Alinity-ci Operational Data Recorder (ODR) Consumer API

Purpose

The Q Operational Data Recorder (ODR) is a repository for storing Q instrument operational data. The operational data can be used for analytics at the Enterprise. This document describes the exposed interface that consumers can use to query and retrieve data from the ODR.

2 Overview

The ODR aggregates and stores data coming from a Alinity-ci SCC or instrument. The Alinity-ci SCC and instrument are referred to as data producers. The data are retrieved or consumed by various entities at the Abbott Enterprise. These entities are called the data consumers.
The Operational Data Recorder (ODR) Design page describes the high level design details of the ODR, aka Data Manager, in relation to the data producers and consumers.

3 Consumer API

The ODR exposes a Consumer API to allow data consumers to access its data. The Consumer API is based on the Microsoft OData V3 Protocol Specification. OData is built upon web technologies such as HTTP, Atom Publishing Protocol (AtomPub), and JSON to provide access to information stores (http://www.odata.org/).

- Web interface for requesting data
- Based on REST API
- Support for ad-hoc queries

An understanding of the OData query convention is required to access the ODR data.

3.1 Basic OData Query

An OData query has three main parts:

- Service Root URL

- Resource Path
- Query Options

The *service root* specifies the location where the ODR OData service is hosted. For example, the following service root is used by the ODR

```
http://localhost:11000/ODR.svc
```

The *service root* URL can be modified in the *ConsumerService* configuration settings located in the *ICQDataManager.config* file.

```
"ConsumerService":
{
"ServiceAddress": "http://localhost",
"ServicePort": 11000,
"ServiceName": "ODR.svc"
}
```

The *resource path* specifies the data (resource names) that are to be retrieved from the ODR. An example of a resource path is as follows

```
Result(1L)/LLD
```

Retrieve all *LLD* records for *Result* record with primary key equal to one (1). *Result* and *LLD* are resource names.

Note: Resource and field names are case-sensitive.

The *query options* specify the filters that can be applied to the result set. For example:

```
?top=10
```

Putting everything together, the following example query retrieves top 10 *LLD* records related to the *Result* record with primary key of 1:

```
http://localhost:11000/ODR.svc/Result(1L)/LLD?top=10
```

Note: Primary keys are 64-bit values. Therefore, the letter L must be appended to the value, e.g. 3L, when specifying primary key values.

More information about OData query conventions can be found at: OData v3

3.2 Data Projection

A subset of data can be projected using the *$select* query option. This allows the query to retrieve only the data that is required from a record.

Example 1: Retrieve the *TestId* and the *ReportedResult* from all *Result* record:

```
http://localhost:11000/ODR.svc/Result?$select=TestId,ReportedResult
```

3.3 Query Join

OData supports simple joins between two related resources in a query. A join is specified by the *$expand* query option.

Example 1: Retrieve the *InstrumentWorkcell* record related to a *Result* record:

```
http://localhost:11000/ODR.svc/Result(1L)?$expand=InstrumentWorkcell
```

Example 2: Retrieve all *Result* records for an *InstrumentWorkcell*:

```
http://localhost:11000/ODR.svc/InstrumentWorkcell(1L)?$expand=Result
```

Data projection can be used in combination with query join to retrieve only required data.

Example 3: Retrieve the *TestId* of the *Result* record and the related *InstrumentWorkcell* SerialNumber:

```
http://localhost:11000/ODR.svc/Result?$select=TestId,InstrumentWorkcell/SerialNumber&$expand=InstrumentWorkcell
```

Example 4: Retrieve all attributes of the *Result* record and the related *InstrumentWorkcell* SerialNumber:

```
http://localhost:11000/ODR.svc/Result?$select=*,InstrumentWorkcell/SerialNumber&$expand=InstrumentWorkcell
```

3.4 Date/Time Query

The *datetimeoffset* modifier is used in a query to filter records by date and time.

Example 1: Retrieve all *Result* records before September 12, 2013:

```
http://localhost:11000/ODR.svc/Result?$filter=DateTimeStamp le datetimeoffset’2013-09-12’
```

Example 2: Retrieve all *Result* records after noon on September 12, 2013:

```
http://localhost:11000/ODR.svc/Result?$filter=DateTimeStamp ge datetimeoffset’2013-09-12T12:00:00’
```

Example 3: Retrieve all *Result* records after on September 12, 2013:

```
http://localhost:11000/ODR.svc/Result?$filter=DateTimeStamp eq datetimeoffset’2013-09-12’
```

Example 4: Retrieve all *Result* records between 8AM and 8 PM on September 12, 2013:

```
http://localhost:11000/ODR.svc/Result?$filter=DateTimeStamp ge datetimeoffset’2013-09-12T08:00:00’ and
DateTimeStamp le datetimeoffset’2013-09-12T20:00:00’
```

4 Data Model

The ODR Data Model describes the resources (data records) and fields (data columns) that can be accessed from the ODR. This section describes the data that are supported by the Alinity-ci ODR.

4.1 Data Model Conventions

4.1.1 Enumerated Fields and Derived Fields

Some resource field values are enumerated. These have derived fields naming the enumerated values.

Example:

Resource Field	Type	Size	Format/Comments

ProcessingLane	Integer	Byte	ProcessingLaneName
			{
			LaneA = 0,
			LaneB = 1
			}

ProcessingLaneName is a derived field that names the ProcessingLane and ProcessingLane is an enumerated field that can have value of 0 or 1.

When ProcessingLane value is 0, the ProcessingLaneName is “LaneA” and when ProcessingLane value is 1, the ProcessingLaneName is “LaneB”.

If the ProcessingLane has a value that is not specified in the definition of its derived field, the name will be “Unknown”.

Note: The derived fields are provided for readability and should not be used as part of a query.

4.1.2 Date/Time Format

The ODR date/time fields are based on three date/time formats: local with Utc offset, local, and Utc.

The name of the date/time field indicates the format.
For example:

- DateTimeStamp = local date/time with the Utc offset. (2014-08-30 16:00:05 -05:00)
- DateTimeStampLocal = local date/time. (2014-08-30 16:00:05)
- DateTimeStampUtc = Utc date/time. (2014-08-30 21:00:05)

The date/time shall have the following format: “YYYY-MM-DD HH:MM:SS”. The time shall be based on a 24-hour format.

Example: `“2013-03-05 16:24:51”`

Note: The date/time value returned may have the millisecond component.

Example: *`“2013-03-05 16:24:51.5228582”`*

4.1.3 Data Type Size

The following table describes the data types and their storage sizes:

Integral Types		
Int64	8 Bytes	Signed
Int32	4 Bytes	Signed
Int16	2 Bytes	Signed
Byte	1 Byte	Unsigned (0 - 255)
Boolean	1 Bit	
Floating Point Types		
Double	8 Bytes	Signed
Float	4 Bytes	Signed
Character Types		
String	As specified	

Note 1: Numeric data values that are outside of the specified range will be stored as NULL.

Note 2: String values that are longer than specified storage will be truncated.

4.2 Alinity-ci SCC Data Records

4.2.1 Calibration Curve Data

Resource name: CalCurve			
Field	**Type**	**Size**	**Format/Comments**
PrimaryKey	Integer	Int64	
DateTimeStamp	DateTime		
DateTimeStampLocal	DateTime		
DateTimeStampUtc	DateTime		
InstrumentId	Integer	Byte	

CalMethodType	Integer	Byte	CalMethodTypeName
			{
			Unknown = 0,
			PointToPoint = 1,
			LinearRegression = 2,
			Plc4Y = 3,
			Plc4X = 4,
			Plc4XTransform = 5,
			Qual2Point = 6,
			Qual1Point = 7,
			IaReference = 8,
			FivePlcX = 9,
			FivePlcY = 10,
			FivePlcXtransform = 11,
			FivePlc = 12,
			Abs = 13,
			Factor = 14,
			Linear = 15,
			Logit4 = 16,
			Logit5 = 17,
			Exponential = 18,
			Spline = 19,
			UseCalFactor = 20,
			UseCalFactorBlank = 21,
			Ict = 22
			}

CalCurveType	Integer	Byte	CalCurveTypeName
			{
			None = 0,
			Full = 1,
			Adjust = 2
			}

CalCurveStatus	Integer	Byte	CalCurveStatusName
			{
			Failed = 0,
			Expired = 1,
			NoCal = 2,
			PendingQc = 3,
			Overridden = 4,
			OverriddenLot = 5,
			InProcess = 6,
			Active = 7,
			Inactive = 8,
			BadVersion = 9,
			NotParticipatingType = 10,
			Expiring = 11
			}

CalibrationDate	DateTime		
CalibrationDateLocal	DateTime		
CalibrationDateUtc	DateTime		
CalibrationExpirationDate	DateTime		
CalibrationExpirationDateLocal	DateTime		
CalibrationExpirationDateUtc	DateTime		
AssayNumber	Integer	Int32	
AssayVersion	Integer	Int32	
AssayStatus	String	25	
AimCode	Integer	Int32	
AimSubCode	String	5	
ExceptionString	String	250	
ReagentMasterLotNumber	String	50	
CalLotNumber	String	420	
CalMasterLotId	Integer	Int32	
Cutoff	Real	Double	

Slope	Real	Double	4PLC assay type
Intercept	Real	Double	
P1	Real	Double	
P2	Real	Double	
P3	Real	Double	
P4	Real	Double	
P5	Real	Double	
NomConcentration	String	420	Cal Curve Fit Points (Curve_Parameters)
AvgAbsVoltage	String	420	Cal Curve Fit Points (Curve_Parameters)
CalFactor	String	420	Cal Curve Fit Points (Curve_Parameters)
AvgResponse	String	420	Cal Curve Fit Points (Curve_Parameters)
FitResponse	String	420	Cal Curve Fit Points (Curve_Parameters)
XfrmSlope	Real	Double	Linear_Xfrm_Slope
XfrmIntercept	Real	Double	Linear_Xfrm_Intercept
Ratio1	Real	Double	
Ratio2	Real	Double	
Rmse	Real	Double	
TestIds	String	420	

4.2.2 Calibration Result Completion Data

Resource name: **CalibrationResultCompletion**

Field	Type	Size	Format/Comment
PrimaryKey	Integer	Int64	
DateTimeStamp	DateTime		
DateTimeStampLocal	DateTime		
DateTimeStampUtc	DateTime		
InstrumentId	Integer	Byte	
TestId	Integer	Int32	
CalculatedAbsorbance	Real	Double	
Result	Real	Double	
ResultGuid	String	50	
ReportedResult	String	25	
ResultUnit	String	25	
RawResult	Real	Double	
DisplayedReportedResult	String	25	
InvariantReportedResult	String	25	

4.2.3 Constituent Data

Resource name: **ConstituentData**

Field	Type	Size	Format/Comment
PrimaryKey	Integer	Int64	
DateTimeStamp	DateTime		
DateTimeStampLocal	DateTime		
DateTimeStampUtc	DateTime		
InstrumentId	Integer	Byte	
ResultPrimaryKey	Integer	Int64	
TestId	Integer	Int32	
ConstituentTestId1	Integer	Int32	
ConstituentTestId2	Integer	Int32	
ConstituentTestId3	Integer	Int32	
ConstituentTestId4	Integer	Int32	
DerivedFormula	String	120	
ConstituentAssayNumber1	Integer	Int32	
ConstituentAssayNumber2	Integer	Int32	
ConstituentAssayNumber3	Integer	Int32	
ConstituentAssayNumber4	Integer	Int32	
ConstituentAssayName1	String	80	
ConstituentAssayName2	String	80	
ConstituentAssayName3	String	80	
ConstituentAssayName4	String	80	

ConstituentAssayPosition1	Integer	Byte	ConstituentAssayPosition1Name
			{
			Assay1,
			Assay2,
			Assay3,
			Assay4,
			Unknown
			}

ConstituentAssayPosition2	Integer	Byte	ConstituentAssayPosition2Name
			{
			Assay1,
			Assay2,
			Assay3,
			Assay4,
			Unknown
			}

ConstituentAssayPosition3	Integer	Byte	ConstituentAssayPosition3Name
			{
			Assay1,
			Assay2,
			Assay3,
			Assay4,
			Unknown
			}

ConstituentAssayPosition4	Integer	Byte	ConstituentAssayPosition4Name
			{
			Assay1,
			Assay2,
			Assay3,
			Assay4,
			Unknown
			}

ConstituentMaximum1	Real	Double	
ConstituentMaximum2	Real	Double	

ConstituentMaximum3	Real	Double	
ConstituentMaximum4	Real	Double	
ConstituentMinimum1	Real	Double	
ConstituentMinimum2	Real	Double	
ConstituentMinimum3	Real	Double	
ConstituentMinimum4	Real	Double	

4.2.4 Experiment Processing Data

Resource name: ExperimentProcessing			
Field	**Type**	**Size**	**Format/Comments**
PrimaryKey	Integer	Int64	
DateTimeStamp	DateTime		
DateTimeStampLocal	DateTime		
DateTimeStampUtc	DateTime		
InstrumentId	Integer	Byte	
ResultPrimaryKey	Integer	Int64	
ExpProcessingId	Integer	Int32	
ExpFileName	String	40	
IsSuccess	Integer	Byte	
UnloadReagents	Integer	Byte	
ExpDataManagementField1	String	60	
ExpDataManagementField2	String	60	
ExpDataManagementField3	String	60	
ExpDataManagementField4	String	60	
TestId	Integer	Int32	
LoadListDataManagementField1	String	60	
LoadListDataManagementField2	String	60	
LoadListDataManagementField3	String	60	
LoadListDataManagementField4	String	60	

4.2.5 Instrument Workcell Data

Resource name: **InstrumentWorkcell**			
Field	**Type**	**Size**	**Format/Comment**
InstrumentId	Integer	Byte	

ModuleId	Integer	Byte	ModuleIdName
			{
			SampleHandler = 0,
			Module1 = 1,
			Module2 = 2,
			Module3 = 3,
			Module4 = 4,
			Module5 = 5,
			Scc = 6,
			Unknown = -1 (Sent from InstServer as NotParticipating)
			}

ModuleType	Integer	Byte	ModuleTypeName
			{
			Unknown = 0,
			IaModuleType = 1,
			CcModuleType = 2,
			SampleHandlerType = 3,
			SccType = 4
			}
			
			Note that a value of -1 indicates no value was received from InstServer.

ModuleName	String	40	Can be found in the Module Type field on the Module Configuration screen in the UI for modules (IA, CC, RSM, etc…). For the SCC “module”, can be found in the System Name field on the General Settings screen in the UI.

PlatformType	Integer	Byte	PlatformTypeName
			{
			Unknown = 0,
			BSQ = 1,
			HSQ = 2,
			ICQ = 3,
			MQ = 4
			}
			
			Note that a value of -1 indicates no value was received from InstServer.

SystemSoftwareVersion	String	20	Comes from the system software component’s component version number in SystemVersionInfo.config. Did not see this in the UI.
ModuleSerialNumber	String	25	Comes from the module configuration screen in the UI for modules (IA, CC, RSM, etc…) Comes from system control center’s SCM serial number for SCC “module”. Found in General Settings screen in the UI.
ModuleSoftwareVersion	String	80	Comes from embedded software component for modules (IA, CC, RSM, etc…). Modules must be connected for this data to be collected. Comes from the InstServer software component’s component version number in BuildInfo.config for the SCC “module”.
ScmSerialNumber	String	40	Same as the module serial number when the module is Scc.
InstallDate	DateTime		
InstallDateLocal	DateTime		
InstallDateUtc	DateTime		
InUse	Integer	Byte	

4.2.6 Maintenance and Diagnostic History Data

Resource name: MNDHistory

Field	Type	Size	Format/Comment
PrimaryKey	Integer	Int64	
RecordId	Integer	Int64	
DateTimeStamp	DateTime		
DateTimeStampLocal	DateTime		
DateTimeStampUtc	DateTime		
InstrumentId	Integer	Byte	
OperatorId	String	20	

ProcedureType	Integer	Byte	ProcedureTypeName
			{
			Maintenance = 0,
			Diagnostic = 1
			}

ProcedureNumber	String	10	
ProcedureName	String	64	
ProcedureVersion	String	10	

ProcedureCategory	Integer	Byte	ProcedureCategoryName
			{
			RvLoader = 0,
			ReactionMechanisms = 1,
			FluidicsWash = 2,
			Modules = 3,
			Optics = 4,
			Temperature = 5,
			Pipettors = 6,
			ProcessPath = 7,
			SampleManager = 8,
			ReagentManager = 9,
			System = 10,
			Ict = 11,
			Utilities = 12,
			AsNeeded = 13,
			Daily = 14,
			Weekly = 15,
			Monthly = 16,
			Quarterly = 17,
			SemiAnnually = 18,
			Yearly = 19,
			All = 20,
			InProcess = 21,
			ToDo = 22
			}

LogDetail	String	7900	

ProcedureStatus	Integer	Byte	ProcedureStatusName
			{
			Install = 0,
			Delete = 1,
			Start = 2,
			Complete = 3,
			Comment = 4
			}

CompletionStatus	Integer	Byte	CompletionStatusName
			{
			Pass = 0,
			Fail = 1,
			Cancelled = 2
			}

4.2.7 Maintenance and Diagnostics Record Data

Resource name: MNDRecordData

Field	Type	Size	Format/Comment
PrimaryKey	Integer	Int64	
DateTimeStamp	DateTime		
DateTimeStampLocal	DateTime		
DateTimeStampUtc	DateTime		
InstrumentId	Integer	Byte	
MndHistoryPrimaryKey	Integer	Int64	
MndHistoryRecordId	Integer	Int64	Correlates to M&D History Data Record
DataName	String	100	
Data	String	7900	

4.2.8 Message History Data

Resource name: MessageHistory

Field	Type	Size	Format/Comment
PrimaryKey	Integer	Int64	
DateTimeStamp	DateTime		
DateTimeStampLocal	DateTime		
DateTimeStampUtc	DateTime		
InstrumentId	Integer	Byte	
ParentPrimaryKey	Integer	Int64	References another message history entry that this is related to. Used for linking related events.
AimCode	Integer	Int32	
AimSubCode	String	5	
ExceptionString	String	250	
OperatorId	String	20	

4.2.9 Result Data

Resource name: Result

Field	Type	Size	Format/Comment
PrimaryKey	Integer	Int64	
TestId	Integer	Int32	
DateTimeStamp	DateTime		
DateTimeStampLocal	DateTime		
DateTimeStampUtc	DateTime		
InstrumentId	Integer	Byte	
IsDerived	Integer	Byte	
AssayNumber	Integer	Int32	
AssayVersion	Integer	Int32	
AssayStatus	String	40	

AssayType	Integer	Byte	AssayTypeName
			{
			OneStep11
			OneStep25
			TwoStep4_4
			TwoStep18_4
			RateUp
			RateDown
			EndUp
			EndDown
			NaSerum
			NaUrine
			KSerum
			KUrine
			ClSerum
			ClUrine
			Lipemia
			Hemolysis
			Icterus
			Calculated
			NotParticipatingAssayType
			}

AssayName	String	80	
DilutionId	Integer	Int32	
SampleId	String	20	For patient result: Specimen ID For QC result: Control name For cal result: Calibrator ID
SampleSourceId	String	420	

SampleType	Integer		SampleTypeName
			{
			Unknown = 0,
			Specimen = 1,
			Calibrator = 2,
			Control = 3
			}

AliquotId	Integer	Int32	
TestOrderDate	DateTime		
TestOrderDateLocal	DateTime		
TestOrderDateUtc	DateTime		
TestInitiationDate	DateTime		
TestInitiationDateLocal	DateTime		
TestInitiationDateUtc	DateTime		
TestCompletionDate	DateTime		
TestCompletionDateLocal	DateTime		
TestCompletionDateUtc	DateTime		
ReagentMasterLotNumber	String	50	
ReagentSerialNumber	String	20	
ReagentExpirationDate	DateTime		
ReagentExpirationDateLocal	DateTime		
ReagentExpirationDateUtc	DateTime		
ReagentOnboardStability	Integer	Int32	
CalibrationDate	DateTime		
CalibrationDateLocal	DateTime		
CalibrationDateUtc	DateTime		
CalibrationLotNumber	String	50	
CalibrationExpirationDate	DateTime		

CalibrationExpirationDateLocal	DateTime		
CalibrationExpirationDateUtc	DateTime		
ControlMinRange	Real	Double	Available for control results, not for patient results.
ControlMaxRange	Real	Double	
IsAbbottControl	Integer	Byte	
ControlLotNumber	String	50	
ControlLevel	String	10	
ControlLotExpirationDate	DateTime		
ControlLotExpirationDateLocal	DateTime		
ControlLotExpirationDateUtc	DateTime		
ControlName	String	80	
OperatorId	String	20	Operator logged in when result was generated
AimCode	Integer	Int32	
AimSubcode	String	5	
ExceptionString	String	240	
RawResult	Real	Double	
ReportedResult	String	20	
ReportedResultUnit	String	20	
ResultFlags	String	200	
ResultInterpretation	String	20	
DilutionProtocol	String	20	Dilution protocol name

InterpretationType	Integer	Int32	InterpretationTypeName
			{
			NonReactive,
			GrayzoneNonReactive,
			GrayzoneReactive,
			Reactive,
			HighReactive,
			Unknown
			}

InterpretationCutoffType	Integer	Int32	InterpretationCutoffTypeName
			{
			None,
			Absolute,
			Derived,
			Unknown
			}

InterpretationCutoffValue	Real	Double	
InterpretationEditable	Integer	Int32	
InterpretationMinValue	Real	Double	
InterpretationMaxValue	Real	Double	
LoadListName	String	200	
ResultComment	String	240	
ResultCodes	String	20	
IntegratedDarkCount	Integer	Int32	
IntegratedSignalCount	Integer	Int32	
CorrectedCount	Integer	Int32	
DarkStdDeviation	Real	Double	

DarkAverage	Real	Double	
MaxDarkCountRead	Integer	Int32	
MinDarkCountRead	Integer	Int32	
DarkVariance	Real	Double	
SignalStdDeviation	Real	Double	
SignalAverage	Real	Double	
MaxForegroundRead	Integer	Int32	
MinForegroundRead	Integer	Int32	
SignalVariance	Real	Double	
DarkReadPeakInterval	Integer	Int32	
ForegroundPeakInterval	Integer	Int32	
SignalReads	String	420	
DarkSignalReads	String	420	
CuvetteNumber	Integer	Int32	CC
PrimaryWavelength	Integer	Int32	CC
SecondaryWavelength	Integer	Int32	CC
PrimaryWavelengthReads	String	420	Up to 38 reads CC
SecondaryWavelengthReads	String	420	Up to 38 reads CC
CalculatedAbsorbance	Real	Double	
Dac	Integer	Int32	
DACErrorcode	Integer	Int32	ICT
ErrorCodeData	String	40	
ICT Ref voltage Presample	Integer	Int32	ICT
ICT Ref voltage Post sample	Integer	Int32	ICT
IctVoltage	Real	Double	
Na Readings	Real	Double	ICT SampleDelta
K Readings	Real	Double	ICT
Cl Readings	Real	Double	ICT
CalcRefBeforeVoltage	Real	Double	Calculated voltage
CalcSampleVoltage	Real	Double	Calculated voltage
CalcReferenceAfterVoltage	Real	Double	Calculated voltage

4.2.10 Scripting Data

Resource name: **Scripting**

Field	Type	Size	Format/Comment
PrimaryKey	Integer	Int64	
DateTimeStamp	DateTime		
DateTimeStampLocal	DateTime		
DateTimeStampUtc	DateTime		
InstrumentId	Integer	Byte	
MndHistoryPrimaryKey	Integer	Int64	
MndHistoryRecordId	Integer	Int64	Correlates to M&D History Data Record
LogDetail	String	7900	Free form text description

4.3 Alinity-ci Instrument Data Records

4.3.1 AssayActivity Data

Resource name: AssayActivity			
Field	**Type**	**Size**	**Format/Comment**
PrimaryKey	Integer	Int64	
DateTimeStamp	DateTime		
DateTimeStampLocal	DateTime		
DateTimeStampUtc	DateTime		
InstrumentId	Integer	Byte	
ResultPrimaryKey	Integer	Int64	Primary key of related Result data record.
TestId	Integer	Int32	
StartLockstep	Integer	Int32	
StartLockstepOffset	Integer	Int32	
Duration	Integer	Int32	In miiliseconds

PathMechanism	Integer	Byte	PathMechanismName
			{
			Washzone1,
			Washzone2,
			Reagent1Itv1Mechanism,
			Reagent2Itv2Mechanism,
			PretreatItv3Mechanism,
			PretriggerItv4Mechanism,
			SampleDiverterMechanism,
			StatDiverterMechanism,
			WashzoneActivationDiverterMechanism,
			PretreatUnloadMechanism,
			PreTriggerMechanism,
			TriggerMechanism,
			OpticsMechanism,
			ProcessPathMechanism,
			SamplePipetterMechanism,
			Reagent1PipetterMechanism,
			Reagent2PipetterMechanism,
			ReagentCarouselMechanism,
			WashcupSample,
			WashcupR1,
			WashcupR2,
			RVLoaderMechanism,
			RVLoaderRVPretreatLoadMechanism,
			RVLoaderRVReactionLoadMechanism,
			RVLoaderRVPretreatStageMechanism,
			RVLoaderRVReactionStageMechanism,
			WasteAspirateMechanism,
			ReagentManagementMechanism,
			ProcessPathChannel1Mechanism,
			ProcessPathChannel2Mechanism,
			ProcessPathChannel3Mechanism,
			ProcessPathChannel4Mechanism,
			ProcessPathChannel5Mechanism,
			ProcessPathChannel6Mechanism,
			NoMechanism
			}

PathSubMechanism	Integer	Byte	PathSubMechanismName
			{
			NoPathSubMechanism,
			OpticsPreTriggerPump,
			OpticsTriggerPump,
			OpticsPmt,
			TrackShutter,
			OpticsCmiaRead,
			WashzoneDispPos1,
			WashzoneDispPos2,
			WashzoneDispPos3
			}

ActivityInformation	String	80	
ErrorCode	Integer	Int32	
ErrorMessage	String	250	ErrorCodefield as a string

ControllerLocation	Integer	Byte	ControllerLocationName
			{
			IA1,
			IA2,
			IA3,
			IA4,
			IA5,
			RSH
			}

4.3.2 CC Aspiration PM

Resource Name: CcAspirationPM			
Field	**Type**	**Size**	**Format/Comment**
PrimaryKey	Integer	Int64	
DateTimeStamp	DateTime		
DateTimeStampLocal	DateTime		
DateTimeStampUtc	DateTime		
InstrumentId	Integer	Byte	
ResultPrimaryKey	Integer	Int64	
SampleKey	Integer	Int32	
TestId	Integer	Int32	
StartingReplicateNumber	Integer	Int32	
ReplicateNumber	Integer	Int32	
AspirateStatus1	Integer	Int32	
AspirateStatus2	Integer	Int32	
AspirateStatus3	Integer	Int32	
AspirateStatus4	Integer	Int32	
AspirateStatus5	Integer	Int32	
PressureA1	Real	Double	
PressureA2	Real	Double	
PressureA3	Real	Double	
PressureA4	Real	Double	
PressureA5	Real	Double	
PressureA6	Real	Double	
PressureA7	Real	Double	
PressureA8	Real	Double	
TotalAveragePressure	Real	Double	
AverageFrontEndPressure	Real	Double	
AverageRelativeEndPressure	Real	Double	
AverageSyringeStopPressure	Real	Double	
WashReference	Real	Double	
SlopeScore15	Integer	Int32	
SlopeScore58	Integer	Int32	
LlsVoltageRange	Real	Double	
LlsSpareValue	Real	Double	
DtfFrequencyAmplitude12	Integer	Int32	
DtfFrequencyAmplitude34	Integer	Int32	
AspirateVolume	Real	Double	

ControllerIdentifier	Integer	Int16	ControllerIdentifierName
			{
			SampleHandler = 0,
			Module1 = 1,
			Module2 = 2,
			Module3 = 3,
			Module4 = 4,
			Module5 = 5,
			Scc = 6
			}

ToshibaTestNumber	Integer	Int32	
PipettorName	String	250	

4.3.3 CC Assay Activity

Resource Name: AssayActivityCc			
Field	**Type**	**Size**	**Format/Comment**
PrimaryKey	Integer	Int64	
DateTimeStamp	DateTime		
DateTimeStampLocal	DateTime		
DateTimeStampUtc	DateTime		
InstrumentId	Integer	Byte	
ResultPrimaryKey	Integer	Int64	
SampleKey	Integer	Int32	
TestId	Integer	Int32	
ActivityInformation	String	120	

ControllerIdentifier	Integer	Byte	ControllerIdentifierName
			{
			SampleHandler = 0,
			Module1 = 1,
			Module2 = 2,
			Module3 = 3,
			Module4 = 4,
			Module5 = 5,
			Scc = 6
			}

4.3.4 CC Bulk Solution Consumed Data

Resource Name: CcBulkSolutionConsumedData			
Field	**Type**	**Size**	**Format/Comment**
PrimaryKey	Integer	Int64	
DateTimeStamp	DateTime		
DateTimeStampLocal	DateTime		
DateTimeStampUtc	DateTime		
InstrumentId	Integer	Byte	
PumpStatus	Integer	Int32	The status of CABS pump (0:OFF,1:ON)

BottleType	Integer	Byte	BottleTypeName
			{
			BottleUnknown = 0,
			AlkalineWash = 1,
			AcidWash = 2,
			IctReference = 3
			}

AdcValue	Integer	Int32	The Adc value from sensor

ControllerIdentifier	Integer	Byte	ControllerIdentifierName
			{
			SampleHandler = 0,
			Module1 = 1,
			Module2 = 2,
			Module3 = 3,
			Module4 = 4,
			Module5 = 5,
			Scc = 6
			}

4.3.5 CC Bulk Solution Monitor Data

Resource Name: CcBulkSolutionMonitorData

Field	Type	Size	Format/Comment
PrimaryKey	Integer	Int64	
DateTimeStamp	DateTime		
DateTimeStampLocal	DateTime		
DateTimeStampUtc	DateTime		
InstrumentId	Integer	Byte	
ConsecutiveNumber	Integer	Int32	

BottleType	Integer	Byte	BottleTypeName
			{
			BottleUnknown = 0,
			AlkalineWash = 1,
			AcidWash = 2,
			IctReference = 3
			}

AdcValue	Integer	Int32	ADC value from the sensor

ControllerIdentifier	Integer	Byte	ControllerIdentifierName
			{
			SampleHandler = 0,
			Module1 = 1,
			Module2 = 2,
			Module3 = 3,
			Module4 = 4,
			Module5 = 5,
			Scc = 6
			}

4.3.6 CC Cuvette Wash Water Volume Data

Resource Name: CcCuvetteWashWaterVolumeData

Field	Type	Size	Format/Comment
PrimaryKey	Integer	Int64	
DateTimeStamp	DateTime		

DateTimeStampLocal	DateTime		
DateTimeStampUtc	DateTime		
InstrumentId	Integer	Byte	
DurationOfSupply	Integer	Int64	Duration of supply the cuvette washing water (msec)
WaterWash1Level	Integer	Int32	For water wash line 1
WaterWash2Level	Integer	Int32	For water wash line 2

ControllerIdentifier	Integer	Byte	ControllerIdentifierName
			{
			SampleHandler = 0,
			Module1 = 1,
			Module2 = 2,
			Module3 = 3,
			Module4 = 4,
			Module5 = 5,
			Scc = 6
			}

4.3.7 CC Dispense PM

Resource Name: CcDispensePM			
Field	**Type**	**Size**	**Format/Comment**
PrimaryKey	Integer	Int64	
DateTimeStamp	DateTime		
DateTimeStampLocal	DateTime		
DateTimeStampUtc	DateTime		
InstrumentId	Integer	Byte	
ResultPrimaryKey	Integer	Int64	
SampleKey	Integer	Int32	
TestId	Integer	Int32	
StartingReplicateNumber	Integer	Int32	
ReplicateNumber	Integer	Int32	
DispenseStatus1	Integer	Int32	
DispenseStatus2	Integer	Int32	
DispenseStatus3	Integer	Int32	
DispenseStatus4	Integer	Int32	
DispenseStatus5	Integer	Int32	
PressureD1	Real	Double	
PressureD2	Real	Double	
PressureD3	Real	Double	
PressureD4	Real	Double	
PressureD5	Real	Double	
PressureD6	Real	Double	

PressureD7	Real	Double	
PressureD8	Real	Double	
AverageDispenseSum	Real	Double	
AverageRelativeEndPressure	Real	Double	
SlopeScore15	Integer	Int32	
SlopeScore58	Integer	Int32	
DtfFrequencyAmplitude12	Integer	Int32	
DcOffset	Integer	Int32	
RampWash	Integer	Int32	
RampAsp	Integer	Int32	
Pulse	Integer	Int32	
RampFrequency	Integer	Int32	
PulseFrequency	Integer	Int32	
DispenseVolume	Real	Double	

ControllerIdentifier	Integer	Int16	ControllerIdentifierName
			{
			SampleHandler = 0,
			Module1 = 1,
			Module2 = 2,
			Module3 = 3,
			Module4 = 4,
			Module5 = 5,
			Scc = 6
			}

ToshibaTestNumber	Integer	Int32	
PipettorName	String	250	

4.3.8 CC Lamp Monitor Data

Resource Name: CcLampMonitorData

Field	Type	Size	Format/Comment
PrimaryKey	Integer	Int64	
DateTimeStamp	DateTime		
DateTimeStampLocal	DateTime		
DateTimeStampUtc	DateTime		
InstrumentId	Integer	Byte	
NumberOfData	Integer	Int32	Number of active data
CuvetteNumber	Integer	Int32	
Abs340380	Integer	Double	340nm-380nm Abs value (*10000)
WaveLength340BaseAdc	Integer	Int32	Value of 340nm base ADC
WaveLength340Adc	Integer	Int32	Value of 340nm ADC
WaveLength340Status	Integer	Int32	Value of 340nm ADC status
WaveLength340Abs	Integer	Double	Value of 340nm Abs (*10000)
WaveLength380BaseAdc	Integer	Int32	Value of 380nm base ADC
WaveLength380Adc	Integer	Int32	Value of 380nm ADC

WaveLength380Status	Integer	Int32	Value of 380nm ADC status
WaveLength380Abs	Integer	Double	Value of 380nm Abs (*10000)
LampMonitorErrorLevel	Integer	Int32	
LampMonitorErrorCuvetteNumber	Integer	Int32	
LampMonitorErrorAbs	Integer	Double	Abs Value (*10000)

ControllerIdentifier	Integer	Byte	ControllerIdentifierName
			{
			SampleHandler = 0,
			Module1 = 1,
			Module2 = 2,
			Module3 = 3,
			Module4 = 4,
			Module5 = 5,
			Scc = 6
			}

4.3.9 CC LLD

Resource Name: LLDCc			
Field	**Type**	**Size**	**Format/Comment**
PrimaryKey	Integer	Int64	
DateTimeStamp	DateTime		
DateTimeStampLocal	DateTime		
DateTimeStampUtc	DateTime		
InstrumentId	Integer	Byte	
ResultPrimaryKey	Integer	Int64	
SampleKey	Integer	Int32	
StartingReplicateNumber	Integer	Int32	
ReplicateNumber	Integer	Int32	
Volume	Integer	Int32	1. In the case of sample this represents volume of aspirate 2. In the case of reagents this represents the remaining pulse.
StepNumber	Integer	Int32	The step# at which fluid was found
StatusCode	Integer	Int32	
PipettingContext	String	10	
AssayNumber	Integer	Int32	
TestId	Integer	Int32	
ReagentAspirationPosition	Integer	Int32	
SourceModuleId	String	10	
SourceSubmoduleId	String	10	
DestinationModuleId	String	10	
DestinationSubmoduleId	String	10	

ControllerIdentifier	Integer	Byte	ControllerIdentifierName
			{
			SampleHandler = 0,
			Module1 = 1,
			Module2 = 2,
			Module3 = 3,
			Module4 = 4,
			Module5 = 5,
			Scc = 6
			}

4.3.10 CC Optics Adjust Trigger Sensor Data

Resource Name: CcOpticsAdjustTriggerSensorData			
Field	**Type**	**Size**	**Format/Comment**
PrimaryKey	Integer	Int64	
DateTimeStamp	DateTime		
DateTimeStampLocal	DateTime		
DateTimeStampUtc	DateTime		
InstrumentId	Integer	Byte	
ErrorFlag	Integer	Int32	Error Flag, 0:Normal, 900x:Error
ZeroPercentT	Integer	Int32	340nm 0%T
Gain	Integer	Int32	340nm gain value (0-3)
AdjustmentTime	Integer	Int32	Waiting counts of photometry starting (1count = 5us)
AdcValues	String		340nm ADC (ADC does not subtract 0%T)
FlagValues	String		0:Less than 2/3 value,10:Range of 2/3 value,11:Maximum value,12:Center value

ControllerIdentifier	Integer	Byte	ControllerIdentifierName
			{
			SampleHandler = 0,
			Module1 = 1,
			Module2 = 2,
			Module3 = 3,
			Module4 = 4,
			Module5 = 5,
			Scc = 6
			}

4.3.11 CC PhotoData

Resource Name: CcPhotoData			
Field	**Type**	**Size**	**Format/Comment**
PrimaryKey	Integer	Int64	
DateTimeStamp	DateTime		
DateTimeStampLocal	DateTime		
DateTimeStampUtc	DateTime		
InstrumentId	Integer	Byte	
ResultPrimaryKey	Integer	Int64	
SampleKey	Integer	Int32	
TestId	Integer	Int32	
StartingReplicateNumber	Integer	Int32	

ReplicateNumber	Integer	Int32	
CuvetteNumber	Integer	Int32	
ReadingNumber	Integer	Int32	
SystemCycleCount	Integer	Int32	
Data340	Integer	Int32	
Data380	Integer	Int32	
Data404	Integer	Int32	
Data416	Integer	Int32	
Data450	Integer	Int32	
Data476	Integer	Int32	
Data500	Integer	Int32	
Data524	Integer	Int32	
Data548	Integer	Int32	
Data572	Integer	Int32	
Data604	Integer	Int32	
Data628	Integer	Int32	
Data660	Integer	Int32	
Data700	Integer	Int32	
Data748	Integer	Int32	
Data804	Integer	Int32	
ErrorFlag	Integer	Int32	

ControllerIdentifier	Integer	Int16	ControllerIdentifierName
			{
			SampleHandler = 0,
			Module1 = 1,
			Module2 = 2,
			Module3 = 3,
			Module4 = 4,
			Module5 = 5,
			Scc = 6
			}

4.3.12 CC Pipettor PM Raw Data

Resource Name: CcPipettorPMRawData			
Field	**Type**	**Size**	**Format/Comment**
PrimaryKey	Integer	Int64	
DateTimeStamp	DateTime		
DateTimeStampLocal	DateTime		
DateTimeStampUtc	DateTime		
InstrumentId	Integer	Byte	
BoardId	Integer	Int32	
UniqueDataKey	Integer	Int64	
DataGenerationTimeStamp	DateTime		

PipettorType	Integer	Int32	PipettorTypeName
			{
			Unknown = -1,
			SamplePipettor = 0,
			R1Pipettor = 1,
			R2Pipettor = 2
			}

PipettorAction	Integer	Int32	PipettorActionName
			{
			Unknown = -1,
			Aspiration = 0,
			Dispense = 1,
			Wash = 2
			}

NumberOfSamples	Integer	Int32	
SampleRate	Integer	Int32	

DataUnit	Integer	Int32	DataUnitName
			{
			Unknown = -1,
			AdcCounts = 0,
			AdcFilteredCounts = 1,
			CurrentInMilliAmps = 2,
			VoltageInMilliVolts = 3,
			Percentage = 4,
			PowerInMilliWatts = 5,
			PowerInWatts = 6,
			FrequencyInHertz = 7,
			FrequencyInKiloHertz = 8
			}

PayloadData	String	7900	

ControllerIdentifier	Integer	Int16	ControllerIdentifierName
			{
			SampleHandler = 0,
			Module1 = 1,
			Module2 = 2,
			Module3 = 3,
			Module4 = 4,
			Module5 = 5,
			Scc = 6
			}

4.3.13 CC Reagent Aspiration Other Data

Resource Name: CcReagentAspirationOtherData			
Field	**Type**	**Size**	**Format/Comment**
PrimaryKey	Integer	Int64	
DateTimeStamp	DateTime		
DateTimeStampLocal	DateTime		
DateTimeStampUtc	DateTime		
InstrumentId	Integer	Byte	
ResultPrimaryKey	Integer	Int64	
BoardId	Integer	Int32	
UniqueDataKey	Integer	Int64	
DataGenerationTimestamp	DateTime		
DataGenerationTimestampLocal	DateTime		
DataGenerationTimestampUtc	DateTime		

DeviceType	Integer	Int32	DeviceTypeName
			{
			UnknownDeviceType = -1,
			Solenoid = 0,
			PMSensor =1,
			FlowSensor = 2,
			TempSensor = 3,
			VacSensor = 4,
			Heater = 5,
			Wam = 6,
			InductionHeater = 7
			}

DeviceId	Integer	Int32	

PipettorType	Integer	Int32	PipettorTypeName
			{
			UnknownDeviceType = -1,
			SamplePipettor = 0,
			R1Pipettor = 1,
			R2Pipettor = 2
			}

CommandId	Integer	Int64	
ResponseId	Integer	Int64	
TestId	Integer	Int64	
BufferName	Integer	Int32	
BufferNumber	Integer	Int32	
BufferStatus	Integer	Int32	
StartAdcIndex	Integer	Int32	
EndAdcIndex	Integer	Int32	
TxDataSize	Integer	Int32	
EchoByte	Integer	Int32	
StopTime	Integer	Int64	
StatusStart	Integer	Int64	
StatusDone	Integer	Int64	
Location	Integer	Int32	
Volume	Real	Double	
SumAspiration	Real	Double	
AverageFrontEndPressure	Real	Double	
FrontEndPressure	Integer	Int32	
BackEndPressure	Integer	Int32	

ControllerIdentifier	Integer	Int16	ControllerIdentifierName
			{
			SampleHandler = 0,
			Module1 = 1,
			Module2 = 2,
			Module3 = 3,
			Module4 = 4,
			Module5 = 5,
			Scc = 6
			}

4.3.14 CC Reagent Aspiration Pci Data

Resource Name: CcReagentAspirationPciData			
Field	**Type**	**Size**	**Format/Comment**
PrimaryKey	Integer	Int64	

DateTimeStamp	DateTime		
DateTimeStampLocal	DateTime		
DateTimeStampUtc	DateTime		
InstrumentId	Integer	Byte	
ResultPrimaryKey	Integer	Int64	
BoardId	Integer	Int32	
UniqueDataKey	Integer	Int64	
DataGenerationTimestamp	DateTime		
DataGenerationTimestampLocal	DateTime		
DataGenerationTimestampUtc	DateTime		

DeviceType	Integer	Int32	DeviceTypeName
			{
			UnknownDeviceType = -1,
			Solenoid = 0,
			PMSensor =1,
			FlowSensor = 2,
			TempSensor = 3,
			VacSensor = 4,
			Heater = 5,
			Wam = 6,
			InductionHeater = 7
			}

DeviceId	Integer	Int32	

PipettorType	Integer	Int32	PipettorTypeName
			{
			UnknownDeviceType = -1,
			SamplePipettor = 0,
			R1Pipettor = 1,
			R2Pipettor = 2
			}

CommandId	Integer	Int64	
ResponseId	Integer	Int64	
TestId	Integer	Int64	
ResultSensorCrash	Integer	Int32	
ResultCode	Integer	Int32	
ResultCode2	Integer	Int32	
PressureA1	Integer	Int32	
PressureA2	Integer	Int32	
PressureA3	Integer	Int32	
PressureA4	Integer	Int32	
PressureA5	Integer	Int32	
PressureA6	Integer	Int32	
PressureA7	Integer	Int32	
PressureA8	Integer	Int32	
TotalAveragePressure	Integer	Int32	
AverageFrontEndPressure	Integer	Int32	
AverageRelativeEndPressure	Integer	Int32	
LiquidDetectedAdcIndex	Integer	Int32	
WashReference	Integer	Int32	
PhmUniqueKey	Integer	Int64	

Spare1	Integer	Int64	
LlsMaxVolts	Integer	Int32	
LlsMinVolts	Integer	Int32	
Spare2	Integer	Int64	
Duration	Integer	Int32	
SampleSize	Integer	Int32	
SampleKey	Integer	Int64	
TestNumber	Integer	Int32	
ReplicateStart	Integer	Int32	
ReplicateNumber	Integer	Int32	

ControllerIdentifier	Integer	Int16	ControllerIdentifierName
			{
			SampleHandler = 0,
			Module1 = 1,
			Module2 = 2,
			Module3 = 3,
			Module4 = 4,
			Module5 = 5,
			Scc = 6
			}

4.3.15 CC Reagent Carousel Cooler Temperature Data

Resource Name: CcReagentCarouselCoolerTemperatureData

Field	Type	Size	Format/Comment
PrimaryKey	Integer	Int64	
DateTimeStamp	DateTime		
DateTimeStampLocal	DateTime		
DateTimeStampUtc	DateTime		
InstrumentId	Integer	Byte	

TemperatureType	Integer	Byte	TemperatureTypeName
			{
			RealTime = 0,
			Average = 1
			}

Temperature	String	10	

ControllerIdentifier	Integer	Byte	ControllerIdentifierName
			{
			SampleHandler = 0,
			Module1 = 1,
			Module2 = 2,
			Module3 = 3,
			Module4 = 4,
			Module5 = 5,
			Scc = 6
			}

4.3.16 CC Reagent Carousel Teknic Motor Data

Resource Name: CcReagentCarouselTeknicMotorData

Field	Type	Size	Format/Comment
PrimaryKey	Integer	Int64	
DateTimeStamp	DateTime		

DateTimeStampLocal	DateTime		
DateTimeStampUtc	DateTime		
InstrumentId	Integer	Byte	
PhmData	String	5000	

ControllerIdentifier	Integer	Byte	ControllerIdentifierName
			{
			SampleHandler = 0,
			Module1 = 1,
			Module2 = 2,
			Module3 = 3,
			Module4 = 4,
			Module5 = 5,
			Scc = 6
			}

4.3.17 CC Reagent Dispense Other Data

Resource Name: CcReagentDispenseOtherData

Field	Type	Size	Format/Comment
PrimaryKey	Integer	Int64	
DateTimeStamp	DateTime		
DateTimeStampLocal	DateTime		
DateTimeStampUtc	DateTime		
InstrumentId	Integer	Byte	
ResultPrimaryKey	Integer	Int64	
BoardId	Integer	Int32	
UniqueDataKey	Integer	Int64	
DataGenerationTimestamp	DateTime		
DataGenerationTimestampLocal	DateTime		
DataGenerationTimestampUtc	DateTime		

DeviceType	Integer	Int32	DeviceTypeName
			{
			UnknownDeviceType = -1,
			Solenoid = 0,
			PMSensor =1,
			FlowSensor = 2,
			TempSensor = 3,
			VacSensor = 4,
			Heater = 5,
			Wam = 6,
			InductionHeater = 7
			}

DeviceId	Integer	Int32	

PipettorType	Integer	Int32	PipettorTypeName
			{
			UnknownDeviceType = -1,
			SamplePipettor = 0,
			R1Pipettor = 1,
			R2Pipettor = 2
			}

CommandId	Integer	Int64	
ResponseId	Integer	Int64	
TestId	Integer	Int64	
BufferName	Integer	Int32	
BufferNumber	Integer	Int32	

BufferStatus	Integer	Int32	
StartAdcIndex	Integer	Int32	
EndAdcIndex	Integer	Int32	
TxDataSize	Integer	Int32	
EchoByte	Integer	Int32	
StopTime	Integer	Int64	
StatusStart	Integer	Int64	
StatusDone	Integer	Int64	
Volume	Real	Double	

ControllerIdentifier	Integer	Int16	ControllerIdentifierName
			{
			SampleHandler = 0,
			Module1 = 1,
			Module2 = 2,
			Module3 = 3,
			Module4 = 4,
			Module5 = 5,
			Scc = 6
			}

4.3.18 CC Reagent Dispense Pci Data

Resource Name: CcReagentDispensePciData

Field	Type	Size	Format/Comment
PrimaryKey	Integer	Int64	
DateTimeStamp	DateTime		
DateTimeStampLocal	DateTime		
DateTimeStampUtc	DateTime		
InstrumentId	Integer	Byte	
ResultPrimaryKey	Integer	Int64	
BoardId	Integer	Int32	
UniqueDataKey	Integer	Int64	
DataGenerationTimestamp	DateTime		
DataGenerationTimestampLocal	DateTime		
DataGenerationTimestampUtc	DateTime		

DeviceType	Integer	Int32	DeviceTypeName
			{
			UnknownDeviceType = -1,
			Solenoid = 0,
			PMSensor =1,
			FlowSensor = 2,
			TempSensor = 3,
			VacSensor = 4,
			Heater = 5,
			Wam = 6,
			InductionHeater = 7
			}

DeviceId	Integer	Int32	

PipettorType	Integer	Int32	PipettorTypeName
			{
			UnknownDeviceType = -1,
			SamplePipettor = 0,
			R1Pipettor = 1,
			R2Pipettor = 2
			}

CommandId	Integer	Int64	
ResponseId	Integer	Int64	
TestId	Integer	Int64	
ResultSensorCrash	Integer	Int32	
ResultCode	Integer	Int32	
Spare1	Integer	Int32	
PressureD1	Integer	Int32	
PressureD2	Integer	Int32	
PressureD3	Integer	Int32	
PressureD4	Integer	Int32	
PressureD5	Integer	Int32	
PressureD6	Integer	Int32	
PressureD7	Integer	Int32	
PressureD8	Integer	Int32	
PressureD9	Integer	Int32	
PressureD10	Integer	Int32	
Type	Integer	Int32	
LiquidDetectedIndex	Integer	Int32	
Spare2	Integer	Int64	
DcOffset	Integer	Int32	
PhmUniqueKey	Integer	Int64	
PeakD4D5Delta	Integer	Int32	
PeakD6D5Delta	Integer	Int32	
Duration	Integer	Int32	
SampleSize	Integer	Int32	
SampleKey	Integer	Int64	
TestNumber	Integer	Int32	
ReplicateStart	Integer	Int32	
ReplicateNumber	Integer	Int32	

ControllerIdentifier	Integer	Int16	ControllerIdentifierName
			{
			SampleHandler = 0,
			Module1 = 1,
			Module2 = 2,
			Module3 = 3,
			Module4 = 4,
			Module5 = 5,
			Scc = 6
			}

4.3.19 CC Reagent Wash Other Data

Resource Name: CcReagentWashOtherData			
Field	**Type**	**Size**	**Format/Comment**
PrimaryKey	Integer	Int64	
DateTimeStamp	DateTime		
DateTimeStampLocal	DateTime		

DateTimeStampUtc	DateTime		
InstrumentId	Integer	Byte	
ResultPrimaryKey	Integer	Int64	
BoardId	Integer	Int32	
UniqueDataKey	Integer	Int64	
DataGenerationTimestamp	DateTime		
DataGenerationTimestampLocal	DateTime		
DataGenerationTimestampUtc	DateTime		

DeviceType	Integer	Int32	DeviceTypeName
			{
			UnknownDeviceType = -1,
			Solenoid = 0,
			PMSensor =1,
			FlowSensor = 2,
			TempSensor = 3,
			VacSensor = 4,
			Heater = 5,
			Wam = 6,
			InductionHeater = 7
			}

DeviceId	Integer	Int32	

PipettorType	Integer	Int32	PipettorTypeName
			{
			UnknownDeviceType = -1,
			SamplePipettor = 0,
			R1Pipettor = 1,
			R2Pipettor = 2
			}

CommandId	Integer	Int64	
ResponseId	Integer	Int64	
TestId	Integer	Int64	
BufferName	Integer	Int32	
BufferNumber	Integer	Int32	
BufferStatus	Integer	Int32	
StartAdcIndex	Integer	Int32	
EndAdcIndex	Integer	Int32	
TxDataSize	Integer	Int32	
EchoByte	Integer	Int32	
StopTime	Integer	Int64	
StatusStart	Integer	Int64	
StatusDone	Integer	Int64	
BeginningWashValue	Real	Double	
LvWashSum	Real	Double	
WashSum	Integer	Int32	
WashSteadyStateSum	Integer	Int32	

ControllerIdentifier	Integer	Int16	ControllerIdentifierName
			{
			SampleHandler = 0,
			Module1 = 1,
			Module2 = 2,
			Module3 = 3,
			Module4 = 4,
			Module5 = 5,
			Scc = 6
			}

4.3.20 CC Reagent Wash Pci Data

Resource Name: CcReagentWashPciData			
Field	**Type**	**Size**	**Format/Comment**
PrimaryKey	Integer	Int64	
DateTimeStamp	DateTime		
DateTimeStampLocal	DateTime		
DateTimeStampUtc	DateTime		
InstrumentId	Integer	Byte	
ResultPrimaryKey	Integer	Int64	
BoardId	Integer	Int32	
UniqueDataKey	Integer	Int64	
DataGenerationTimestamp	DateTime		
DataGenerationTimestampLocal	DateTime		
DataGenerationTimestampUtc	DateTime		

DeviceType	Integer	Int32	DeviceTypeName
			{
			UnknownDeviceType = -1,
			Solenoid = 0,
			PMSensor =1,
			FlowSensor = 2,
			TempSensor = 3,
			VacSensor = 4,
			Heater = 5,
			Wam = 6,
			InductionHeater = 7
			}

DeviceId	Integer	Int32	

PipettorType	Integer	Int32	PipettorTypeName
			{
			UnknownDeviceType = -1,
			SamplePipettor = 0,
			R1Pipettor = 1,
			R2Pipettor = 2
			}

CommandId	Integer	Int64	
ResponseId	Integer	Int64	
TestId	Integer	Int64	
ResultSensorCrash	Integer	Int32	
ResultCode	Integer	Int32	
ResultCode2	Integer	Int32	
PhmUniqueKey	Integer	Int64	
Spare1	Integer	Int32	
AverageWashSum1	Integer	Int32	

AverageWashSum2	Integer	Int32	
AverageWashSteadyStateSum1	Integer	Int32	
AverageWashSteadyStateSum2	Integer	Int32	
WashSumSd	Integer	Int32	
WashData1	Integer	Int32	
Duration1	Integer	Int64	
Duration2	Integer	Int64	
SampleKey	Integer	Int64	
TestNumber	Integer	Int32	
ReplicateStart	Integer	Int32	
ReplicateNumber	Integer	Int32	

ControllerIdentifier	Integer	Int16	ControllerIdentifierName
			{
			SampleHandler = 0,
			Module1 = 1,
			Module2 = 2,
			Module3 = 3,
			Module4 = 4,
			Module5 = 5,
			Scc = 6
			}

4.3.21 CC Sample Aspiration Other Data

Resource Name: CcSampleAspirationOtherData

Field	Type	Size	Format/Comment
PrimaryKey	Integer	Int64	
DateTimeStamp	DateTime		
DateTimeStampLocal	DateTime		
DateTimeStampUtc	DateTime		
InstrumentId	Integer	Byte	
ResultPrimaryKey	Integer	Int64	
BoardId	Integer	Int32	
UniqueDataKey	Integer	Int64	
DataGenerationTimestamp	DateTime		
DataGenerationTimestampLocal	DateTime		
DataGenerationTimestampUtc	DateTime		

DeviceType	Integer	Int32	DeviceTypeName
			{
			UnknownDeviceType = -1,
			Solenoid = 0,
			PMSensor =1,
			FlowSensor = 2,
			TempSensor = 3,
			VacSensor = 4,
			Heater = 5,
			Wam = 6,
			InductionHeater = 7
			}

DeviceId	Integer	Int32	
CommandId	Integer	Int64	
ResponseId	Integer	Int64	

TestId	Integer	Int64	
BufferName	Integer	Int32	
BufferNumber	Integer	Int32	
BufferStatus	Integer	Int32	
StartAdcIndex	Integer	Int32	
EndAdcIndex	Integer	Int32	
TxDataSize	Integer	Int32	
EchoByte	Integer	Int32	
StopTime	Integer	Int64	
StatusStart	Integer	Int64	
StatusDone	Integer	Int64	
TsgRampWash	Integer	Int32	
DcOffset	Integer	Int32	
AspirationLocation	Integer	Int32	
AspirationCount	Integer	Int32	
AspirationVolume	Real	Double	
AspirationPressureSum	Real	Double	
AverageFrontEndPressure	Real	Double	
AverageBackEndPressure	Real	Double	
RelativeAspirationEndPressure	Real	Double	
ClotOverPressure	Real	Double	
WashEndPressure	Real	Double	
FrontVolts	Real	Double	
EndVolts	Real	Double	
FrontEndPressure	Integer	Int32	
BackEndPressure	Integer	Int32	
AspirationSum	Integer	Int32	
AspirationOverClotPressure	Integer	Int32	
LlsFrontVolts	Integer	Int32	
LlsEndVolts	Integer	Int32	

ControllerIdentifier	Integer	Int16	ControllerIdentifierName
			`{`
			`SampleHandler = 0,`
			`Module1 = 1,`
			`Module2 = 2,`
			`Module3 = 3,`
			`Module4 = 4,`
			`Module5 = 5,`
			`Scc = 6`
			`}`

4.3.22 CC Sample Aspiration Pci Data

Resource Name: CcSampleAspirationPciData			
Field	**Type**	**Size**	**Format/Comment**
PrimaryKey	Integer	Int64	
DateTimeStamp	DateTime		

DateTimeStampLocal	DateTime		
DateTimeStampUtc	DateTime		
InstrumentId	Integer	Byte	
ResultPrimaryKey	Integer	Int64	
BoardId	Integer	Int32	
UniqueDataKey	Integer	Int64	
DataGenerationTimestamp	DateTime		
DataGenerationTimestampLocal	DateTime		
DataGenerationTimestampUtc	DateTime		

DeviceType	Integer	Int32	DeviceTypeName
			{
			UnknownDeviceType = -1,
			Solenoid = 0,
			PMSensor =1,
			FlowSensor = 2,
			TempSensor = 3,
			VacSensor = 4,
			Heater = 5,
			Wam = 6,
			InductionHeater = 7
			}

DeviceId	Integer	Int32	
CommandId	Integer	Int64	
ResponseId	Integer	Int64	
TestId	Integer	Int64	
ResultSensorCrash	Integer	Int32	
ResultCode	Integer	Int32	
ResultCode2	Integer	Int32	
PressureA1	Integer	Int32	
PressureA2	Integer	Int32	
PressureA3	Integer	Int32	
PressureA4	Integer	Int32	
PressureA5	Integer	Int32	
PressureA6	Integer	Int32	
PressureA7	Integer	Int32	
PressureA8	Integer	Int32	
TotalAveragePressure	Integer	Int32	
AverageFrontEndPressure	Integer	Int32	
AverageRelativeEndPressure	Integer	Int32	
LiquidDetectedIndex	Integer	Int32	
WashReference	Integer	Int32	
LiquidDetectedThetaIndex	Integer	Int64	
PhmUniqueKey	Integer	Int64	
LlsMaxVolts	Integer	Int32	
LlsMinVolts	Integer	Int32	
Spare1	Integer	Int64	
Duration	Integer	Int32	
SampleSize	Integer	Int32	

SampleKey	Integer	Int64	
TestNumber	Integer	Int32	
ReplicateStart	Integer	Int32	
ReplicateNumber	Integer	Int32	

ControllerIdentifier	Integer	Int16	ControllerIdentifierName
			{
			SampleHandler = 0,
			Module1 = 1,
			Module2 = 2,
			Module3 = 3,
			Module4 = 4,
			Module5 = 5,
			Scc = 6
			}

4.3.23 CC Sample Dispense Other Data

Resource Name: CcSampleDispenseOtherData

Field	Type	Size	Format/Comment
PrimaryKey	Integer	Int64	
DateTimeStamp	DateTime		
DateTimeStampLocal	DateTime		
DateTimeStampUtc	DateTime		
InstrumentId	Integer	Byte	
ResultPrimaryKey	Integer	Int64	
BoardId	Integer	Int32	
UniqueDataKey	Integer	Int64	
DataGenerationTimestamp	DateTime		
DataGenerationTimestampLocal	DateTime		
DataGenerationTimestampUtc	DateTime		

DeviceType	Integer	Int32	DeviceTypeName
			{
			UnknownDeviceType = -1,
			Solenoid = 0,
			PMSensor =1,
			FlowSensor = 2,
			TempSensor = 3,
			VacSensor = 4,
			Heater = 5,
			Wam = 6,
			InductionHeater = 7
			}

DeviceId	Integer	Int32	
CommandId	Integer	Int64	
ResponseId	Integer	Int64	
TestId	Integer	Int64	
BufferName	Integer	Int32	
BufferNumber	Integer	Int32	
BufferStatus	Integer	Int32	
StartAdcIndex	Integer	Int32	
EndAdcIndex	Integer	Int32	
TxDataSize	Integer	Int32	

EchoByte	Integer	Int32	
StopTime	Integer	Int64	
StatusStart	Integer	Int64	
StatusDone	Integer	Int64	
TsgRampWash	Integer	Int32	
DispenseOverPressure1	Integer	Int32	
DispenseOverPressure2	Integer	Int32	
DispenseOverPressure3	Integer	Int32	
DispenseOverPressure4	Integer	Int32	
DispenseOverPressure5	Integer	Int32	
OverPressureDispense1	Integer	Int32	
OverPressureDispense2	Integer	Int32	
OverPressureDispense3	Integer	Int32	
OverPressureDispense4	Integer	Int32	
OverPressureDispense5	Integer	Int32	
DispenseCount	Integer	Int32	
ErrorCode	Integer	Int32	
DispenseVolume	Real	Double	
SumDispense	Real	Double	
DispenseFrontPressure	Integer	Int32	
DispenseEndPressure	Integer	Int32	
DispenseSum	Integer	Int32	
DispenseReadyAverage	Integer	Int32	
DispenseBeginAverage	Integer	Int32	
Dispense60Average	Integer	Int32	
DispenseEndAverage	Integer	Int32	

ControllerIdentifier	Integer	Int16	ControllerIdentifierName
			{
			SampleHandler = 0,
			Module1 = 1,
			Module2 = 2,
			Module3 = 3,
			Module4 = 4,
			Module5 = 5,
			Scc = 6
			}

4.3.24 CC Sample Dispense Pci Data

Resource Name: CcSampleDispensePciData			
Field	**Type**	**Size**	**Format/Comment**
PrimaryKey	Integer	Int64	
DateTimeStamp	DateTime		
DateTimeStampLocal	DateTime		
DateTimeStampUtc	DateTime		
InstrumentId	Integer	Byte	
ResultPrimaryKey	Integer	Int64	

BoardId	Integer	Int32	
UniqueDataKey	Integer	Int64	
DataGenerationTimestamp	DateTime		
DataGenerationTimestampLocal	DateTime		
DataGenerationTimestampUtc	DateTime		

DeviceType	Integer	Int32	DeviceTypeName
			{
			UnknownDeviceType = -1,
			Solenoid = 0,
			PMSensor =1,
			FlowSensor = 2,
			TempSensor = 3,
			VacSensor = 4,
			Heater = 5,
			Wam = 6,
			InductionHeater = 7
			}

DeviceId	Integer	Int32	
CommandId	Integer	Int64	
ResponseId	Integer	Int64	
TestId	Integer	Int64	
ResultSensorCrash	Integer	Int32	
ResultCode	Integer	Int32	
ResultCode2	Integer	Int32	
PressureA1	Integer	Int32	
PressureA2	Integer	Int32	
PressureA3	Integer	Int32	
PressureA4	Integer	Int32	
PressureA5	Integer	Int32	
PressureA6	Integer	Int32	
PressureA7	Integer	Int32	
PressureA8	Integer	Int32	
AverageDispenseSum	Integer	Int32	
AverageRelativeEndPressure	Integer	Int32	
PhmUniqueKey	Integer	Int64	
Spare1	Integer	Int64	
Spare2	Integer	Int64	
DcOffset	Integer	Int32	
DispenseReadyAverage	Integer	Int32	
DispenseBeginAverage	Integer	Int32	
Dispense60Average	Integer	Int32	
DispenseEndAverage	Integer	Int32	
Duration	Integer	Int32	
SampleSize	Integer	Int32	
SampleKey	Integer	Int64	
TestNumber	Integer	Int32	
ReplicateStart	Integer	Int32	
ReplicateNumber	Integer	Int32	

ControllerIdentifier	Integer	Int16	ControllerIdentifierName
			{
			SampleHandler = 0,
			Module1 = 1,
			Module2 = 2,
			Module3 = 3,
			Module4 = 4,
			Module5 = 5,
			Scc = 6
			}

4.3.25 CC Sample Wash Other Data

Resource Name: CcSampleWashOtherData			
Field	**Type**	**Size**	**Format/Comment**
PrimaryKey	Integer	Int64	
DateTimeStamp	DateTime		
DateTimeStampLocal	DateTime		
DateTimeStampUtc	DateTime		
InstrumentId	Integer	Byte	
ResultPrimaryKey	Integer	Int64	
BoardId	Integer	Int32	
UniqueDataKey	Integer	Int64	
DataGenerationTimestamp	DateTime		
DataGenerationTimestampLocal	DateTime		
DataGenerationTimestampUtc	DateTime		

DeviceType	Integer	Int32	DeviceTypeName
			{
			UnknownDeviceType = -1,
			Solenoid = 0,
			PMSensor =1,
			FlowSensor = 2,
			TempSensor = 3,
			VacSensor = 4,
			Heater = 5,
			Wam = 6,
			InductionHeater = 7
			}

DeviceId	Integer	Int32	
CommandId	Integer	Int64	
ResponseId	Integer	Int64	
TestId	Integer	Int64	
BufferName	Integer	Int32	
BufferNumber	Integer	Int32	
BufferStatus	Integer	Int32	
StartAdcIndex	Integer	Int32	
EndAdcIndex	Integer	Int32	
TxDataSize	Integer	Int32	
EchoByte	Integer	Int32	
StopTime	Integer	Int64	
StatusStart	Integer	Int64	
StatusDone	Integer	Int64	

TsgRampWash	Integer	Int32	
DcOffset	Integer	Int32	
ErrorCode	Integer	Int32	
WashCount	Integer	Int32	
WashPositivePeak1	Real	Double	
WashPositivePeak2	Real	Double	
WashNegativePeak1	Real	Double	
WashNegativePeak2	Real	Double	
LvPreWashValue	Real	Double	
BeginningWashValue	Real	Double	
LvWashSum	Real	Double	
PreWashValue	Integer	Int32	
WashSum	Integer	Int32	
WashSteadyStateSum	Integer	Int32	

ControllerIdentifier	Integer	Int16	ControllerIdentifierName
			{
			SampleHandler = 0,
			Module1 = 1,
			Module2 = 2,
			Module3 = 3,
			Module4 = 4,
			Module5 = 5,
			Scc = 6
			}

4.3.26 CC Sample Wash Pci Data

Resource Name: CcSampleWashPciData

Field	Type	Size	Format/Comment
PrimaryKey	Integer	Int64	
DateTimeStamp	DateTime		
DateTimeStampLocal	DateTime		
DateTimeStampUtc	DateTime		
InstrumentId	Integer	Byte	
ResultPrimaryKey	Integer	Int64	
BoardId	Integer	Int32	
UniqueDataKey	Integer	Int64	
DataGenerationTimestamp	DateTime		
DataGenerationTimestampLocal	DateTime		
DataGenerationTimestampUtc	DateTime		

DeviceType	Integer	Int32	DeviceTypeName
			{
			UnknownDeviceType = -1,
			Solenoid = 0,
			PMSensor =1,
			FlowSensor = 2,
			TempSensor = 3,
			VacSensor = 4,
			Heater = 5,
			Wam = 6,
			InductionHeater = 7
			}

DeviceId	Integer	Int32	
CommandId	Integer	Int64	
ResponseId	Integer	Int64	
TestId	Integer	Int64	
ResultSensorCrash	Integer	Int32	
ResultCode	Integer	Int32	
ResultCode2	Integer	Int32	
AveragePreWashValue	Integer	Int32	
WashPositivePeak1	Integer	Int32	
WashPositivePeak2	Integer	Int32	
WashNegativePeak1	Integer	Int32	
WashNegativePeak2	Integer	Int32	
AverageWashSum	Integer	Int32	
AverageWashSteadyStateSum	Integer	Int32	
WashSumSd	Integer	Int32	
PhmUniqueKey	Integer	Int64	
WashData2	Integer	Int32	
Duration	Integer	Int64	
SampleKey	Integer	Int64	
TestNumber	Integer	Int32	
ReplicateStart	Integer	Int32	
ReplicateNumber	Integer	Int32	

ControllerIdentifier	Integer	Int16	ControllerIdentifierName
			{
			SampleHandler = 0,
			Module1 = 1,
			Module2 = 2,
			Module3 = 3,
			Module4 = 4,
			Module5 = 5,
			Scc = 6
			}

4.3.27 CC Wash PM

Resource Name: CcWashPM			
Field	**Type**	**Size**	**Format/Comment**
PrimaryKey	Integer	Int64	
DateTimeStamp	DateTime		
DateTimeStampLocal	DateTime		
DateTimeStampUtc	DateTime		
InstrumentId	Integer	Byte	
ResultPrimaryKey	Integer	Int64	
SampleKey	Integer	Int32	
TestId	Integer	Int32	
StartingReplicateNumber	Integer	Int32	
ReplicateNumber	Integer	Int32	

WashStatus1	Integer	Int32	
WashStatus2	Integer	Int32	
WashStatus3	Integer	Int32	
WashStatus4	Integer	Int32	
WashStatus5	Integer	Int32	
PreWashPressure	Real	Double	
WashPositivePeakPressure1	Real	Double	
WashPositivePeakPressure2	Real	Double	
WashNegativePeakPressure1	Real	Double	
WashNegativePeakPressure2	Real	Double	
BeginWashPressure	Real	Double	
SteadyStateWashPressure	Real	Double	
SteadyStateStandardDeviation	Integer	Int32	
SupplementalWashData1	Integer	Int32	
SupplementalWashData2	Integer	Int32	
SupplementalWashData3	Integer	Int32	

ControllerIdentifier	Integer	Int16	ControllerIdentifierName
			{
			SampleHandler = 0,
			Module1 = 1,
			Module2 = 2,
			Module3 = 3,
			Module4 = 4,
			Module5 = 5,
			Scc = 6
			}

ToshibaTestNumber	Integer	Int32	
PipettorName	String	250	

4.3.28 CC WaterBath Refill Data

Resource name: CcWaterBathRefillData

Field	Type	Size	Format/Comment
PrimaryKey	Integer	Int64	
DateTimeStamp	DateTime		
DateTimeStampLocal	DateTime		
DateTimeStampUtc	DateTime		
InstrumentId	Integer	Byte	
Status	Integer	Int32	The Status (0:FALSE or 1:TRUE)
ElapsedTime	Integer	Int32	

ControllerIdentifier	Integer	Byte	ControllerIdentifierName
			{
			SampleHandler = 0,
			Module1 = 1,
			Module2 = 2,
			Module3 = 3,
			Module4 = 4,
			Module5 = 5,
			Scc = 6
			}

4.3.29 Event Data

Resource name: InstrumentEvent			
Field	**Type**	**Size**	**Format/Comment**
PrimaryKey	Integer	Int64	
DateTimeStamp	DateTime		
DateTimeStampLocal	DateTime		
DateTimeStampUtc	DateTime		
InstrumentId	Integer	Byte	

EventLevel	Integer	Byte	EventLevelName
			{
			Critical = 6,
			Error = 5,
			Warning = 4,
			Info = 3,
			Debug = 2,
			Minor = 1
			}

ProcessNumber	Integer	Int32	
ProcessName	String	30	
Component	String	30	Software module, class etc.
Lockstep	Integer	Int32	
ErrorCode	Integer	Int32	
Description	String	256	

ControllerLocation	Integer	Byte	ControllerLocationName
			{
			IA1,
			IA2,
			IA3,
			IA4,
			IA5,
			RSH
			}

4.3.30 Heater Duty Cycle Data

Resource Name: HeaterDutyCycleData			
Field	**Type**	**Size**	**Format/Comment**
PrimaryKey	Integer	Int64	
DateTimeStamp	DateTime		
DateTimeStampLocal	DateTime		

DateTimeStampUtc	DateTime		
InstrumentId	Integer	Byte	
ResultPrimaryKey	Integer	Int64	
FwVersion	Integer	Int64	
FpgaVersion	Integer	Int64	
BoardId	Integer	Int32	
UniqueDataKey	Integer	Int64	
DataGenerationTimestamp	DateTime		
DataGenerationTimestampLocal	DateTime		
DataGenerationTimestampUtc	DateTime		

DeviceType	Integer	Int32	DeviceTypeName
			{
			UnknownDeviceType = -1,
			Solenoid = 0,
			PMSensor =1,
			FlowSensor = 2,
			TempSensor = 3,
			VacSensor = 4,
			Heater = 5,
			Wam = 6,
			InductionHeater = 7
			}

DeviceId	Integer	Int32	
CommandId	Integer	Int64	
ResponseId	Integer	Int64	
TestId	Integer	Int64	
SampleInterval	Integer	Int32	
NumberOfSamples	Integer	Int32	
SampleLength	Integer	Int32	
HeaterNumber	Integer	Int32	
Pwm	Integer	Int64	
AverageTemperature	Real	Double	
SetPoint	Real	Double	
KProportional	Real	Double	
KIntegral	Real	Double	
KDerivative	Real	Double	
LSumMax	Real	Double	
LSumMin	Real	Double	
Integral	Real	Double	
Error	Real	Double	
Output	Real	Double	

ControllerLocation	Integer	Byte	ControllerLocationName
			{
			IA1,
			IA2,
			IA3,
			IA4,
			IA5,
			RSH
			}

4.3.31 IArm Data

Resource Name: IArm			
Field	**Type**	**Size**	**Format/Comment**
PrimaryKey	Integer	Int64	
DateTimeStamp	DateTime		
DateTimeStampLocal	DateTime		
DateTimeStampUtc	DateTime		
InstrumentId	Integer	Byte	

Operation	Integer	Byte	OperationName
			{
			Flush = 0,
			Fill = 1
			}

State	Integer	Byte	StateName
			{
			UnknownOperationState = 0,
			FlushToWaste = 1,
			FlushConductivityCheck = 2,
			FillingCheck = 3
			}

ErrorCode	Integer	Int32	
ErrorMessage	String	250	ErrorCode field as a string
Conductivity	Integer	Int32	
Temperature	Integer	Int32	
MotorRotationCount	Integer	Int32	
ReadCount	Integer	Int32	
UncompensatedConductivity	Integer	Int32	
MinimumConductivity	Integer	Int32	
MaximumConductivity	Integer	Int32	
ConductivityOffset	Integer	Int32	This value is used to compute the corrected conductivity. **CorrectedConductivity = Conductivity + Offset** Conductivity is in range if CorrectedConductivity is greater than or equal to MinimumConductivity and less than or equal to MaximumConductivity

ControllerLocation	Integer	Byte	ControllerLocationName
			{
			IA1,
			IA2,
			IA3,
			IA4,
			IA5,
			RSH
			}

4.3.32 Icb Motor Move

Resource Name: IcbMotorMove			
Field	**Type**	**Size**	**Format/Comment**
PrimaryKey	Integer	Int64	
DateTimeStamp	DateTime		
DateTimeStampLocal	DateTime		
DateTimeStampUtc	DateTime		
InstrumentId	Integer	Byte	
ResultPrimaryKey	Integer	Int64	

Interface	Integer	Byte	InterfaceName
			{
			IntegratedMotor,
			DigitalIO,
			SerialIO,
			JADAKBCR,
			Cooler,
			LGenericICQCommunicationsBoard,
			LReagent1CommunicationsBoard,
			LReagent2CommunicationsBoard,
			LSampleCommunicationsBoard,
			LUpperControllerBoard,
			LPumpAndValveControllerBoard,
			LTemperatureAndOpticsControllerBoard,
			LLowerControllerBoard,
			LRVLoaderAndCRAControllerBoard,
			LInductionHeatingControllerBoard,
			LSHCommandModuleControlBoard,
			LSHLoadUnloadModule1Board,
			LSHLoadUnloadModule2Board,
			LSHLoadUnloadModule3Board,
			LSHLoadUnloadModule4Board,
			LSHLoadUnloadModule5Board,
			LSHCCPM1Board,
			LSHCCPM2Board,
			LSHCCPM3Board,
			LSHCCPM4Board,
			LSHCCPM5Board,
			QSim,
			NoInterface
			}

MotorNumber	Integer	Int32	
MotorName	String	40	
TestId	Integer	Int32	
CommandIdentifier	Integer	Int32	The Tx/Rx ID used to identify the command/response.

CommandDescription	String	80	This field will have the following values: HOME_MOTOR HOME_MOTOR_ASYNCH MOTOR_MOVE_ABS MOTOR_MOVE_ABS_ASYNCH MOTOR_MOVE_REL MOTOR_MOVE_REL_ASYNCH MOTOR_MOVE_STOP MOTOR_MOVE_SLEW
CommandArgument	Integer	Int32	1. If CommandDescription = HOME_MOTOR or HOME_MOTOR_ASYNCH then this value is 0. 2. If CommandDescription = MOTOR_MOVE_ABS or MOTOR_MOVE_ABS_ASYNCH or MOTOR_MOVE_REL or MOTOR_MOVE_REL_ASYNCH this value is the distance that the motor is asked to move. 3. If CommandDescription = MOTOR_MOVE_STOP then this value is the deceleration to stop. 4. If CommandDescription = MOTOR_MOVE_SLEW then this value is the final velocity.
MoveTime	Integer	Int32	The time in milliseconds it took to complete the move.
MoveDescription	String	256	
ErrorCode	Integer	Int32	
AdditionalErrorCodes	String	120	

ControllerLocation	Integer	Byte	ControllerLocationName
			{
			IA1,
			IA2,
			IA3,
			IA4,
			IA5,
			RSH
			}

4.3.33 InductionHeaterRunProfileResponseData

Resource name: InductionHeaterRunProfileResponseData			
Field	**Type**	**Size**	**Format/Comments**
PrimaryKey	Integer	Int64	
DateTimeStamp	DateTime		
DateTimeStampLocal	DateTime		
DateTimeStampUtc	DateTime		
InstrumentId	Integer	Byte	

PipettorArm	Integer	Byte	PipettorArmName
			{
			NoPipettorMechanism = 0,
			SamplePipettorMechanism = 1,
			Reagent1PipettorMechanism = 2,
			Reagent2PipettorMechanism = 3
			}

Channel	Integer	Int32	

ResultPrimaryKey1	Integer	Int64	
TestId1	Integer	Int32	
ResultPrimaryKey2	Integer	Int64	
TestId2	Integer	Int32	
CoilTempMax	Integer	Int32	
BdTempMax	Integer	Int32	
Fet1TempMax	Integer	Int32	
Fet2TempMax	Integer	Int32	
VoltageMax	Integer	Int32	
CurrentMax	Integer	Int32	
PowerMax	Integer	Int32	
FrequencyMax	Integer	Int32	
FrequencyMin	Integer	Int32	
FaultFlag	Integer	Byte	
FaultBitField0	Integer	Int32	
FaultBitField1	Integer	Int32	
HardFaultBitField0	Integer	Int32	
HardFaultBitField1	Integer	Int32	
SoftFaultBitField0	Integer	Int32	
SoftFaultBitField1	Integer	Int32	
CoilTempMaxLowerLimit	Integer	Int32	
CoilTempMaxUpperLimit	Integer	Int32	
BoardTempMaxLowerLimit	Integer	Int32	
BoardTempMaxUpperLimit	Integer	Int32	
Fet1TempMaxLowerLimit	Integer	Int32	
Fet1TempMaxUpperLimit	Integer	Int32	
Fet2TempMaxLowerLimit	Integer	Int32	
Fet2TempMaxUpperLimit	Integer	Int32	
VoltageMaxLowerLimit	Integer	Int32	
VoltageMaxUpperLimit	Integer	Int32	
CurrentMaxLowerLimit	Integer	Int32	
CurrentMaxUpperLimit	Integer	Int32	
PowerMaxLowerLimit	Integer	Int32	
PowerMaxUpperLimit	Integer	Int32	
FrequencyMaxLowerLimit	Integer	Int32	
FrequencyMaxUpperLimit	Integer	Int32	
FrequencyMinLowerLimit	Integer	Int32	
FrequencyMinUpperLimit	Integer	Int32	
UniqueDataKeyPower	Integer	Int64	
UniqueDataKeyCurrent	Integer	Int64	
UniqueDataKeyVoltage	Integer	Int64	
UniqueDataKeyFrequency	Integer	Int64	

ControllerId	Integer	Byte	ControllerIdName
			{
			IA1,
			IA2,
			IA3,
			IA4,
			IA5,
			RSH
			}

4.3.34 InductionHeaterWaveformData

Resource name: InductionHeaterWaveformData			
Field	**Type**	**Size**	**Format/Comments**
PrimaryKey	Integer	Int64	
DateTimeStamp	DateTime		
DateTimeStampLocal	DateTime		
DateTimeStampUtc	DateTime		
InstrumentId	Integer	Byte	
FwVersion	Integer	Int64	
FpgaVersion	Integer	Int64	
DataGenerationTimestamp	DateTime		
DataGenerationTimestampLocal	DateTime		
DataGenerationTimestampUtc	DateTime		
BoardId	Integer	Int32	
UniqueDataKey	Integer	Int64	

DeviceType	Integer	Int32	DeviceTypeName
			{
			UnknownDeviceType = -1,
			Solenoid = 0,
			PMSensor = 1,
			FlowSensor = 2,
			TempSensor = 3,
			VacSensor = 4,
			Heater = 5,
			Wam = 6,
			InductionHeater = 7
			}

DeviceId	Integer	Int32	
NumberOfSamples	Integer	Int32	
SampleRate	Integer	Int32	

DataUnits	Integer	Int32	DataUnitsName
			{
			UnknownDataUnit = -1,
			AdcCounts = 0,
			AdcFilteredCounts = 1,
			CurrentInMilliAmps = 2,
			VoltageInMilliVolts = 3,
			Percentage = 4,
			PowerInMilliWatts = 5,
			PowerInWatts = 6,
			FrequencyInHertz = 7,
			FrequencyInKiloHertz = 8
			}

ErrorStatus	Integer	Int32	

PayloadType	Integer	Byte	PayloadTypeName
			{
			PayloadUnknown = 0,
			Frequency = 1,
			Voltage = 2,
			Current = 3,
			Power = 4
			}

PayloadDataType	Integer	Byte	PayloadDataTypeName
			{
			Mixed = 0,
			Uint8 = 1,
			Int8 = 2,
			Uint16 = 3,
			Int16 = 4,
			Uint32 = 5,
			Int32 = 6,
			Uint64 = 7,
			Int64 = 8,
			Float = 9,
			Double = 10
			}

PayloadData	String	7900	
Channel	Integer	Int32	

ControllerId	Integer	Byte	ControllerIdName
			{
			IA1,
			IA2,
			IA3,
			IA4,
			IA5,
			RSH
			}

4.3.35 Instrument Activity Data

Resource name: InstrumentActivity			
Field	**Type**	**Size**	**Format/Comments**
PrimaryKey	Integer	Int64	
DateTimeStamp	DateTime		
DateTimeStampLocal	DateTime		
DateTimeStampUtc	DateTime		
InstrumentId	Integer	Byte	
Component	String	1024	
Activity	String	1024	

Module	Integer	Byte	ModuleName
			{
			IA1,
			IA2,
			IA3,
			IA4,
			IA5,
			RSH,
			SCC
			}

4.3.36 ITV Data

Resource Name: ITVData			
Field	**Type**	**Size**	**Format/Comment**
PrimaryKey	Integer	Int64	

DateTimeStamp	DateTime		
DateTimeStampLocal	DateTime		
DateTimeStampUtc	DateTime		
InstrumentId	Integer	Byte	
ResultPrimaryKey	Integer	Int64	
TestId	Integer	Int32	

ItvMechanism	Integer	Byte	ItvMechanismName
			{
			Reagent1Itv1Mechanism,
			Reagent2Itv2Mechanism,
			PretreatItv3Mechanism,
			PretriggerItv4Mechanism
			}

MotorNumber	Integer	Int32	

ItvStatus	Integer	Byte	ItvStatusName
			{
			Engage,
			MixVerify,
			MixComplete,
			Disengage,
			Stop
			}

RequestedSpeed	Integer	Int32	
ActualSpeed	Integer	Int32	For the "Stop" ItvStatus, this represents the ITV speed at which the stop was requested
SpeedErrorCode	Integer	Int32	
SpeedErrorMessage	String	250	SpeedErrorCode field as a string
PositionErrorCode	Integer	Int32	
PositionErrorMessage	String	250	PositionErrorCode field as a string

MoveDirection	Integer	Byte	MoveDirectionName
			{
			Reverse,
			Forward,
			UnknownDirection
			}

EnableState	Integer	Byte	EnableStateName
			{
			Disabled,
			Enabled,
			UnknownEnableState
			}

BrakeState	Integer	Byte	BrakeStateName
			{
			BrakeOff,
			BrakeOn,
			UnknownBrakeState
			}

SensorPosition	Integer	Byte	SensorPositionName
			{
			Down,
			Up,
			UnknownSensorPosition
			}

SpeedState	Integer	Byte	SpeedStateName
			{
			NotAtSpeed,
			UpToSpeed,
			UnknownSpeedState
			}

PwmValue	Integer	Int32	

ControllerLocation	Integer	Byte	ControllerLocationName
			{
			IA1,
			IA2,
			IA3,
			IA4,
			IA5,
			RSH
			}

4.3.37 Liquid-level Detection Data

Resource name: LLD			
Field	**Type**	**Size**	**Format/Comment**
PrimaryKey	Integer	Int64	
DateTimeStamp	DateTime		
DateTimeStampLocal	DateTime		
DateTimeStampUtc	DateTime		
InstrumentId	Integer	Byte	
ResultPrimaryKey	Integer	Int64	Primary key of related Result data record.
TestId	Integer	Int32	
Lockstep	Integer	Int32	
AssayNumber	Integer	Int32	

PipettingProtocol	Integer	Int32	PipettingProtocolName
			{
			RoutineSampleProtocol,
			PretreatTransferProtocol1,
			PretreatTransferProtocol2,
			StatSampleProtocol,
			Reagent1Protocol,
			PretreatReagent1Protocol1,
			PretreatReagent1Protocol2,
			Reagent2Protocol,
			NonPipettingProtocol
			}

PipettingStep	Integer	Int32	

WellLocation	Integer	Byte	WellLocationName
			{
			SampleOuterPositioner,
			SampleInnerPositioner,
			SampleLasPosition,
			PretreatSampleStart,
			PretreatSampleComplete,
			PretreatReagent1,
			Rv1AssayStart,
			Rv2Reagent1Dispense,
			Reagent2Dispense,
			Reagent1PipetterInnerReagentTrackWell,
			Reagent1PipetterMiddleReagentTrackWell,
			Reagent1PipetterOuterReagentTrackWell,
			Reagent2PipetterInnerReagentTrackWell,
			Reagent2PipetterMiddleReagentTrackWell,
			Reagent2PipetterOuterReagentTrackWell,
			WashCup,
			WasteCup,
			InactiveWell
			}

PipettorMechanism	Integer	Byte	PipettorMechanismName
			{
			NoPipettorMechanism,
			SamplePipettorMechanism,
			Reagent1PipettorMechanism,
			Reagent2PipettorMechanism
			}

WedgeNumber	Integer	Int32	
ActivityResult	String	80	
FluidFoundStep	Integer	Int32	

ControllerLocation	Integer	Byte	ControllerLocationName
			{
			IA1,
			IA2,
			IA3,
			IA4,
			IA5,
			RSH
			}

4.3.38 Liquid-level Detection Noise Data

Resource name: LLDNoiseData

Field	Type	Size	Format/Comment
PrimaryKey	Integer	Int64	
DateTimeStamp	DateTime		
DateTimeStampLocal	DateTime		
DateTimeStampUtc	DateTime		
InstrumentId	Integer	Byte	
ResultPrimaryKey	Integer	Int64	
Lockstep	Integer	Int32	
TestId	Integer	Int32	

WellLocation	Integer	Byte	WellLocationName
			{
			SampleOuterPositioner,
			SampleInnerPositioner,
			SampleLasPosition,
			PretreatSampleStart,
			PretreatSampleComplete,
			PretreatReagent1,
			Rv1AssayStart,
			Rv2Reagent1Dispense,
			Reagent2Dispense,
			Reagent1PipetterInnerReagentTrackWell,
			Reagent1PipetterMiddleReagentTrackWell,
			Reagent1PipetterOuterReagentTrackWell,
			Reagent2PipetterInnerReagentTrackWell,
			Reagent2PipetterMiddleReagentTrackWell,
			Reagent2PipetterOuterReagentTrackWell,
			WashCup,
			WasteCup,
			InactiveWell
			}

PipettorMechanism	Integer	Byte	PipettorMechanismName
			{
			NoPipettorMechanism,
			SamplePipettorMechanism,
			Reagent1PipettorMechanism,
			Reagent2PipettorMechanism
			}

WedgeNumber	Integer	Int32	
LlsNoise	Integer	Int32	
LlsMin	Integer	Int32	
LlsAvg	Integer	Int32	
LlsMax	Integer	Int32	
Description	String	80	

ControllerId	Integer	Byte	ControllerIdName
			{
			IA1,
			IA2,
			IA3,
			IA4,
			IA5,
			RSH
			}

4.3.39 Low Level Operation Data

Resource name: LowLevelOperation			
Field	**Type**	**Size**	**Format/Comment**
PrimaryKey	Integer	Int64	
DateTimeStamp	DateTime		
DateTimeStampLocal	DateTime		
DateTimeStampUtc	DateTime		
InstrumentId	Integer	Byte	

LowLevelInterface	Integer	Byte	LowLevelInterfaceName
			{
			IntegratedMotor,
			DigitalIO,
			SerialIO,
			JADAKBCR,
			Cooler,
			LGenericICQCommunicationsBoard,
			LReagent1CommunicationsBoard,
			LReagent2CommunicationsBoard,
			LSampleCommunicationsBoard,
			LUpperControllerBoard,
			LPumpAndValveControllerBoard,
			LTemperatureAndOpticsControllerBoard,
			LLowerControllerBoard,
			LRVLoaderAndCRAControllerBoard,
			LInductionHeatingControllerBoard,
			LSHCommandModuleControlBoard,
			LSHLoadUnloadModule1Board,
			LSHLoadUnloadModule2Board,
			LSHLoadUnloadModule3Board,
			LSHLoadUnloadModule4Board,
			LSHLoadUnloadModule5Board,
			LSHCCPM1Board,
			LSHCCPM2Board,
			LSHCCPM3Board,
			LSHCCPM4Board,
			LSHCCPM5Board,
			QSim,
			NoInterface
			}

Lockstep	Integer	Int32	

MotorOperation	Integer	Byte	MotorOperationName
			{
			NotAMotorOperation,
			MotorHome,
			MotorMoveStart,
			MotorMoveComplete
			}

Motor	String	5	Specifies the motor number if this is a Meridian motor operation.
Description	String	256	

ControllerLocation	Integer	Byte	ControllerLocationName
			{
			IA1,
			IA2,
			IA3,
			IA4,
			IA5,
			RSH
			}

4.3.40 Optics Raw Data

Resource name: OpticsRawData			
Field	**Type**	**Size**	**Format/Comment**
PrimaryKey	Integer	Int64	
DateTimeStamp	DateTime		
DateTimeStampLocal	DateTime		
DateTimeStampUtc	DateTime		

InstrumentId	Integer	Byte	
ResultPrimaryKey	Integer	Int64	Primary key of related Result data record.
TestId	Integer	Int32	

OpticsReadDataType	Integer	Byte	OpticsReadDataTypeName
			{
			ForegroundUnfilteredRead,
			ForegroundFilteredRead,
			ForegroundFinalRead,
			SccNormalizedForegroundFinalRead,
			BackgroundUnfilteredRead,
			BackgroundFilteredRead,
			BackgroundFinalRead,
			SccNormalizedBackgroundFinalRead,
			UnknownReadType
			}

RawReads	String	7900	Logged PM reads

ControllerId	Integer	Byte	ControllerIdName
			{
			IA1,
			IA2,
			IA3,
			IA4,
			IA5,
			RSH
			}

4.3.41 Pipettor Syringe Backlash Data

Resource name: PipettorSyringeBacklashData

Field	Type	Size	Format/Comment
PrimaryKey	Integer	Int64	
DateTimeStamp	DateTime		
DateTimeStampLocal	DateTime		
DateTimeStampUtc	DateTime		
InstrumentId	Integer	Byte	

PipettorArm	Integer	Byte	PipettorArmName
			{
			NoPipettorMechanism,
			SamplePipettorMechanism,
			Reagent1PipettorMechanism,
			Reagent2PipettorMechanism
			}

IterationNumber	Integer	Int32	
PositiveHomeCount	Integer	Int32	
NegativeHomeCount	Integer	Int32	
PositiveHomePosition	Integer	Int32	
NegativeHomePosition	Integer	Int32	
DifferenceInHomePosition	Integer	Int32	

ControllerId	Integer	Byte	ControllerIdName
			{
			IA1,
			IA2,
			IA3,
			IA4,
			IA5,
			RSH
			}

4.3.42 PM Event Data

Resource name: PMEvent			
Field	**Type**	**Size**	**Format/Comment**
PrimaryKey	Integer	Int64	
DateTimeStamp	DateTime		
DateTimeStampLocal	DateTime		
DateTimeStampUtc	DateTime		
InstrumentId	Integer	Byte	
ResultPrimaryKey	Integer	Int64	Primary key of related Result data record.
TestId	Integer	Int32	
Lockstep	Integer	Int32	
AssayNumber	Integer	Int32	

PipettingProtocol	Integer	Int32	PipettingProtocolName
			{
			RoutineSampleProtocol,
			PretreatTransferProtocol1,
			PretreatTransferProtocol2,
			StatSampleProtocol,
			Reagent1Protocol,
			PretreatReagent1Protocol1,
			PretreatReagent1Protocol2,
			Reagent2Protocol,
			NonPipettingProtocol
			}

PipettingStep	Integer	Int32	

WellLocation	Integer	Byte	WellLocationName
			{
			SampleOuterPositioner,
			SampleInnerPositioner,
			SampleLasPosition,
			PretreatSampleStart,
			PretreatSampleComplete,
			PretreatReagent1,
			Rv1AssayStart,
			Rv2Reagent1Dispense,
			Reagent2Dispense,
			Reagent1PipetterInnerReagentTrackWell,
			Reagent1PipetterMiddleReagentTrackWell,
			Reagent1PipetterOuterReagentTrackWell,
			Reagent2PipetterInnerReagentTrackWell,
			Reagent2PipetterMiddleReagentTrackWell,
			Reagent2PipetterOuterReagentTrackWell,
			WashCup,
			WasteCup,
			InactiveWell
			}

PipettorMechanism	Integer	Byte	PipettorMechanismName
			{
			NoPipettorMechanism,
			SamplePipettorMechanism,
			Reagent1PipettorMechanism,
			Reagent2PipettorMechanism
			}

LiquidVolume	Integer	Int32	
PmResult	Integer	Int32	
FrontEndPressure	Integer	Int32	
AspiratePressure	Integer	Int32	
BackEndPressure	Integer	Int32	
ShapeScore	Integer	Int32	
DiscordScore	Integer	Int32	
ClotScore	Integer	Int32	
SlopeScore	Integer	Int32	

ControllerLocation	Integer	Byte	ControllerLocationName
			{
			IA1,
			IA2,
			IA3,
			IA4,
			IA5,
			RSH
			}

4.3.43 PM Raw Data

Resource name: PMRawData

Field	Type	Size	Format/Comment
PrimaryKey	Integer	Int64	
DateTimeStamp	DateTime		
DateTimeStampLocal	DateTime		
DateTimeStampUtc	DateTime		
InstrumentId	Integer	Byte	
ResultPrimaryKey	Integer	Int64	Primary key of related Result data record.
TestId	Integer	Int32	
Lockstep	Integer	Int32	
AssayNumber	Integer	Int32	

PipettingProtocol	Integer	Int32	PipettingProtocolName
			{
			RoutineSampleProtocol,
			PretreatTransferProtocol1,
			PretreatTransferProtocol2,
			StatSampleProtocol,
			Reagent1Protocol,
			PretreatReagent1Protocol1,
			PretreatReagent1Protocol2,
			Reagent2Protocol,
			NonPipettingProtocol
			}

PipettingStep	Integer	Int32	

WellLocation	Integer	Byte	WellLocationName
			{
			SampleOuterPositioner,
			SampleInnerPositioner,
			SampleLasPosition,
			PretreatSampleStart,
			PretreatSampleComplete,
			PretreatReagent1,
			Rv1AssayStart,
			Rv2Reagent1Dispense,
			Reagent2Dispense,
			Reagent1PipetterInnerReagentTrackWell,
			Reagent1PipetterMiddleReagentTrackWell,
			Reagent1PipetterOuterReagentTrackWell,
			Reagent2PipetterInnerReagentTrackWell,
			Reagent2PipetterMiddleReagentTrackWell,
			Reagent2PipetterOuterReagentTrackWell,
			WashCup,
			WasteCup,
			InactiveWell
			}

PipettorMechanism	Integer	Byte	PipettorMechanismName
			{
			NoPipettorMechanism,
			SamplePipettorMechanism,
			Reagent1PipettorMechanism,
			Reagent2PipettorMechanism
			}

Volume	Integer	Int32	
LoggedRawReads	String	7900	Logged PM reads. The first 22 values are the following: 1. Response ID 2. FW Version 3. Syringe Velocity 4. Error State 5. Front End Pressure 6. Aspirate Pressure 7. Back End Pressure 8. Shape Score 9. PSI Discord 10. Clot Score 11. Slope Score 12. Start Syringe 13. Stop Syringe 14. Bathtub Point 1 15. Bathtub Point 2 16. Bathtub Point 3 17. Bathtub Point 4 18. Bathtub Point 5 19. Bathtub Point 6 20. Bathtub Point 7 21. Bathtub Point 8 22. Bathtub Point 9 The raw reads follow after that.

ControllerLocation	Integer	Byte	ControllerLocationName
			{
			IA1,
			IA2,
			IA3,
			IA4,
			IA5,
			RSH
			}

4.3.44 Reagent Cooler Data

Resource name: ReagentCoolerData			
Field	**Type**	**Size**	**Format/Comment**
PrimaryKey	Integer	Int64	
DateTimeStamp	DateTime		
DateTimeStampLocal	DateTime		
DateTimeStampUtc	DateTime		
InstrumentId	Integer	Byte	
Register	Integer	Int32	

ValueType	Integer	Byte	ValueTypeName
			{
			IntegerType,
			FloatType,
			UnsignedIntegerType
			}

IntegerValue	Integer	Int32	
UnsignedIntegerValue	Integer	Int64	
FloatValue	Real	Double	
Description	String	500	

ControllerLocation	Integer	Byte	ControllerLocationName
			{
			IA1,
			IA2,
			IA3,
			IA4,
			IA5,
			RSH
			}

4.3.45 Reagent Operation Data

Resource name: ReagentOperation			
Field	**Type**	**Size**	**Format/Comment**
PrimaryKey	Integer	Int64	
DateTimeStamp	DateTime		
DateTimeStampLocal	DateTime		
DateTimeStampUtc	DateTime		
InstrumentId	Integer	Byte	
ReagentActivity	String	160	

ControllerLocation	Integer	Byte	ControllerLocationName
			{
			IA1,
			IA2,
			IA3,
			IA4,
			IA5,
			RSH
			}

4.3.46 Teknic Motor

Resource Name: TeknicMotor			
Field	**Type**	**Size**	**Format/Comment**
PrimaryKey	Integer	Int64	

DateTimeStamp	DateTime		
DateTimeStampLocal	DateTime		
DateTimeStampUtc	DateTime		
InstrumentId	Integer	Byte	

Motor	Integer	Byte	MotorName
			{
			Reagent1Z = 0,
			Reagent1Theta = 1,
			ReagentCarousel = 2,
			Dispersion = 3,
			Reagent2Z = 4,
			Reagent2Theta = 5,
			SampleZ = 6,
			SampleTheta = 7,
			TransportX = 8,
			NoMeridianMotorIdentified = 9
			}

LowPassRms	Real	Double	
LowPassMaxPos	Real	Double	
LowPassMaxNeg	Real	Double	
HighPassRms	Real	Double	
Duration	Real	Double	
MaxTrackingPos	Integer	Int32	
MaxTrackingNeg	Integer	Int32	
MoveSteps	Integer	Int32	
MoveDescription	String	50	
Acceleration	Integer	Int32	
Deceleration	Integer	Int32	
BaseVelocity	Integer	Int32	
FinalVelocity	Integer	Int32	

ControllerLocation	Integer	Byte	ControllerLocationName
			{
			IA1,
			IA2,
			IA3,
			IA4,
			IA5,
			RSH
			}

4.3.47 Temperature Data

Resource Name: TemperatureData			
Field	**Type**	**Size**	**Format/Comment**
PrimaryKey	Integer	Int64	
DateTimeStamp	DateTime		
DateTimeStampLocal	DateTime		
DateTimeStampUtc	DateTime		
InstrumentId	Integer	Byte	

TemperatureZone	Integer	Byte	TemperatureZoneName
			{
			Washzone1BufferZone = 0,
			Washzone2BufferZone = 1,
			ProcessPathZone1 = 2,
			ProcessPathZone2 = 3,
			ProcessPathZone3 = 4,
			ProcessPathZone4 = 5,
			ProcessPathZone5 = 6,
			ProcessPathZone6 = 7,
			TriggerPretriggerZone = 8,
			ReagentCoverHeaterZone1 = 9,
			ReagentCoverHeaterZone2 = 10,
			Reagent1Zone = 11,
			Reagent2Zone = 12,
			AmbientZone = 13
			}

Temperature	Integer	Int32	
ErrorCode	Integer	Int32	
ErrorMessage	String	250	
ActivityInfo	String	80	

ControllerLocation	Integer	Byte	ControllerLocationName
			{
			IA1,
			IA2,
			IA3,
			IA4,
			IA5,
			RSH
			}

4.3.48 Vacuum Pressure Data

Resource Name: VacuumPressureData			
Field	**Type**	**Size**	**Format/Comment**
PrimaryKey	Integer	Int64	

DateTimeStamp	DateTime		
DateTimeStampLocal	DateTime		
DateTimeStampUtc	DateTime		
InstrumentId	Integer	Byte	

VacuumState	Integer	Byte	VacuumStateName
			{
			UnknownVacuumState = 0,
			BleedVacuum1 = 1,
			MonitorBleedLevel1 = 2,
			ChargeWastePump = 3,
			MonitorWastePumpChargeLevel = 4,
			BleedVacuum2 = 5,
			MonitorBleedLevel2 = 6,
			ChargeVacuumPump = 7,
			MonitorVacuumPumpChargeLevel = 8,
			InitiateLeakTest = 9,
			ConcludeLeakTest = 10,
			BleedVacuum3 = 11,
			MonitorBleedLevel3 = 12,
			VerifyVacuum = 13,
			VacuumBledOff = 14
			}
			
			Typically the data in these states:
			BleedVacuum2, MonitorBleedLevel2, ChargeVacuumPump, InitiateLeakTest, BleedVacuum3 and MonitorBleedLevel3
			are recorded if there is a hardware error

VerifyVacuumSubstate	Integer	Byte	VerifyVacuumSubstateName
			{
			UnknownVacuumSubState = 0,
			EnableVacuum = 1,
			ActiveVacuum = 2,
			DisableVacuum = 3
			}
			This state has relevance only when VacuumState field is "VerifyVacuum"

AdcValue	Integer	Int32	When the VacuumState is "PerformLeakTest" this field represents the baseline ADC value.
PsigValue	Real	Double	When the VacuumState is "PerformLeakTest" this field represents the baseline PSIG value.
AdcValueLeakTest	Integer	Int32	The default value is 0. This field is valid only when the VacuumState is "PerformLeakTest". This represents the ADC value after the vacuum was stopped.
PsigValueLeakTest	Real	Double	The default value is 0, This field is valid only when the VacuumState is "PerformLeakTest". This represents the PSIG value after the vacuum was stopped.
ErrorCode	Integer	Int32	
ErrorMessage	String	250	ErrorCode field as a string

BledMaxLevel	Integer	Int32	During the `DrainReservoir` state the pressure is checked against this value.
BledMinLevel	Integer	Int32	During the `DrainReservoir` state the pressure is checked against this value.
MinimumBaselinePressure	Integer	Int32	During initialization the pressure is checked against this value.
MinimumPressure	Integer	Int32	During lockstep processing the pressure is checked against this value.
VacuumPumpOutput	Integer	Int32	This is used to when the vacuum pump is turned on.
VacuumMuchTooHigh	Integer	Int32	
WastePumpThreshold	Integer	Int32	
VacuumPumpThreshold	Integer	Int32	
LeakTestMaximum	Integer	Int32	

ControllerLocation	Integer	Byte	ControllerLocationName
			{
			`IA1,`
			`IA2,`
			`IA3,`
			`IA4,`
			`IA5,`
			`RSH`
			}

4.3.49 WAM Bulk Raw Data

Resource Name: WamBulkData			
Field	**Type**	**Size**	**Format/Comment**
PrimaryKey	Integer	Int64	
DateTimeStamp	DateTime		
DateTimeStampLocal	DateTime		
DateTimeStampUtc	DateTime		
InstrumentId	Integer	Byte	
ResultPrimaryKey	Integer	Int64	
FwVersion	Integer	Int64	
FpgaVersion	Integer	Int64	
DataGenerationTimestamp	DateTime		
DataGenerationTimestampLocal	DateTime		
DataGenerationTimestampUtc	DateTime		
BoardId	Integer	Int32	
UniqueDataKey	Integer	Int64	

DeviceType	Integer	Byte	DeviceTypeName
			{
			UnknownDeviceType = -1,
			Solenoid = 0,
			PMSensor = 1,
			FlowSensor = 2,
			TempSensor = 3,
			VacSensor = 4,
			Heater = 5,
			Wam = 6,
			InductionHeater = 7
			}

DeviceId	Integer	Int32	
CommandId	Integer	Int64	
ResponseId	Integer	Int64	
WashzoneNumber	Integer	Byte	
FifoNumber	Integer	Int32	
TestId	Integer	Int64	
Lockstep	Integer	Int32	
ProbePosition	Integer	Int32	
Volume	Integer	Int32	
SampleLength	Integer	Int32	
WaveformData	String	7900	

ControllerId	Integer	Byte	ControllerIdName
			{
			IA1 = 0,
			IA2 = 1,
			IA3 = 2,
			IA4 = 3,
			IA5 = 4,
			RSH = 5
			}

4.3.50 WAM Data

Resource Name: WAMData			
Field	**Type**	**Size**	**Format/Comment**
PrimaryKey	Integer	Int64	
DateTimeStamp	DateTime		
DateTimeStampLocal	DateTime		
DateTimeStampUtc	DateTime		
InstrumentId	Integer	Byte	
ResultPrimaryKey	Integer	Int64	
Position	Integer	Int32	
TestId	Integer	Int32	
Volume	Integer	Int32	
TimeToLiquid	Integer	Int32	
EmptyCount	Integer	Int32	
TimeOffset	Integer	Int32	
LowVolume	Integer	Int32	
HighVolume	Integer	Int32	
EmptyTolerance	Integer	Int32	

WamStatus	Integer	Byte	WamStatusName
			{
			WAMSuccess = 0,
			RvVolumeOutOfDetectedRange = 1,
			EmptyCountResultBelowThreshold = 2,
			VolumeRangeNotFoundInConfigTable = 3,
			FailedToDetectLiquidInRV = 4
			}

ControllerLocation	Integer	Byte	ControllerLocationName
			{
			IA1,
			IA2,
			IA3,
			IA4,
			IA5,
			RSH
			}

Washzone	Integer	Int32	

Service Operations

The ODR provides service operations to perform operations on the data. Like the OData data services, the service operations are addressed using URI.

A service operation has three main parts

- Service Root URL
- Service Operation
- Parameters

The same service root is used to invoke ODR service operations.

```
http://localhost:11000/ODR.svc
```

The *service operation* specifies the name of the operation to invoke. The name of service operation follows the service root.

```
http://localhost:11000/ODR.svc/Foo
```

Foo is the name of the service operation.

The service operation may optional support parameters that a consumer can use to specify values for an operation. The service operation parameters follow the name of the service operation.

```
http://localhost:11000/ODR.svc/Foo?Bar=100&Bee=200
```

Bar is a service operation parameter with the value of 100. *Bee* is a service operation parameter with the value of 200.

5.1 Aggregate Functions

The ODR provides aggregate functions for statistical calculations over a collection of records. The aggregate functions are accessed via invocation of the ODR service operation *GetAggregate*.

The *GetAggregate* service operation has the following parameters:

operation	The aggregate function to invoke (required)
resource	The name of the resource to query (required)
column	The name of the field to aggregate (required)
with	The query filter using OData syntax (optional)
orderby	The sort order for the result set using Odata syntax (optional)
top	Specifies the number of records to retrieve at the top (optional)

All *GetAggregate* service operation parameter values are required to be enclosed by single-quotes (‘’).

operation=‘Count’

resource=‘LLDs’

column=‘Volume’

orderby=‘DateTimeStamp’

top=‘100’

The following aggregate functions (operation) are supported:

Count	Count the number of records
Sum	Compute the sum of a field
Avg	Compute the average of a field
Max	Compute the maximum value of a field
Min	Compute the minimum value of a field
StDev	Compute the population standard deviation of a field
StDevS	Compute the sample standard deviation of a field
Var	Compute the population variance of a field
VarS	Compute the sample variance of a field

Example 1: Compute the (population) standard deviation for all result dark counts

```
http://localhost:11000/ODR.svc/GetAggregate?operation='StDev'&resource='Result'&column='IntegratedDarkCount'
```

Example 2: Calculate the Result dark count average for a given date range.

```
http://localhost:11000/ODR.svc/GetAggregate?operation='Avg'&resource='Result'&column='IntegratedDarkCount'&with='TestCompletionDate >= “2013-01-23 12:00:00” and TestCompletionDate <= “2013-01-23 14:00:00”’
```

Example 3: Count the number of Result records with dark counts over 50 for a given date range, process path and processing lane.

```
http://localhost:11000/ODR.svc/GetAggregate?operation='Count'&resource='Result'&column='IntegratedDarkCount'&with='IntegratedDarkCount > 50 and TestCompletionDate >= “2013-01-23 12:00:00” and TestCompletionDate <= “2013-01-23 14:00:00” and ProcessPath = 1 and ProcessingLane = 1’
```

Example 4: Calculate the average of the lowest 50 dark counts for a given date range, process path and processing lane.

```
http://localhost:11000/ODR.svc/GetAggregate?operation='Avg'&resource='Result'&column='IntegratedDarkCount'&orderby='IntegratedDarkCount asc'&top=’50’&with=’TestCompletionDate >= “2013-01-23 12:00:00” and TestCompletionDate <= “2013-01-23 14:00:00” and ProcessPath = 1 and ProcessingLane = 1’
```

Note that the orderby parameter is used to sort the dark count from lowest to highest; and the top parameter is used to select the first 50 records. Note that the top parameter value is required to be enclosed in single-quotes (‘50’) even though it is numeric.

Example 5: Calculate the average of the highest 50 dark counts for a given date range, process path and processing lane.

```
http://localhost:11000/ODR.svc/GetAggregate?operation='Avg'&resource='Result'&column='IntegratedDarkCount'&orderby='IntegratedDarkCount desc'&top=’50’&with=’TestCompletionDate >= “2013-01-23 12:00:00” and TestCompletionDate <= “2013-01-23 14:00:00” and ProcessPath = 1 and ProcessingLane = 1’
```

Note that the orderby parameter is used to sort the dark count from highest to lowest; and the top parameter is used to select the first 50 records. Note that the top parameter value is required to be enclosed in single-quotes (‘50’) even though it is numeric.

Note: The aggregate functions are provided for computation on a numerical field. All numerical fields specified in the Data Model are supported. Computation over non-numerical fields (date/time, string, etc.) yields undefined behavior.

5.2 ODR Version Information

The ODR provides a function to retrieve the currently installed ODR version information. The version information will change for each new ODR installed and does not necessarily mean the ODR database has changed.

Example: http://localhost:11000/ODR.svc/GetOdrVersion

6 Query Governors

The ODR employs query governors to regulate incoming requests. The following restrictions apply:

1. The ODR supports pagination for the response data. A maximum of 1000 records are returned at any one time. A client must use the link provided in the response to request the next page of data.
2. Only one consumer query will be processed at a time
3. The ODR may reject a query request if the system is deemed busy

7 Data Retention

The ODR consumer data are preserved for a period of time, after which the data will be purged from the system. The data retention policies can be specified by time, capacity, or relationship to other data.

1. Time: Specifies the length of time after which the data will be purged
2. Capacity: Specifies the number of records beyond which the oldest records are purged
3. Relationship: Specifies that the records are purged only if the related records are purged

Note: Default Retention Type = Day. Default Retention Unit = 7.

Data	Policy	Retention Type	Retention Unit	Comments
AssayActivity	Time	Day	1	Not aged with Result records.
AssayActivityCc	Time	Day	1	Not aged with Result records.
CalCurve	Time	Default	Default	
CalibrationResultCompletion	Time	Default	Default	
CcAspirationPM	Time	Day	1	Not aged with Result records.
CcBulkSolutionConsumedData	Time	Default	Default	
CcBulkSolutionMonitorData	Time	Default	Default	
CcCuvetteWashWaterVolumeData	Time	Default	Default	
CcDispensePM	Time	Day	1	Not aged with Result records.
CcLampMonitorData	Time	Default	Default	
CcOpticsAdjustTriggerSensorData	Time	Default	Default	
CcPhotoData	Time	Day	1	Not aged with Result records.
CcPipettorPMRawData	Time	Day	1	
CcReagentAspirationOtherData	Time	Day	1	
CcReagentAspirationPciData	Time	Day	1	
CcReagentCarouselCoolerTemperatureData	Time	Default	Default	
CcReagentCarouselTeknicMotorData	Time	Default	Default	
CcReagentDispenseOtherData	Time	Day	1	

CcReagentDispensePciData	Time	Day	1	
CcReagentWashOtherData	Time	Day	1	
CcReagentWashPciData	Time	Day	1	
CcSampleAspirationOtherData	Time	Day	1	
CcSampleAspirationPciData	Time	Day	1	
CcSampleDispenseOtherData	Time	Day	1	
CcSampleDispensePciData	Time	Day	1	
CcSampleWashOtherData	Time	Day	1	
CcSampleWashPciData	Time	Day	1	
CcWashPM	Time	Day	1	
CcWaterBathRefillData	Time	Default	Default	
ConstituentData	Time	Default	Default	
ExperimentProcessing	Time	Default	Default	
HeaterDutyCycleData	Time	Day	1	
IArm	Time	Day	1	Not aged with Result records.
IcbMotorMove	Time	Day	1	Not aged with Result records.
InductionHeaterRunProfileResponseData	Time	Day	1	Not aged with Result records.
InductionHeaterWaveformData	Time	Day	1	
InstrumentActivity	Time	Day	1	
InstrumentEvent	Time	Hour	4	Data not collected
ITVData	Time	Day	1	Not aged with Result records.
LLD	Time	Default	Default	
LLDCc	Time	Default	Default	
LLDNoiseData	Time	Default	Default	
LowLevelOperation	Time	Hour	4	Data not collected
MessageHistory	Time/Capacity	Records	10000	
MNDHistory	Time/Relationship	Default	Default	1. Records older than default retention type and unit are purged. 2. Related records from following tables are also purged: a. Scripting b. MNDRecordData
MNDRecordData	Relationship			Record is purged only when corresponding MNDHistory record is purged.
OpticsRawData	Time	Day	1	
PipettorSyringeBacklashData	Time	Day	1	
PMEvent	Time	Default	Default	
PMRawData	Time	Day	1	Not aged with Result records.

ReagentCoolerData	Time	Day	1	
ReagentOperation	Time	Day	1	Not aged with Result records.
Result	Time/Relationship	Default	Default	1. Records older than default retention type and unit are purged. 2. Related records from following tables are also purged: a. LLD b. LLDCc c. ConstituentData d. PMEvent 3. **Note** that tables that have a non-default aging policy are not aged as related records when Result records are aged.
Scripting	Relationship			Record is purged only when corresponding MNDHistory record is purged.
TeknicMotor	Time	Day	1	
TemperatureData	Time	Day	1	
VacuumPressureData	Time	Day	1	
WamBulkData	Time	Day	1	Not aged with Result records.
WamData	Time	Day	1	Not aged with Result records.

8 Data Not Collected

8.1 The following tables have data collection disabled by default:

LowLevelOperation
InstrumentEvent

9 References

9.1 Icb

Icb motor information is attached here: Icb Motor Information