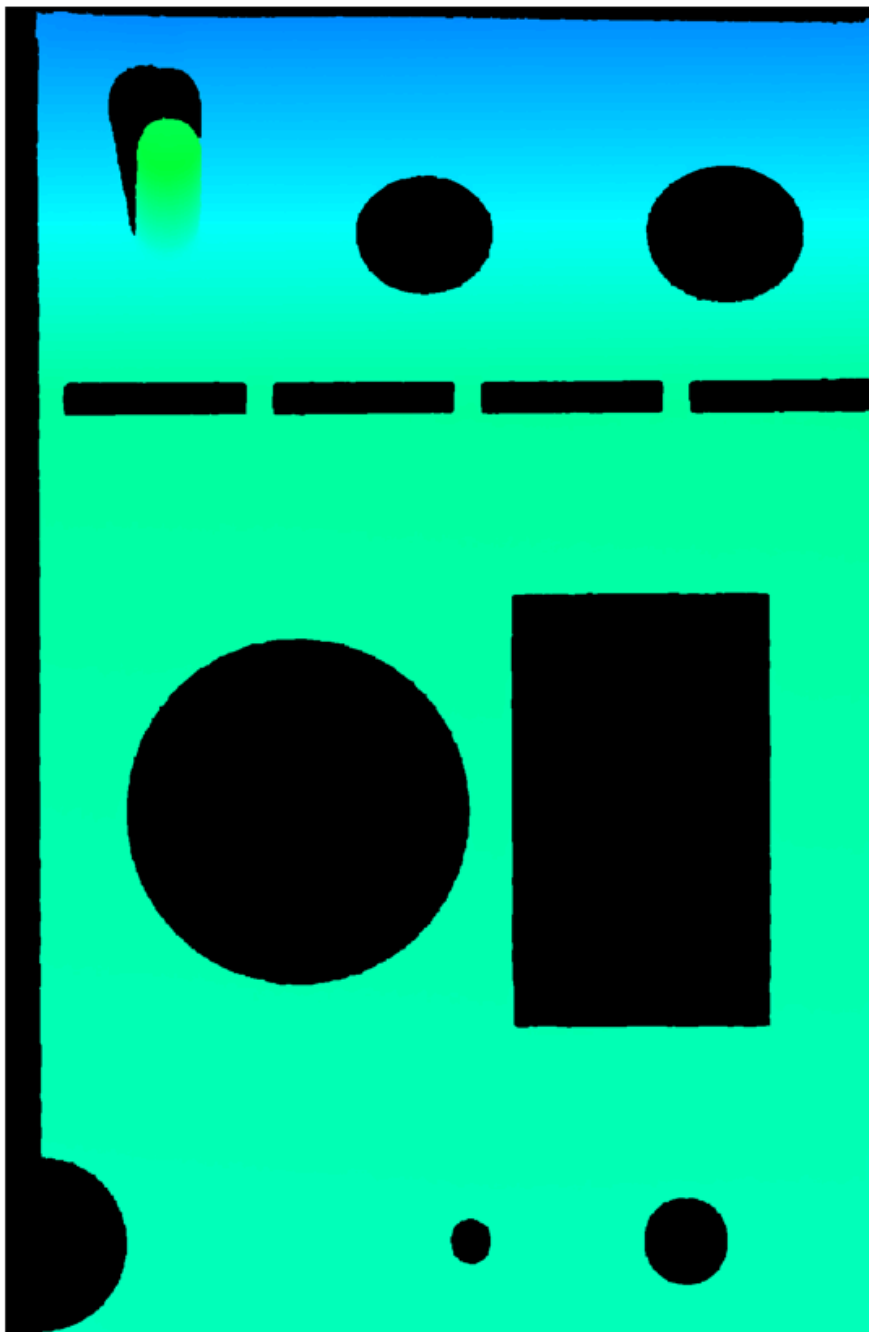
Note: Measurements and Pictures could take a significant amount of CPU to generate when the system is running in real-time. Users could only store the archive record (.rec) and regenerate these results in offline mode

## 6. Application Example

Visualizer in Gocator UX



Picture Data Format (when viewing with Windows Paint)



Note that the color scheme may not be exactly the same as in the Gocator UX.

## 7. Replaying frames

Frames are recorded as rec files, and contain a single frame per file. The file can be loaded back on the sensor or on the emulator using the normal Replay mode.

### On sensor

If you use the same sensor that was used for generating the rec files, it is possible to just reload the rec file from it and enable the replay mode. At that point, the frame is displayed and all the tools should be executed on that current frame.

### On Emulator

It is possible to reload the rec file in the emulator, but a proper scenario has to be loaded first. A scenario can be saved from the sensor by exporting a support file (gs file) and to import this support file in the emulator. When the support file is loaded in the emulator, a new rec file can be loaded by disabling the Replay Protection. As on sensor, once the rec file is loaded, the tools should be executed on the current frame.

## 8. Replaying multiple frames at once

To avoid loading each file separately, we provide a tool, called **GoReplayUtils.exe** (in the **6.x.x.x\_SOFTWARE\_Gocator\_Private\_Tools** package), which can be used to merge multiple frames into a single rec file. It is important to note that the rec files **MUST** have been created with the exact same settings before being merged. If something is different (intensity enabled/disabled, surface/profile mode), either the merge process will fail, or the merged rec file will be corrupted and won't be loadable.


The **GoReplayUtils.exe** can be called from the command prompt, using the -m command-line options. For example, the following command will merge all the .rec files in a folder into a single merged.rec file, using wildcards (\*, ?):

```
GoReplayUtils.exe -m "C:\FTP_data\ng\*.rec" C:\FTP_data\ng\merged.rec"
```

After the "merged.rec" file is created, it can now be reloaded in the same way as explained in the section Replaying Frames, but will now contain all the frames that were merged together. The user can just step through the frames one at a time.

## References

1. Tan easy way to test the tool with a computer only

 VE: Setup local FTP server and FTP client in Windows 10 to ease tests with the Ar...