

# Eagle™ TraceServer™

## Centralized Data Collection Program

The Eagle TraceServer data collection software records valuable production data and machine status information from one or more Eagle Product Inspection x-ray devices and consolidates it into a single centralized database.

Eagle TraceServer can be installed on a standalone PC or on a network server to provide visibility to the information and operation of the x-ray systems. Data can be accessed from customer provided programs using standard SQL application programming interfaces for integration into other production control and quality programs.

A standard Eagle TraceViewer™ software program is provided with each TraceServer package, this feature allows for information to be viewed, printed and exported.

The Eagle TraceServer provides the user with access to critical production and inspection information. Key functionality includes:

- Valuable information consolidated into a centralized database
- Viewing, printing, and exporting of data and results
- Ability to access data from other programs using standard SQL application interfaces



# Eagle TraceServer™

## Centralized Data Collection Program

The Eagle TraceServer™ consists of the following components and services:

TraceServer	A server program that resides on a PC or network server. Connects multiple Eagle x-ray machines to record, store and display production data, implemented as a Windows service.
TraceServer Admin	A software application used to configure TraceServer and monitor the status of the connected machines.
TraceViewer	A software application that allows basic queries on the TraceServer database to view, print, or export queried data.
Postgre SQL	The database management system supplied as standard with TraceServer to store the production data. The program can also be used with customer provided Microsoft SQL Server.

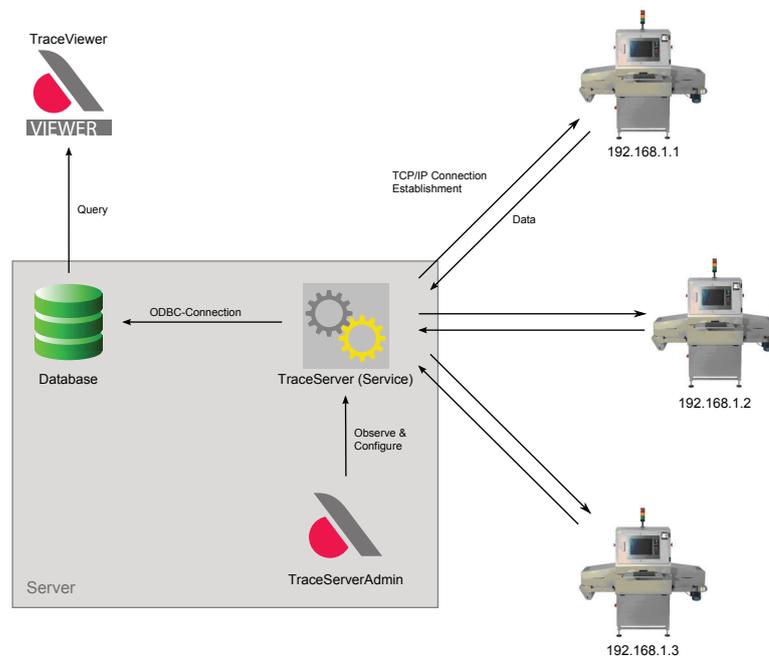


Figure 1: TraceServer Topology

### TraceServer Admin

TraceServer Admin allows configuration of the TraceServer and provides continual status monitoring of each Eagle x-ray machine connected. Figure 2 on the following page illustrates an example of a TraceServer Admin user interface monitoring nine individual machines simultaneously.

Each machine's status (1) is shown on the left side of the screen. As inspection operations change, the user has the ability to add or delete machines (2). The machine status displays when there is a good connection between the machine and TraceServer, as well as during other important machine operations including "X-ray On", "Belt Running", "Machine Warning/Fault", "Machine Normalizing" and "Machine Processing".

In the center of the screen is the Log which displays information of the various events which have occurred. The events are classified (3) into four categories:

- (I) **Info**: general information which has occurred (e.g. new table created)
- (E) **Error**: an error has occurred during operation (e.g. consecutive reject limit exceeded)
- (M) **Machine Event**: a machine sent an event based message (e.g. batch complete)
- (O) **ODBC**: messages from the database

Machine information may be viewed (4) individually or simultaneously with other connected machines where further segmenting of the data into tabs by Info, Error, Machine Event, and ODBC (5) comes standard as another convenient feature for the user. The user interface can display up to 256 log entries (6) based on a FIFO (first-in-first-out) format. All log entries are retained in the database and can be retrieved, viewed, and exported from the program simply by choosing the “Reveal Log Files” from the “File” menu.

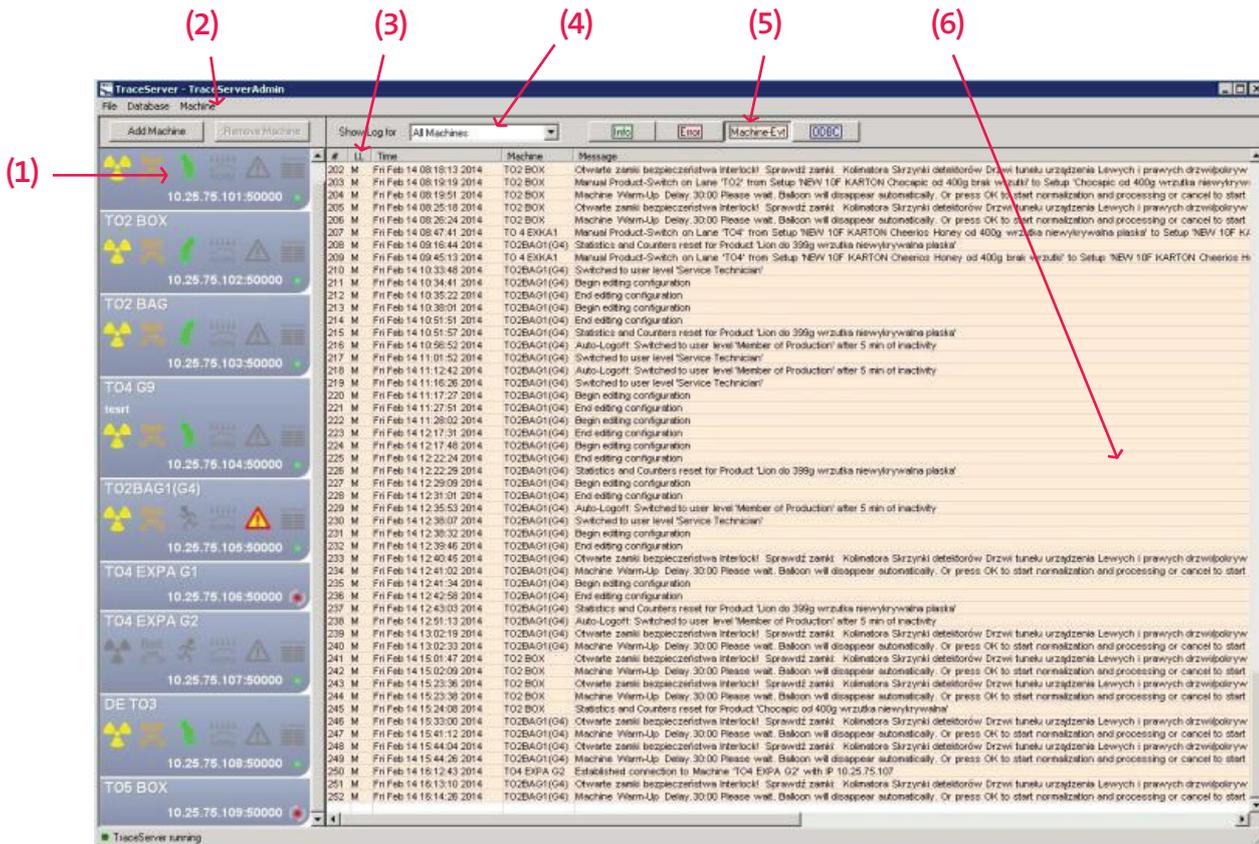


Figure 2: TraceServer Admin User Interface Example

## TraceViewer User Interface

TraceViewer is a standard software application which enables users to query the TraceServer database to view, report and export data. The program can be installed either on the server where TraceServer is located or on a separate client PC. Multiple TraceViewer programs can be installed for accessing the data in a single TraceServer database thereby unlocking the available information to more users. The TraceViewer user interface (Figure 3) provides the user with a wealth of information in an easy

to use format. Filters (7) are available to deliver a focused view of data and results. The filter selections include: Machine, Lane, Product, Batch, Time Span, and Bar Code Number. Navigation tabs (8) allow the user to switch views in order to quickly view system configuration and performance. Descriptions for each view are in the next section. Displayed information can be viewed (9) by “Rejects Only”, “Accepts Only”, or “All Objects”. Further all rejected items are color coded in red shaded rows (10), with the type of reject listed (e.g. Contaminant, Weight, etc.) for easy identification.

## TraceViewer Main Navigation Tabs

**Machines:** Information including Name, IP Address, and Serial Number. A sub-tab also enables the user to view the Events Log by individual machine or for all machines connected.

**Lanes:** Eagle x-ray machines can be set-up for single or multi-lane operation. This tab shows what products are associated with specific machine lanes.

**Products:** Provides information on each product which is associated with the query including throughput, accept, and reject counts.

**Batches:** Product and Batch ID are displayed and include start and end times along with their completion date and total number of products accepted.

The screenshot shows the TraceViewer application interface. On the left, there are 'Active Filters' for Machines, Lanes, Products, and Batches. The main area displays a table of data with columns: Object ID, Product, Time, Throughput, Barcode, Rejecter, Image, and Value. A callout box labeled (8) shows a zoomed-in view of the 'Navigation Tabs' (Machines, Lanes, Products, Batches, Objects, Images, Values) and the 'Display Value' dropdown set to 'Container Weight (Generic Pouch)'. Below this, a smaller table shows a list of objects with columns: Object ID, Product, Time, and Throughput. Red arrows point to: (7) the Active Filters section, (8) the Navigation Tabs, (9) the 'Accepts' and 'Rejects' buttons, and (10) the 'Value' column in the main table.

Object ID	Product	Time	Throughput
1	Generic Pouch	2/19/2014 2:47:34 PM	1
2	Generic Pouch	2/19/2014 2:47:34 PM	2
3	Generic Pouch	2/19/2014 2:47:34 PM	3
4	Generic Pouch	2/19/2014 2:47:34 PM	4
5	Generic Pouch	2/19/2014 2:47:34 PM	5
6	Generic Pouch	2/19/2014 2:47:37 PM	6
7	Generic Pouch	2/19/2014 2:47:38 PM	7
8	Generic Pouch	2/19/2014 2:47:40 PM	8
9	Generic Pouch	2/19/2014 2:47:42 PM	9
10	Generic Pouch	2/19/2014 2:47:44 PM	10
11	Generic Pouch	2/19/2014 2:47:45 PM	11
12	Generic Pouch	2/19/2014 2:47:46 PM	12
13	Generic Pouch	2/19/2014 2:47:48 PM	13
14	Generic Pouch	2/19/2014 2:47:50 PM	14
15	Generic Pouch	2/19/2014 2:55:48 PM	1
16	Generic Pouch	2/19/2014 2:55:48 PM	2
17	Generic Pouch	2/19/2014 2:55:48 PM	3
18	Generic Pouch	2/19/2014 2:55:48 PM	4
19	Generic Pouch	2/19/2014 2:55:48 PM	5
20	Generic Pouch	2/19/2014 2:55:51 PM	6
21	Generic Pouch	2/19/2014 2:55:52 PM	7
22	Generic Pouch	2/19/2014 2:55:54 PM	8
23	Generic Pouch	2/19/2014 2:55:55 PM	9
24	Generic Pouch	2/19/2014 2:55:57 PM	10
25	Generic Pouch	2/19/2014 2:55:58 PM	11
26	Generic Pouch	2/19/2014 2:56:00 PM	12
27	Generic Pouch	2/19/2014 2:56:01 PM	13
28	Generic Pouch	2/19/2014 2:56:03 PM	14
29	Generic Pouch	2/19/2014 2:56:04 PM	15
30	Generic Pouch	2/19/2014 2:56:06 PM	16
31	Generic Pouch	2/19/2014 2:56:07 PM	17
32	Generic Pouch	2/19/2014 2:56:09 PM	18
33	Generic Pouch	2/19/2014 2:56:10 PM	19
34	Generic Pouch	2/19/2014 2:56:12 PM	20
35	Generic Pouch	2/19/2014 2:56:13 PM	21
36	Generic Pouch	2/19/2014 2:56:15 PM	22
37	Generic Pouch	2/19/2014 2:56:16 PM	23
38	Generic Pouch	2/19/2014 2:56:18 PM	24
39	Generic Pouch	2/19/2014 2:56:19 PM	25
40	Generic Pouch	2/19/2014 2:56:21 PM	26
41	Generic Pouch	2/19/2014 2:56:22 PM	27
42	Generic Pouch	2/19/2014 2:56:24 PM	28
43	Generic Pouch	2/19/2014 2:56:25 PM	29
44	Generic Pouch	2/19/2014 2:56:27 PM	30
45	Generic Pouch	2/19/2014 2:56:29 PM	31
46	Generic Pouch	2/19/2014 2:56:30 PM	32
47	Generic Pouch	2/19/2014 2:56:32 PM	33

Figure 3: TraceViewer User Interface

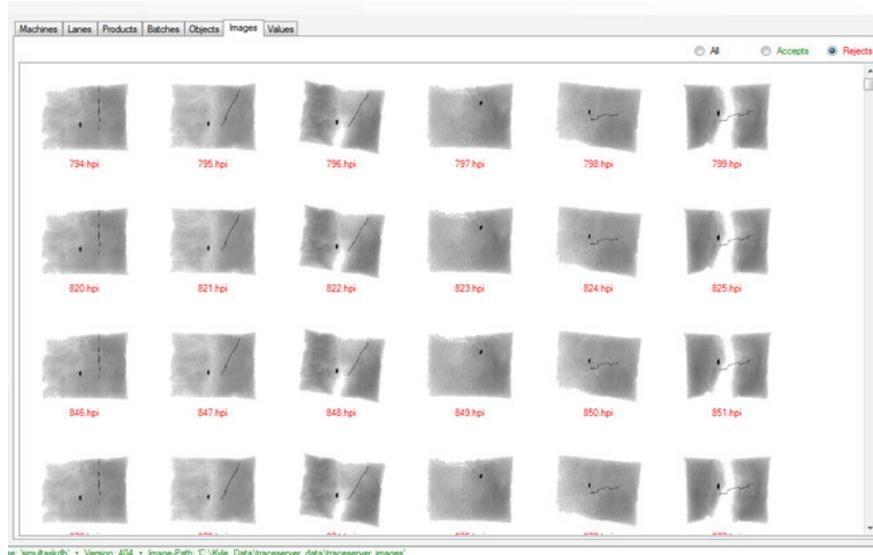


Figure 4: TraceViewer Images Tab

**Objects:** By enabling the “Save Images” function, this view provides information on each object which has passed through the x-ray including the image file name of the object.

**Images:** Each image saved to the database is accessible through this tab (Figure 4). The images are further filtered to show all Accepts, all Rejects, or all Stored images. This feature also allows the user to view expanded image of each file for further analysis.

Client ID	Product	Time	Throughput	Barcode	Rejecter	Image	Value
1	Generic Pouch	2/19/2014 2:47:34 PM	1		Containment		289.38
2	Generic Pouch	2/19/2014 2:47:34 PM	2		Containment		289.59
3	Generic Pouch	2/19/2014 2:47:34 PM	3		Containment		289.57
4	Generic Pouch	2/19/2014 2:47:34 PM	4		Containment		300.25
5	Generic Pouch	2/19/2014 2:47:34 PM	5		Containment		301.25
6	Generic Pouch	2/19/2014 2:47:37 PM	6		Containment		301.78
7	Generic Pouch	2/19/2014 2:47:39 PM	7		Containment		273.00
8	Generic Pouch	2/19/2014 2:47:40 PM	8		Containment		275.42
9	Generic Pouch	2/19/2014 2:47:42 PM	9		Containment		275.17
10	Generic Pouch	2/19/2014 2:47:44 PM	10		Containment		277.63
11	Generic Pouch	2/19/2014 2:47:45 PM	11		Containment		274.18
12	Generic Pouch	2/19/2014 2:47:47 PM	12		Containment		273.08
13	Generic Pouch	2/19/2014 2:47:48 PM	13		Containment		276.76
14	Generic Pouch	2/19/2014 2:47:50 PM	14		Containment		274.27
15	Generic Pouch	2/19/2014 2:55:48 PM	1		Containment		289.38
16	Generic Pouch	2/19/2014 2:55:48 PM	2		Containment		289.59
17	Generic Pouch	2/19/2014 2:55:48 PM	3		Containment		289.57
18	Generic Pouch	2/19/2014 2:55:48 PM	4		Containment		300.25
19	Generic Pouch	2/19/2014 2:55:48 PM	5		Containment		301.25
20	Generic Pouch	2/19/2014 2:55:51 PM	6		Containment		301.78
21	Generic Pouch	2/19/2014 2:55:52 PM	7		Containment		273.00
22	Generic Pouch	2/19/2014 2:55:53 PM	8		Containment		275.42
23	Generic Pouch	2/19/2014 2:55:55 PM	9		Containment		275.17
24	Generic Pouch	2/19/2014 2:55:57 PM	10		Containment		277.63
25	Generic Pouch	2/19/2014 2:55:58 PM	11		Containment		274.18
26	Generic Pouch	2/19/2014 2:56:00 PM	12		Containment		273.08
27	Generic Pouch	2/19/2014 2:56:01 PM	13		Containment		276.76
28	Generic Pouch	2/19/2014 2:56:03 PM	14		Containment		274.27
29	Generic Pouch	2/19/2014 2:56:04 PM	15		Containment		278.34
30	Generic Pouch	2/19/2014 2:56:06 PM	16		Containment		274.00
31	Generic Pouch	2/19/2014 2:56:07 PM	17		Containment		297.51
32	Generic Pouch	2/19/2014 2:56:09 PM	18		Containment		266.43
33	Generic Pouch	2/19/2014 2:56:10 PM	19		Containment		284.33
34	Generic Pouch	2/19/2014 2:56:12 PM	20		Containment		293.33
35	Generic Pouch	2/19/2014 2:56:13 PM	21		Containment		293.78
36	Generic Pouch	2/19/2014 2:56:15 PM	22		Containment		284.92
37	Generic Pouch	2/19/2014 2:56:16 PM	23		Containment		293.60
38	Generic Pouch	2/19/2014 2:56:18 PM	24		Containment		298.48
39	Generic Pouch	2/19/2014 2:56:19 PM	25		Containment		298.52
40	Generic Pouch	2/19/2014 2:56:21 PM	26		Containment		296.90

Figure 5: Values Tab - List

**List:** Listing of each item scanned with their individual Product ID, Time & Date, Bar Code (if used), Reject Type, Image File, and Value selected listed.

**Values:** There are numerous values which can be captured using an Eagle x-ray system. The Values Tab allows you to view the results based on the value type you want to see in detail (e.g. Weight/Mass). The four sub-tabs: List (Figure 5), Values (Figure 6), Timeline (Figure 7) and Histogram (Figure 8) deliver the production data and summary information based on the value type selected which Operations, Quality, and even Maintenance personnel will find very beneficial.

Container Weight (Generic Pouch)

Value Type: 5-Zone Weight  
 Total: 227042.3 g (Qty: 793)  
 Accepted: 172941.5 g (Qty: 607)  
 Rejected: 54100.8 g (Qty: 186)  
 - Above Nominal: 54100.8 g (Qty: 186)  
 - Below Nominal: 0.0 g (Qty: 0)  
 Mean Weight: 286.3 g  
 Standard Deviation: 11.0 g (3.8 %)  
 Net Giveaway: 6206.5 g  
 Net Giveaway %: 2.6 %  
 Min Value: 270.4 g  
 Max Value: 301.8 g

	Wed, 19 Feb 2014 2:47:34 PM - Wed, 19 Feb 2014 3:15:21 PM		Rejected	
	Qty	Weight	Qty	Weight
High Reject	0	0.0 g	93	28000.7 g
High Accept	149	44305.1 g	0	0.0 g
Nominal	242	69635.1 g	93	26100.1 g
Low Accept	216	59001.3 g	0	0.0 g
Low Reject	0	0.0 g	0	0.0 g
<b>Totals</b>	<b>607</b>	<b>172941.5 g</b>	<b>186</b>	<b>54100.8 g</b>

Figure 7: Values Tab - Timeline Chart

**Timeline:** The Timeline chart shows process performance over time, scalable for both short and long term trends.

Container Weight (Generic Pouch)

Value Type: 5-Zone Weight  
 Total: 227042.3 g (Qty: 793)  
 Accepted: 172941.5 g (Qty: 607)  
 Rejected: 54100.8 g (Qty: 186)  
 - Above Nominal: 54100.8 g (Qty: 186)  
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 Mean Weight: 286.3 g  
 Standard Deviation: 11.0 g (3.8 %)  
 Net Giveaway: 6206.5 g  
 Net Giveaway %: 2.6 %  
 Min Value: 270.4 g  
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Low Accept	216	59001.3 g	0	0.0 g
Low Reject	0	0.0 g	0	0.0 g
<b>Totals</b>	<b>607</b>	<b>172941.5 g</b>	<b>186</b>	<b>54100.8 g</b>

Figure 6: Values Tab - Overview

**Overview:** Summary counters and statistics are provided for the number of accepts, rejects and standard deviation. It also calculates giveaway, range, plus counts and totals by zones.



Figure 8: Values Tab - Histogram Chart

**Histogram:** The Histogram chart delivers concise visualization of the process results.

## TraceViewer Main Data Output

TraceViewer can deliver a standardized report (Figure 9) in a .pdf format for viewing, printing, and archiving. Summary information includes counter totals (11),

weight statistics (12), statistics by zone (13) and snapshots (14) of the Timeline and Histogram Charts. Additionally individual item data can be exported from TraceViewer in .csv file format (Figure 10).

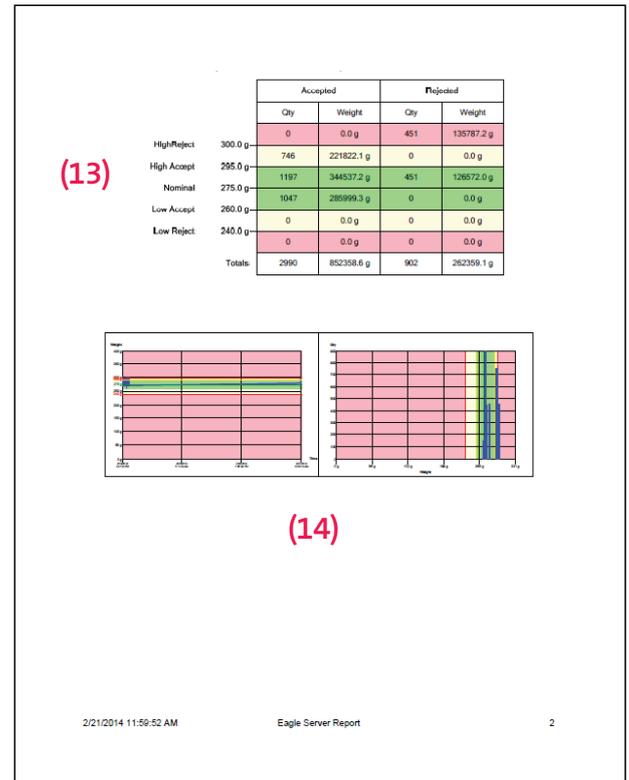
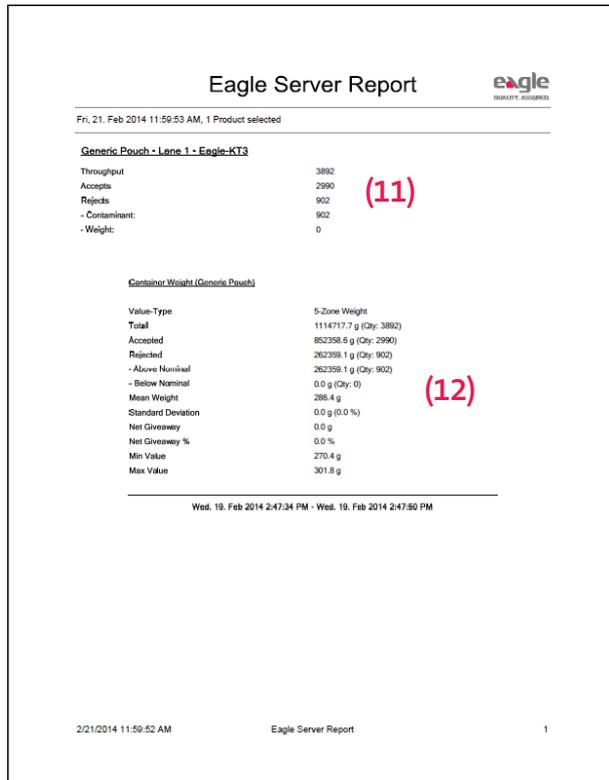


Figure 9: Eagle TraceViewer Summary Report

Object-ID	Product	Time	Throughput	Barcode	Rejecter	Image	Container Weight [g]
1	790 Generic Pouch	2014-02-19T15:15:16	1				294.9159249
2	791 Generic Pouch	2014-02-19T15:15:18	2				293.601741
3	792 Generic Pouch	2014-02-19T15:15:19	3				298.4813402
4	793 Generic Pouch	2014-02-19T15:15:21	4				295.5166469
5	794 Generic Pouch	2014-02-19T15:15:24	5		Contaminant	images_2014_02_19\794.hpi	280.3773822
6	795 Generic Pouch	2014-02-19T15:15:25	6		Contaminant	images_2014_02_19\795.hpi	280.5947674
7	796 Generic Pouch	2014-02-19T15:15:27	7		Contaminant	images_2014_02_19\796.hpi	280.9663533
8	797 Generic Pouch	2014-02-19T15:15:28	8		Contaminant	images_2014_02_19\797.hpi	300.2495093
9	798 Generic Pouch	2014-02-19T15:15:30	9		Contaminant	images_2014_02_19\798.hpi	301.2476755
10	799 Generic Pouch	2014-02-19T15:15:31	10		Contaminant	images_2014_02_19\799.hpi	301.7522493
11	800 Generic Pouch	2014-02-19T15:15:33	11				273.0004968
12	801 Generic Pouch	2014-02-19T15:15:34	12				270.4213681
13	802 Generic Pouch	2014-02-19T15:15:36	13				273.1717507
14	803 Generic Pouch	2014-02-19T15:15:37	14				277.6296849
15	804 Generic Pouch	2014-02-19T15:15:39	1				274.1811898
16	805 Generic Pouch	2014-02-19T15:15:40	2				273.0608618
17	806 Generic Pouch	2014-02-19T15:15:42	3				276.7833232
18	807 Generic Pouch	2014-02-19T15:15:43	4				274.2732136
19	808 Generic Pouch	2014-02-19T15:15:45	5				278.3400158
20	809 Generic Pouch	2014-02-19T15:15:46	6				273.9967632
21	810 Generic Pouch	2014-02-19T15:15:48	7				297.5063655
22	811 Generic Pouch	2014-02-19T15:15:49	8				298.4286541
23	812 Generic Pouch	2014-02-19T15:15:51	9				294.3278791
24	813 Generic Pouch	2014-02-19T15:15:52	10				293.3338156
25	814 Generic Pouch	2014-02-19T15:15:54	11				293.7568617
26	815 Generic Pouch	2014-02-19T15:15:55	12				294.9159249
27	816 Generic Pouch	2014-02-19T15:15:57	13				293.601741
28	817 Generic Pouch	2014-02-19T15:15:58	14				298.4813402

Figure 10: TraceViewer Data Export in .csv Format

## Recordable Data

Model	Eagle TraceServer™ V4.0.6
Machine Data	Time & Date, Machine Logs & Events, Reject On Input (external signal from another sensor/device to initiate the x-ray reject)
Lanes & Products	Data by lane (if multi-lane operation) and by product from all connected / selected machines.
Batches	Batch ID, Product Name, Start/End Time, Batch Number, Identifier, Charge Number, Number of Inspected Packages/Objects, Measurement Criteria (e.g. weight, count, etc.)
Sub-Batches / Partitions	ID, Start/End Time, Value, Sum & Count
Package / Object Data	Batch & Product/Object ID, Throughput Number, Bar Code (if used), Rejecter (if rejected), Stored Images, & Sub-Batch Partition.
Reject Reasons	User definable Reject Reasons (e.g. missing premium/prize or insufficient item count) configured in SimulTask 4 for transmission and recording in TraceServer.
Images	No Images Captured, Reject Only, Good Only, or All Images selections configured within SimulTask 4 for transmission and recording in TraceServer.
Values	Values are either listed or graphically represented in a histogram, timeline, or tabular overview format for data values including Zone Totals, Average Weight, Standard Deviation, Net Giveaway, Weight, & Count. Additional values for Fat Analysis systems include Chemical Lean (CL), CL-Weight, Protein, & Moisture.

## Remote Monitoring

Monitoring Program	TraceServer Admin program running on TraceServer machine
Machine Status	X-ray On/Off, Belt On/Off, System Processing, System Normalizing, & Error Conditions
System Logs	System Information, Machine Events, Database Messages, Operational Errors

## System Specifications

Machine Compatibility	Eagle x-ray machines with SimulTask™ 4 Image Processing and Control Software Version 4.23.0 or greater
Machine Connections <sup>1</sup>	Up to 32 Eagle x-ray machines can be attached to a single TraceServer installation
Database <sup>2</sup>	Postgre SQL 9.2 or higher supplied with TraceServer also compatible with Microsoft SQL Server versions 2008 (R2) through 2019.
Server Requirements <sup>3, 4</sup>	Compatible with Windows Server OS from versions 2008 (R2) through 2019, Intel Dual Core ≥2GHz or higher with ≥4GB of RAM; ≥500GB hard drive free space, 1024 X 768 Display resolution; CD-ROM drive and 100 Mbps Ethernet minimum required, latest Microsoft Server OS with GigE (1 Gigabit Ethernet) & 16GB RAM recommended. A virtual server machine environment can be used.
Client Program	Eagle TraceViewer V1.3 is a standard pre-configured client software program supplied with TraceServer for viewing, exporting, and printing of information contained within TraceServer. TraceViewer exports can be .pdf, printed or stored as .csv files for further processing by external programs.
TraceViewer Client Requirements <sup>4</sup>	Windows 8.1 or Windows 10 Professional or Enterprise Versions, Intel Dual Core ≥2GHz or higher with ≥2GB of RAM; ≥20GB hard drive free space; DirectX 9 or greater graphics card with WDDM1.0 driver, 1024 X 768 Display resolution; CD-ROM drive, 100 Mbps Ethernet required/ 1GigE recommended, Adobe Reader V9.0 or greater & Microsoft Excel 2003 or greater
Scope of Supply <sup>2,3,4,5</sup>	Application software for PC/Network, Ethernet TCP/IP connection interface for Eagle x-ray machine

<sup>1</sup> May be limited to less than shown based on customer supplied computer, servers, network traffic, configuration, capacity and topology

<sup>2</sup> Microsoft SQL Server is not supplied with TraceServer by Eagle PI; it must be purchased, installed and configured separately by customer

<sup>3</sup> Minimum system requirements to support 3 to 5 machines connected; larger installation will require additional server performance and storage capacity

<sup>4</sup> Server and client computers, network connections, routers, hubs and cabling are not included; they are supplied & prepared by the customer

<sup>5</sup> Integration to 3rd party programs are not included; they must be created, supplied and supported by customer

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