

Technical Note

DNP3 Timestamping Events

1. Introduction

1.1 Source Time-of-Occurrence Used for Timestamping

A DNP outstation can be configured to return the time-of-occurrence for events to allow proper sequencing of events. Each event is timestamped by the outstation with the time-of-occurrence the event transpired.

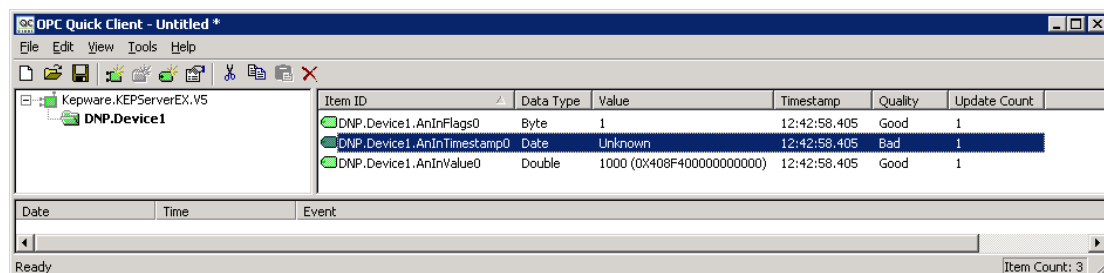
When the outstation returns the event with the time-of-occurrence, this value is used by the DNP master for the OPC timestamp for all sub-types for that point and for the value for the .Timestamp tag.

2. OPC DA and Time-of-Occurrence

2.1 OPC Timestamp and .Timestamp Tag

Each event updated to the client has the time-of-occurrence, provided by the outstation, displayed in the OPC timestamp and the value of the .Timestamp tag.

Until the first event is received from the outstation that includes the time-of-occurrence, the .Timestamp tag reports bad quality and the OPC timestamp for all sub-types is the OPC server timestamp.



Item ID	Data Type	Value	Timestamp	Quality	Update Count
DNP.Device1.AnInFlags0	Byte	1	12:42:58.405	Good	1
DNP.Device1.AnInTimestamp0	Date	Unknown	12:42:58.405	Bad	1
DNP.Device1.AnInValue0	Double	1000 (0X408F400000000000)	12:42:58.405	Good	1

2.2 Displaying of the Time and Date

The value for the .Timestamp tag has the added benefit of including the date for the time-of-occurrence.

The OPC server adjusts the time-of-occurrence to be the local time of the OPC server for the OPC timestamp.

The value of the .Timestamp tag is the UTC time-of-occurrence.

Item ID	Data Type	Value	Timestamp	Quality	Update Count
DNP.Device1.AnInFlags0	Byte	1	12:11:27.861	Good	1
DNP.Device1.AnInTimestamp0	Date	2015-06-26T16:11:27.861	12:11:27.861	Good	1
DNP.Device1.AnInValue0	Double	1000 (0x408F400000000000)	12:11:27.861	Good	1

3. OPC UA Time-of-Occurrence and Server Time

When using an OPC UA connection, the client can obtain the outstation time-of-occurrence as well as the server time.

Attribute	Value
NodeId	NodeId
NamespaceIndex	2
IdentifierType	String
Identifier	DNP3 Ethernet.slave4.AnInValue0
NodeClass	Variable
BrowseName	2, "AnInValue0"
DisplayName	"en", "AnInValue0"
Description	"en", ""
WriteMask	0
UserWriteMask	0
Value	
SourceTimestamp	6/30/2015 12:14:12.632 PM
SourcePicoseconds	0
ServerTimestamp	6/30/2015 12:19:55.470 PM
ServerPicoseconds	0
StatusCode	Good (0x00000000)
Value	999
DataType	Double
NamespaceIndex	0
IdentifierType	Numeric
Identifier	11
ValueRank	-1
ArrayDimensions	BadAttributeIdInvalid (0x80350000)
AccessLevel	Readable
UserAccessLevel	Readable
MinimumSamplingInterval	10
Historizing	false