

1. Introduction

This document provides a brief overview of the API being developed for the Intouch i4 MES software. It is not intended as a full technical specification or instructions for use, rather as a guideline to the endpoints that will be available and the data exchanges they will provide for.

The API will be a restful API requiring HTTPS.

Authentication will be via an access key which will be submitted in the header of each call. This API key may also be used for Authorisation.

All data will be JSON encoded and will therefore require conversion to/from the appropriate type at either end. All double value less than 1 must have a preceding zero (i.e. .7 will not be accepted, must be 0.7).

A throttling algorithm (TBD) will be used to limit the rate of calls.

2. Entities

The following are outlines of the data structures involved:

2.1 Machine

Field Name	Type	Comments
MachineID	String	GUID, automatically allocated by the Intouch system and used to uniquely identify each machine.
MachineName	String	Text fields which are used to display data in the Intouch system related to each machine. One of these fields could be used to store a reference to a machine entity in a 3 rd party system.
MachineDescription	String	
MachineText1	String	
MachineText2	String	
MachineText3	String	
MachineText4	String	
MachineText5	String	
Properties	List<Property>	
Active	Boolean	

2.2 Reject Code

Field Name	Type	Comments
ID	String	GUID, automatically allocated by the Intouch system and used to uniquely identify each reject code.
Name	String	Text fields which are used to display data in the Intouch system related to each reject code. One of these fields could be used to store a reference to a reject code entity in a 3 rd party system.
Description	String	
Details	String	
Text1	String	
Text2	String	
Properties	List<Property>	
Active	Boolean	

2.3 Stop Code

Field Name	Type	Comments
ID	String	GUID, automatically allocated by the Intouch system and used to uniquely identify each stop code.
Name	String	Text fields which are used to display data in the Intouch system related to each stop code. One of these fields could be used to store a reference to a stop code entity in a 3 rd party system.
Description	String	
Details	String	
Text1	String	
Text2	String	
Properties	List<Property>	
Active	Boolean	

2.4 Property

Field Name	Type	Comments
Name	String	GUID, automatically allocated by the Intouch system and used to uniquely identify each reject code.
Type	Integer	String = 0 Integer = 1 Double = 2 Boolean = 3 Date = 4
Value	String	

2.5 Job

Field Name	Type	Comments
JobID	String	GUID, automatically allocated by the Intouch system and used to uniquely identify a Job.
MachineID	String	
ToolCode	String	
EarliestStart	DateTime	
LatestFinish	DateTime	
StandardCycleTime	Double	Standard cycle time for the job in seconds.
SlowCycle	Double	Cycle time at which the Intouch system will show the machine as running slowly.
FastCycle	Double	Cycle time at which the Intouch system will show the machine as running fast.
VeryFastCycle	Double	Cycle time at which the Intouch system will show the machine as running very fast.
StoppedCycle	Double	Elapsed time since the last cycle for which the Intouch system will show the machine as stopped.
SetupTime	Integer	Planned setup time for the job, in seconds.
WorksOrders	List<WorksOrder>	

2.6 JobWithProcessParameters

Field Name	Type	Comments
JobID	String	GUID, automatically allocated by the Intouch system and used to uniquely identify a Job.
MachineID	String	
ToolCode	String	
EarliestStart	DateTime	
LatestFinish	DateTime	
StandardCycleTime	Double	Standard cycle time for the job in seconds.
SlowCycle	Double	Cycle time at which the Intouch system will show the machine as running slowly.
FastCycle	Double	Cycle time at which the Intouch system will show the machine as running fast.
VeryFastCycle	Double	Cycle time at which the Intouch system will show the machine as running very fast.
StoppedCycle	Double	Elapsed time since the last cycle for which the Intouch system will show the machine as stopped.
SetupTime	Integer	Planned setup time for the job, in seconds.
WorksOrders	List<WorksOrder>	
ProcessParameters	List<ProcessParameter>	

2.7 WorksOrder

Field Name	Type	Comments
WorskOrderID	String	GUID, automatically allocated by the Intouch system and used to uniquely identify each works order.
JobID	String	
OrderNumber	String	
PartCode	String	
OrderQuantity	Double	
AlreadyMade	Double	
Description	String	
ShortDescription	String	
LongDescription	String	
DueDate	DateTime	
Impressions	Double	
PartWeight	Double	
WasteWeight	Double	
SellingPrice	Double	
MaterialCost	Double	
Material	String	
Text[1-5]	String Array	
Number[1-9]	Integer Array	
AdditionalText[1-40]	String Array	
AdditionalNumber[1-15]	Double Array	

2.8 User

Field Name	Type	Comments
UserID	String	GUID, automatically allocated by the Intouch system and used to uniquely identify each user.
UserName	String	This field could be used as a reference to a user entity in a 3 rd party system.
FirstName	String	
LastName	String	
Email	String	
Properties	List<Property>	
Active	Boolean	

2.9 ProductionProfilePeriod

Field Name	Type	Comments
MachineID	String	
StartTime	DateTime	
EndTime	DateTime	
Status	Integer	No Job = 1 Waiting To Start Job = 2 Setup = 3 Running OK = 4 Running Fast = 5 Running Slow = 6 Stopped = 7 Running Very Fast = 8
StopCodeID	String	
JobID	String	
OperatorsLoggedIn	List<string>	One entry in the list for each operator logged into the given machine during the period. Each entry in the list points to the User GUID.
PartsMade	List< WorksOrderProduction >	

2.10 WorksOrderProduction

Field Name	Type	Comments
WorksOrderID	String	
GoodParts	Double	
Rejects	List<Reject>	

2.11 Reject

Field Name	Type	Comments
RejectCodeID	String	
Quantity	Double	

2.12 JobImport

Field Name	Type	Comments
Jobs	List<Job>	
Settings	List<ImportSetting>	

2.13 JobImportWithProcessParameters

Field Name	Type	Comments
Jobs	List<JobWithProcessParameter>	
Settings	List<ImportSetting>	

2.14 ImportSetting

Field Name	Type	Comments
Name	String	
Value	String	Set to '0' to deactivate the setting. Set to '1' to activate the setting.

Settings:

Setting Name	If Active
UpdateExistingJobs	If the job is already on the schedule, then update it with new values from the import.
AddEndedJobs	If the job has previously been imported and subsequently ended on Intouch, then add the job back into the schedule.
AddDeletedJobs	If the job has previously been imported and subsequently deleted from the schedule, then add the job back into the schedule.
MoveFixedJobs	Allow the import to move jobs that have been marked as fixed on the schedule.
AddToUnscheduled	Adds any new jobs in the file to the unscheduled machine.
MoveOldJobs	Allows existing jobs to be re-sequenced by the import.
MoveMachines	Allows existing jobs to be move to a different machine if specified in the import.
DeleteOldJobs	The import will delete jobs that are on the schedule but not in the import.

2.15 ScheduleImportReport

Field Name	Type	Comments
TimeStamp	String	
NumberOfLinesInTheImport	Integer	
SuccessfullyImported	List<JobImportReport>	
Warnings	List<JobImportReport>	
Errors	List<JobImportReport>	

2.16 JobImportReport

Field Name	Type	Comments
ImportLineNumber	Integer	
Items	List<JobImportReportLine>	

2.17 JobImportReportLine

Field Name	Type	Comments
StatusType	String	Success Warning Error
StatusCode	Integer	<u>Success Codes</u> 1001 Job added. 1002 Job updated. <u>Warning Codes</u> 2001 Not imported – Job previously ended. 2002 Not imported – Job previously deleted. 2003 Not imported – Job previously imported. 2004 Job deleted. <u>Error Codes</u> 3001 Not imported – Invalid machine. 3002 Not imported – Invalid data.
StatusMessage	String	
Description	String	
AdditionalDetails	List< String >	This field will give additional details where available such as why the job failed data validation. There may be more than one reason a job is rejected. For successfully added jobs this will contain the Job ID GUID for the new job.

2.18 Trigger

Field Name	Type	Comments
TriggerID	String	GUID, automatically allocated by the Intouch system and used to uniquely identify each .
TimeStamp	DateTime	
EventType	String	JobStart JobEnd PalletComplete MachineStopped MachineStarted
MachineID	String	
Parameter1	String	
Parameter2	String	
Parameter3	String	
Parameter4	String	
Parameter5	String	

2.18.1 Job Start

For Job Start trigger events the Parameter1 property will be set to the Job ID of the job being started.

2.18.2 Job End

For Job End trigger events the Parameter1 property will be set to the Job ID of the job being ended .

2.18.3 Pallet Complete

For Pallet Complete trigger events the Parameter1 property will be set to the Job ID of the job currently running on the machine in question. Parameter2 will be set to the Workorder ID of the works order for which the pallet is completed. Parameter 3 will be set to the pallet start time.

2.19 Process Parameter

Field Name	Type	Comments
ParameterName	String	
NominalValue	Double	
USL	Double	
LSL	Double	
UAL	Double	
LAL	Double	

3. Endpoints

3.1 Machines

GET All Machines
Returns all Machine entities.

GET Machine {ID}
Get Machine entities by ID.

3.2 Reject Codes

GET All Reject Codes
Returns all Reject Code entities.

3.3 Stop Codes

GET All Stop Codes
Returns all Stop Code entities.

3.4 Users

GET All Users
Returns all Machine entities.

GET User {ID}
Get User entities by ID.

3.5 Jobs

GET Job {ID}
Returns Job entity by Job ID

POST List<Job>, List<Options (string, string)>
Update job schedule on Intouch.
Returns exception report detailing any jobs which could not be added to schedule and why.

3.6 Production Data

GET Production Profile {start time, end time, MachineID}
Returns list of contiguous production profile periods describing the production between the start and end times for the specified machine.



4. Triggers

Initially it will be possible to subscribe to the following triggers.

Trigger	Parameters included in trigger
Start of job	Trigger ID, Time stamp, machine ID, Job ID
End of job	Trigger ID, Time stamp, machine ID, Job ID, Current Pallet Start Time
Suspend job	Trigger ID, Time stamp, machine ID, Job ID, Current Pallet Start Time
End of Pallet	Trigger ID, Time stamp, machine ID, Job ID, Works Order ID, Pallet Start Time, Pallet Quantity
Machine Stopped	Trigger ID, Time stamp, machine ID, Stop Code
Machine Started	Trigger ID, Time stamp, machine ID

Trigger subscription will initially be configured by Intouch. Ultimately this will be configurable by the customer through a web page.

Each trigger occurrence will include a unique Trigger ID. Any triggers posted will require a response. If a response is not received the trigger will be repeated (with the same Trigger ID) until a response is received or until the max number of tries (TBD) is reached. The Trigger ID will enable the endpoint to verify that the trigger has not be seen before.

The triggers we send are HTTP POST requests made to the URL you provide, with a JSON body.

The JSON body will be in the following format:

```
{
  "Id":"9C7EFB0A-CF9C-4534-AC86-BEC7AFE2ED47", // Trigger Id
  "TimeStamp":"2020-01-01T00:00:00.000Z",
  "EventType":"JobStart",
  "MachineId":"123-123-123-123",
  "Parameter1":"8B7AFB0A-EF9A-8346-AC86-EBD7AAF2ED21",
  "Parameter2":"","
  "Parameter3":"","
  "Parameter4":"","
  "Parameter5":""
}
```

You should return a http response code 200 (Ok).

5. Operation

The following is a brief description of how the API might be used to send works orders to Intouch and subsequently retrieve production data when those works orders are run and monitored by Intouch.

1. Use the Machine end point to get a list of the machines defined within Intouch. Each machine will include an ID which is unique and is the ID Intouch will use to identify the machine in any API data exchanges. It will also include other data such as machine name, description, and text fields. One of these fields would need to have been configured in the Intouch system to match a reference to the correct machine in the customers system.
2. Use the Users end point to get a list of the users defined within Intouch. Each user will include an ID which is unique and is the ID Intouch will use to identify the user in any API data exchanges. It will also include other data such as username, and text fields. One of these fields would need to have been configured in the Intouch system to match a reference to the correct user in the customers system.
3. Use the Stop Codes end point to get a list of the stop codes defined within Intouch. Each stop code will include an ID which is unique and is the ID Intouch will use to identify the stop code in any API data exchanges. It will also include other data such as stop code name, and text fields. One of these fields would need to have been configured in the Intouch system to match a reference to the correct stop code in the customers system.
4. Use the Reject Codes end point to get a list of the reject codes defined within Intouch. Each reject code will include an ID which is unique and is the ID Intouch will use to identify the reject code in any API data exchanges. It will also include other data such as reject code name, and text fields. One of these fields would need to have been configured in the Intouch system to match a reference to the correct reject code in the customers system.
5. Use the Jobs endpoint to send a list of jobs/workorders to the Intouch schedule.
6. Intouch will then be used to monitor production against those jobs.
7. As production against a job progresses Intouch will send triggers at the start of a job and at the end of each pallet.
8. When a pallet trigger is received, use the Production Data end point to retrieve the production data for the machine for the period during which the pallet was made.
9. At the end of a job Intouch will send an End Job trigger.