

VTouch: vSend Raw Data Packet Format

| Revision | Date | Revised by | Description of change |
|----------|------------|------------|--|
| 1.0 | 11/10/2015 | JLU | Initial revision |
| 1.1 | 11/16/2015 | JLU | Added more details to description of Packet's Data Section |
| 1.2 | 3/4/2016 | JLU | Added information on configuring vSend and Communications format |
| 1.3 | 8/21/2019 | JLU | Added section 2.8 which indicates that the receiver of the VSend packet must send an OK response |

1.0 Scope

This document describes the format of the vSend packets transmitted by VTouch. The VTouch Server transmits vSend packets to the 3rd party enterprise server for each controller configured for vSend in the VTouch Controller Admin panel. The screenshot below shows an example Controller Admin panel for a Webmaster controller.

Controller Admin

Serial Number: 1102159999

Model: WMT.233

VSend on Alarms: ☐

VSend on Any Data: ☒

VSend URL: http://2.esi-liveconnect.com:8082/vsend/raw_data.php

VSend Aggregate: ☐

VSend Aggregate URL:

Enable GPS: ☐

Enable Web Cam: ☐

Enable Text-To-Voice: ☐

Display Byte Count: ☐

Display Live Connect: ☒

Display Visual Summary: ☐

Allow Data Log: ☐

Allow Alarm Emails: ☐

Master Account: WALCHEM ENG'G

Action:

<< Back Edit Delete

In this example, whenever VTouch receives a data packet from the Webmaster, it will build a vSend packet and send it to the 3rd party enterprise server. The vSend packets are in the form of an HTML POST and a separate packet will be sent for each controller configured for vSend.

The controller itself knows nothing about vSend. It is strictly a VTouch feature.

2.0 vSend Packet Format

vSend packets contain multiple sections that are separated by an ‘&’ character. Data within each section is separated by special delimiter characters. These can be colons, comma, carets, vertical line characters, etc.

Other than the ‘&’ character, all other delimiters are stored in the vSend packet as hexadecimal ASCII codes using the format *%xx*. For example, the colon has a hexadecimal ASCII value of 3A, so it would appear in a vSend packet as *%3a*.

Other delimiters are:

| Character | Hexadecimal value |
|-----------------|-------------------|
| , (comma) | %2c |
| / (slash) | %2f |
| ^ (caret) | %5e |
| (vertical line) | %7c |

Packets are sent as one long string without spaces, so if a space is needed, it is replaced by a ‘+’ character. For example, the name *Flowmeter rate* would appear in the packet as *Flowmeter+rate*.

Each vSend packet contains the following sections:

- Company - VTouch Master Account that the device belongs to
- Date – Date that the device’s data packet was sent to VTouch
- Time – Time that the device’s data packet was sent to VTouch
- Device - Serial Number of the device
- Data – Delimited list of data
- Problem – Delimited list of alarm strings

Each section begins with a marker and each section is separated by an ‘&’ character.

2.1 Company Section

The Company section contains the VTouch Master Account that the device belongs to. The section begins with a “**Company=**” marker followed by the VTouch Master Account name.

The Company section for a device that belongs to the *WALCHEM ENG’G* VTouch Master Account would be written to the vSend packet as follows:

Company=WALCHEM+ENG’G

Note that the space is replaced by a ‘+’ character.

2.2 Date Section

The Date section contains the date that the device sent the data packet to the VTouch server. The section begins with a “**Date=**” marker followed by the date.

The Date section for a data packet sent on 11/10/2015 would be written to the vSend packet as follows:

Date=11%2f10%2f2015

Note that the ‘/’ character in the date is replaced by its hexadecimal ASCII representation **%2f**.

2.3 Time Section

The Time section contains the date that the device sent the data packet to the VTouch server. The section begins with a “**Time=**” marker followed by the time.

The Time section for a data packet sent on 18:44:46 would be written to the vSend packet as follows:

Time=18%3a44%3a46

Note that the ‘:’ character in the date is replaced by its hexadecimal ASCII representation **%3a**.

2.4 Device Section

The Device section contains the Serial Number of the device. The section begins with a “**Device=**” marker followed by the time.

The Device section for a device with a serial number of 1102159999 would be written to the vSend packet as follows:

Device=1102159999

2.5 Data Section

The Data section contains the data from in the data packet that was sent to the VTouch server. The section begins with a “**Data=**” marker followed by the data.

The data section contains a number of I/O data points (e.g. Sensor, Analog Input, Digital Input, etc.) separated by a comma. Each I/O data point consists of four items, separated by a colon:

- Hardware name
- Custom name
- Units
- Data Value

For example, **Sensor1 (S_1):Cond:uS:3452.25,Flowmeter(AI_3):Makeup Flow:gal:4530**

If a particular item is not defined (e.g. no custom name or no units specified), there will be two colons side by side or with a single space between them.

For example, **Interlock Status (DI_E):FlowSwitchE::ClosedE**,

2.5.1 Hardware Name

The Hardware Name consists of the hardware type and the hardware channel. The format may be different based upon the product.

For example, the hardware name for Sensor 1 on a WebMaster is **Sensor1 (S_1)**, while the hardware name for Sensor 1 on a W600 is **Sensor (S11)**.

2.5.2 Custom Name

The Custom Name is the user-editable name for the hardware channel. For example, if Sensor 1 is a CCond sensor, the custom name might be **CCond**. A Flowmeter could have the custom name **Makeup Flow**.

2.5.3 Units

The Units specifies the units used for the data point. These can be pre-defined standard units (e.g. uS, mA, gal, gal/min, %, etc.) or user-editable units that users define themselves.

If the units contain special characters (e.g. '/' in gal/min or '%'), the special characters are written to the vSend packet in hexadecimal ASCII format. For example, gal/min is written as **gal%2fmin** and '%' is written as **%25**.

2.5.4 Data Value

The current data value for the hardware type is the last part of the data point record. The format of the data value will vary depending upon the data point hardware type.

Numeric values (e.g. Sensors, Flowmeters, Analog Outputs, Counters, Totals, etc.) will contain zero, one or two decimal places.

For example: **Sensor1 (S_1):CCond:uS:2070.02**

On the WebMaster, Generic Digital Inputs show an ON/OFF status, followed by a vertical line delimiter, followed by the time in that state. The units field for the this hardware type will be blank

For example: **Generic (DI_3):Tower Status::ON | 3 days,22:24:22**

Interlocks, or DI State inputs on the W600, display a user-editable custom name for the state (Open, Closed, Flow, No Flow, etc.).

For example: **Interlock Status (DI_E):FlowSwitchE::ClosedE**

2.5.5 Complete Data Section

When the data is written to the vSend packet, the delimiters and special characters are converted to their hexadecimal ASCII representation.

A WebMaster VTouch data packet with the following data:

**Sensor1 (S_1):CCond:uS:2070.02,
Sensor1 (S_1) Min:CCond:uS:2064.23,
Sensor1 (S_1) Max:CCond:uS:2071.39,
Sensor1 (S_1) Avg:CCond:uS:2067.56,
Sensor Temperature1 (S_1):CCond:F:79.02,
Sensor2 (S_2):ORP:ppm:0.00,
Sensor3 (S_3):pH:pH:6.88,
Sensor3 (S_3) Min:pH:pH:6.88,
Sensor3 (S_3) Max:pH:pH:6.90,
Sensor3 (S_3) Avg:pH:pH:6.89,
Sensor4 (S_4):ORP:mV:-779.59,
FlowMeter Total (AI_1):Makeup Flow:gal:536887104.00,
FlowMeter Rate (AI_1):Makeup Flow:gal/min:739.10,
FlowMeter Total (AI_2):Blowdown Flow:gal:268436480.00,
Generic (AI_3):Corrosion:mpy:19.96,
Generic (AI_4):Fouling:Units:24.78,
Generic (AI_4) Min:Fouling:Units:24.64,
Generic (AI_4) Max:Fouling:Units:25.02,
Generic (AI_4) Avg:Fouling:Units:24.80,
AO_1:CCond Output:%:53.50,
AO_2:Prop ORP:mA:4.00,
AO_3:pH Out:mA:11.87,
Generic (DI_3):Tower Status::ON | 3 days,22:24:22,
FlowMeter Total (DI_A):Makeup CH:gal.:1505.00,
FlowMeter Total (DI_C):PaddleC:gal.:0.00,
FlowMeter Rate (DI_C):PaddleC:gal./min.(GPM):0.00,
Generic Counter Total (DI_D):Counter:Units:0.00,
Generic Counter Rate (DI_D):Counter:Units/Second:0.00,
Interlock Status (DI_E):FlowSwitchE::ClosedE,
Interlock Status (DI_F):FlowSwitchF::ClosedF,
LSI:LSI: :2.19,
RSI:RSI: :4.11**

would be written to the vSend packet as follows:

&Data=Sensor1+(S_1)%3aCCCond%3auS%3a2070.02%2cSensor1+(S_1)+Min%3aCCCond%3auS%3a2064.23%2cSensor1+(S_1)+Max%3aCCCond%3auS%3a2071.39%2cSensor1+(S_1)+Avg%3aCCCond%3auS%3a2067.56%2cSensor+Temperature1+(S_1)%3aCCCond%3aF%3a79.02%2cSensor2+(S_2)%3aORP%3appm%3a0.00%2cSensor3+(S_3)%3apH%3apH%3a6.88%2cSensor3+(S_3)+Min%3apH%3apH%3a6.88%2cSensor3+(S_3)+Max%3apH%3apH%3a6.90%2cSensor3+(S_3)+Avg%3apH%3apH%3a6.89%2cSensor4+(S_4)%3aORP%3amV%3a-779.59%2cFlowMeter+Total+(AI_1)%3aMakeup+Flow%3agal%3a536887104.00%2cFlowMeter+Rate+(AI_1)%3aMakeup+Flow%3agal%2fmin%3a739.10%2cFlowMeter+Total+(AI_2)%3aBlowdown+Flow%3agal%3a268436480.00%2cGeneric+(AI_3)%3aCorrosion%3ampy%3a19.96%2cGeneric+(AI_4)%3aFouling%3aUnits%3a24.78%2cGeneric+(AI_4)+Min%3aFouling%3aUnits%3a24.64%2cGeneric+(AI_4)+Max%3aFouling%3aUnits%3a25.02%2cGeneric+(AI_4)+Avg%3aFouling%3aUnits%3a24.80%2cAO_1%3aCCCond+Output%3a%25%3a53.50%2cAO_2%3aProp+ORP%3amA%3a4.00%2cAO_3%3apH+Out%3amA%3a11.87%2cGeneric+(DI_3)%3aTower+Status%3a%3aON+%7c++3+days%2c22%3a24%3a22%2cFlowMeter+Total+(DI_A)%3aMakeup+CH%3agal.%3a1505.00%2cFlowMeter+Total+(DI_C)%3aPaddleC%3agal.%3a0.00%2cFlowMeter+Rate+(DI_C)%3aPaddleC%3agal.%2fmin.(GPM)%3a0.00%2cGeneric+Counter+Total+(DI_D)%3aCounter%3aUnits%3a0.00%2cGeneric+Counter+Rate+(DI_D)%3aCounter%3aUnits%2fSecond%3a0.00%2cInterlock+Status+(DI_E)%3aFlowSwitchE%3a%3aClosedE%2cInterlock+Status+(DI_F)%3aFlowSwitchF%3a%3aClosedF%2cLSI%3aLSI%3a+%3a2.19%2cRSI%3aRSI%3a+%3a4.11

Note that the delimiters and special characters have been replaced by their hexadecimal ASCII representations.

2.6 Problem Section

The Problem section specifies a list of alarms in the data packet sent to VTouch by the device. Each alarm string is separated by the hexadecimal ASCII representation for a caret ('^') character, %5e. The section begins with a “**Problem=**” marker followed by the set of alarm strings.

If a WebMaster sent a data packet to VTouch with the following alarms:

CCCond (S1)High Alarm
CCCond (S1)High High Alarm
ORP (S4)High Alarm
Corrosion (AI_3)High Alarm
Corrosion (AI_3)High High Alarm
Fouling (AI_4)High Alarm
Inhibitor (AI_5)Low Alarm
Bleach (DI_2)Pump Failure
FlowSwitchF (DI_F)Interlock Alarm

the Problem section would be written to the vSend packet as follows:

Problem=CCond+(S1)High+Alarm%5eCCond+(S1)High+High+Alarm%5eORP+(S4)High+Alarm%5eCorrosion+(AI_3)High+Alarm%5eCorrosion+(AI_3)High+High+Alarm%5eFouling+(AI_4)High+Alarm%5eInhibitor+(AI_5)Low+Alarm%5eBleach+(DI_2)Pump+Failure%5eFlowSwitchF+(DI_F)Interlock+Alarm

Note the %5e delimiter between alarms and that spaces have been replaced by a '+' character.

Also, be aware that when the WebMaster sends data packets to VTouch, it does not insert a space between the right parenthesis after the hardware channel and the alarm name -- e.g. **(DI_2)Pump Failure**.

The W600 product does put a space between the right parenthesis and the alarm name, so it would send an alarm string such as the following in a data packet to VTouch: **CCond (S11) Low Alarm** and this would appear in the vSend packet as **CCond+(S11)+Low+Alarm**.

2.7 Putting It All Together

Below is an example of a complete WebMaster vSend packet in raw format, using the examples from the previous sections:

Company=WALCHEM+ENG'G&Date=11%2f10%2f2015&Time=18%3a44%3a46&Device=1102159999&Data=Sensor1+(S_1)%3aCCond%3auS%3a2070.02%2cSensor1+(S_1)+Min%3aCCond%3auS%3a2064.23%2cSensor1+(S_1)+Max%3aCCond%3auS%3a2071.39%2cSensor1+(S_1)+Avg%3aCCond%3auS%3a2067.56%2cSensor+Temperature1+(S_1)%3aCCond%3aF%3a79.02%2cSensor2+(S_2)%3aORP%3appm%3a0.00%2cSensor3+(S_3)%3apH%3apH%3a6.88%2cSensor3+(S_3)+Min%3apH%3apH%3a6.88%2cSensor3+(S_3)+Max%3apH%3apH%3a6.90%2cSensor3+(S_3)+Avg%3apH%3apH%3a6.89%2cSensor4+(S_4)%3aORP%3amV%3a-779.59%2cFlowMeter+Total+(AI_1)%3aMakeup+Flow%3agal%3a536887104.00%2cFlowMeter+Rate+(AI_1)%3aMakeup+Flow%3agal%2fmin%3a739.10%2cFlowMeter+Total+(AI_2)%3aBlowdown+Flow%3agal%3a268436480.00%2cGeneric+(AI_3)%3aCorrosion%3ampy%3a19.96%2cGeneric+(AI_4)%3aFouling%3aUnits%3a24.78%2cGeneric+(AI_4)+Min%3aFouling%3aUnits%3a24.64%2cGeneric+(AI_4)+Max%3aFouling%3aUnits%3a25.02%2cGeneric+(AI_4)+Avg%3aFouling%3aUnits%3a24.80%2cAO_1%3aCCond+Output%3a%25%3a53.50%2cAO_2%3aProp+ORP%3amA%3a4.00%2cAO_3%3apH+Out%3amA%3a11.87%2cGeneric+(DI_3)%3aTower+Status%3a%3aON+%7c++3+days%2c22%3a24%3a22%2cFlowMeter+Total+(DI_A)%3aMakeup+CH%3agal.%3a1505.00%2cFlowMeter+Total+(DI_C)%3aPaddleC%3agal.%3a0.00%2cFlowMeter+Rate+(DI_C)%3aPaddleC%3agal.%2fmin.(GPM)%3a0.00%2cGeneric+Counter+Total+(DI_D)%3aCounter%3aUnits%3a0.00%2cGeneric+Counter+Rate+(DI_D)%3aCounter%3aUnits%2fSecond%3a0.00%2cInterlock+Status+(DI_E)%3aFlowSwitchE%3a%3aClosedE%2cInterlock+Status+(DI_F)%3aFlowSwitchF%3a%3aClosedF%2cLSI%3aLSI%3a+%3a2.19%2cRSI%3aRSI%3a+%3a4.11 &**Problem=CCond+(S1)High+Alarm%5eCCond+(S1)High+High+Alarm%5eORP+(S4)High+Alarm%5eCorrosion+(AI_3)High+Alarm%5eCorrosion+(AI_3)High+High+Alarm%5eFouling+(AI_4)High+Alarm%5eInhibitor+(AI_5)Low+Alarm%5eBleach+(DI_2)Pump+Failure%5eFlowSwitchF+(DI_F)Interlock+Alarm**

2.8 Confirmation of Packet Reception

Upon reception of the VSend packet, the receiver must send back “OK” to confirm that the packet was received successfully. Failure to do so will result in the Controller re-sending the same packet every time a new reading is received until an “OK” is received.