

Test report

on the conformance of the tested functionality of BACnet implementations according to ANSI/ASHRAE 135-2001

No. 04.61.SAG.001.1

Initial test

This PDF document is verbatim to the original report and was issued on 13 May 2004.

This report consists of 23 pages

This report shall not be reproduced except in full without the written approval of the test laboratory.

Contents

1. Test Laboratory and location of test items	3
2. Applicant / Vendor	3
3. Description of the IUT	3
4. Test specification	3
5. Test attendants	3
6. Test dates	3
7. BIBBS	4
8. BACnet Standard Services	6
9. BACnet Standard Object Types	7
10. Results of the EPICS Consistency Test	8
11. Test result	8
12. Detailed test results	9
13. Remarks to the test execution	12
14. Remarks to the test result	12
Annex A: Electronic Protocol Implementation Conformance Statement (EPICS)	13

1. **Test Laboratory and location of test items**

WSPLab
Dr.-Ing. Harald Bitter
Kapuzinerweg 7
D-70374 Stuttgart

Telefon: (0711) 953922-0
Telefax: (0711) 953922-66

Test laboratory recognized by DIN CERTCO and RAL / WSPCert
accredited according to EN ISO/ IEC 17025
2. **Applicant / Vendor**

Fr. Sauter AG
Im Surinam 55
CH-4016 Basel
3. **Description of the IUT**
 - 3.1 **Product name**

BACnet Server Sauter AS 3600
 - 3.2 **Product model number**

EYK 300 F001
 - 3.3 **Product description**

The BACnet-Server Sauter AS 3600 is a BACnet Server software component for Sauter DDC-controller with Client functionality for peer to peer communication with other BACnet-Server and with integrated BBMD functionality. The Server-implementation is based on Cimetrics BACstac V4.0 and runs on MS Windows CE.
 - 3.4 **Firmware Revision**

2.0-017
 - 3.5 **Application Software Version**

2.0-017 build on Apr 8 2004 12:18:38, BACstac(TM) 4.0
4. **Test specification**
 - 4.1 **Test standards**

ANSI/ASHRAE 135-2001 (ISO 16484-5)
ASHRAE 135.1-2003

BTL Test Plan, revised 16.03.2004
BTL Specified Tests, revised 16.03.2004
BTL Functionality Checklist, revised 16.03.2004

Additional WSPLab Test Specifications V 1.0
 - 4.2 **Test software**

Visual Test Shell VTS 3.4.4
BACnet OPC-Server 3.1, Cimetrics Inc.
BACnet Explorer 1.09.2002.1219, Cimetrics Inc.
BAS-o-matic 4.0 (Build 287), Cimetrics Inc.
Ethereal 0.9.1
Siemens BACnet Protocol Analyzer Rel 4.12.0, Siemens Building Technologies AG / Building Automation
GNU Hethereal 0.8.17
5. **Test attendants**
 - 5.1 **Applicant**

Friedbert Metzger, Hartmut Melchin
 - 5.2 **Test laboratory**

Thomas Kurowski
6. **Test dates**
 - 6.1 **Date of receipt of test items**

08.01.2004
 - 6.2 **Start of test**

08.01.2004
 - 6.3 **End of test**

15.04.2004

7. BIBBS

no.	BIBB	Description	Supported x: yes o: no	Tested x: yes o: no
1.	DS	Data Sharing		
1.1	DS-RP-A	Data Sharing-ReadProperty-A	x	o
1.2	DS-RP-B	Data Sharing-ReadProperty-B	x	x
1.3	DS-RPM-A	Data Sharing-ReadPropertyMultiple-A	o	o
1.4	DS-RPM-B	Data Sharing-ReadPropertyMultiple-B	o	o
1.5	DS-RPC-A	Data Sharing-ReadPropertyConditional-A	o	o
1.6	DS-RPC-B	Data Sharing-ReadPropertyConditional-B	o	o
1.7	DS-WP-A	Data Sharing-WriteProperty-A	x	o
1.8	DS-WP-B	Data Sharing-WriteProperty-B	x	x
1.9	DS-WPM-A	Data Sharing-WritePropertyMultiple-A	o	o
1.10	DS-WPM-B	Data Sharing-WritePropertyMultiple-B	x	o
1.11	DS-COV-A	Data Sharing-ChangeOfValue-A	x	o
1.12	DS-COV-B	Data Sharing-ChangeOfValue-B	x	x
1.13	DS-COVP-A	Data Sharing-COVP-A	o	o
1.14	DS-COVP-B	Data Sharing-COVP-B	o	o
1.15	DS-COVU-A	Data Sharing-ChangeOfValue-Unsolicited-A	x	o
1.16	DS-COVU-B	Data Sharing-ChangeOfValue-Unsolicited-B	x	o
2.	AE	Alarm and Event Management		
2.1	AE-N-A	Alarm and Event-Notification-A	o	o
2.2	AE-N-I-B	Alarm and Event-Notification Internal-B	x	o
2.3	AE-N-E-B	Alarm and Event-Notification External-B	o	o
2.4	AE-ACK-A	Alarm and Event-ACK-A	o	o
2.5	AE-ACK-B	Alarm and Event-ACK-B	x	o
2.6	AE-ASUM-A	Alarm and Event-Alarm Summary-A	o	o
2.7	AE-ASUM-B	Alarm and Event-Alarm Summary-B	x	o
2.8	AE-ESUM-A	Alarm and Event-Enrollment Summary-A	o	o
2.9	AE-ESUM-B	Alarm and Event-Enrollment Summary-B	o	o
2.10	AE-INFO-A	Alarm and Event-Information-A	o	o
2.11	AE-INFO-B	Alarm and Event-Information-B	o	o
2.12	AE-LS-A	Alarm and Event-LifeSafety-A	o	o
2.13	AE-LS-B	Alarm and Event-LifeSafety-B	o	o
3.	SCHED	Scheduling		
3.1	SCHED-A	Scheduling-A	o	o
3.2	SCHED-I-B	Scheduling-I-B	x	o
3.3	SCHED-E-B	Scheduling-E-B	o	o
4.	T	Trending		
4.1	T-VMT-A	Trending-Viewing and Modifying Trends-A	o	o
4.2	T-VMT-I-B	Trending-Viewing and Modifying Trends Internal-B	x	o
4.3	T-VMT-E-B	Trending-Viewing and Modifying Trends External-B	o	o
4.4	T-ATR-A	Trending-Automated Trend Retrieval-A	o	o

4.5	T-ATR-B	Trending-Automated Trend Retrieval-B	x	o
5.	DM/NM	Device and Network Management		
5.1	DM-DDB-A	Device Management-Dynamic Device Binding-A	o	o
5.2	DM-DDB-B	Device Management-Dynamic Device Binding-B	x	x
5.3	DM-DOB-A	Device Management-Dynamic Object Binding-A	o	o
5.4	DM-DOB-B	Device Management-Dynamic Object Binding-B	x	x
5.5	DM-DCC-A	Device Management-DeviceCommunicationControl-A	o	o
5.6	DM-DCC-B	Device Management-DeviceCommunicationControl-B	x	x
5.7	DM-PT-A	Device Management-Private Transfer-A	o	o
5.8	DM-PT-B	Device Management-Private Transfer-B	o	o
5.9	DM-TM-A	Device Management-Text Message-A	o	o
5.10	DM-TM-B	Device Management-Text Message-B	o	o
5.11	DM-TS-A	Device Management-TimeSynchronization-A	o	o
5.12	DM-TS-B	Device Management-TimeSynchronization-B	x	x
5.13	DM-UTC-A	Device Management-UTCTimeSynchronization-A	o	o
5.14	DM-UTC-B	Device Management-UTCTimeSynchronization-B	o	o
5.15	DM-RD-A	Device Management-ReinitializeDevice-A	o	o
5.16	DM-RD-B	Device Management-ReinitializeDevice-B	x	o
5.17	DM-BR-A	Device Management-Backup and Restore-A	o	o
5.18	DM-BR-B	Device Management-Backup and Restore-B	o	o
5.19	DM-R-A	Device Management-Restart-A	o	o
5.20	DM-R-B	Device Management-Restart-B	o	o
5.21	DM-LM-A	Device Management-List Manipulation-A	o	o
5.22	DM-LM-B	Device Management-List Manipulation-B	x	o
5.23	DM-OCD-A	Device Management-Object Creation and Deletion-A	o	o
5.24	DM-OCD-B	Device Management-Object Creation and Deletion-B	o	o
5.25	DM-VT-A	Device Management-Virtual Terminal-A	o	o
5.26	DM-VT-B	Device Management-Virtual Terminal-B	o	o
5.27	NM-CE-A	Network Management-Connection Establishment-A	o	o
5.28	NM-CE-B	Network Management-Connection Establishment-B	o	o
5.29	NM-RC-A	Network Management-Router Configuration-A	o	o
5.30	NM-RC-B	Network Management- Router Configuration -B	o	o

8. BACnet Standard Services

no.	BACnet Standard Service	Supported x: yes / o: no	
		Initiation	Execution
1	AcknowledgeAlarm	o	x
2	ConfirmedCOVNotification	x	x
3	UnconfirmedCOVNotification	x	x
4	ConfirmedEventNotification	x	o
5	UnconfirmedEventNotification	x	o
6	GetAlarmSummary	o	x
7	GetEnrollmentSummary	o	o
8	GetEventInformation	o	o
9	LifeSafetyOperation	o	o
10	SubscribeCOV	x	x
11	SubscribeCOVProperty	o	o
12	AtomicReadFile	o	o
13	AtomicWriteFile	o	o
14	AddListElement	o	x
15	RemoveListElement	o	x
16	CreateObject	o	o
17	DeleteObject	o	o
18	ReadProperty	x	x
19	ReadPropertyConditional	o	o
20	ReadPropertyMultiple	o	x
21	ReadRange	o	x
22	WriteProperty	x	x
23	WritePropertyMultiple	o	x
24	DeviceCommunicationControl	o	x
25	ConfirmedPrivateTransfer	o	o
26	UnconfirmedPrivateTransfer	o	o
27	ReinitializeDevice	o	x
28	ConfirmedTextMessage	o	o
29	UnconfirmedTextMessage	o	o
30	TimeSynchronization	o	x
31	UTCTimeSynchronization	o	o
32	Who-Has	o	x
33	I-Have	x	o
34	Who-Is	o	x
35	I-Am	x	o
36	VT-Open	o	o
37	VT-Close	o	o
38	VT-Data	o	o
39	RequestKey	o	o
40	Authenticate	o	o

9. BACnet Standard Object Types

no.	BACnet Standard Object Types	Supported x: yes o: no
1	Accumulator	o
2	Analog Input	x
3	Analog Output	x
4	Analog Value	x
5	Averaging	o
6	Binary Input	x
7	Binary Output	x
8	Binary Value	x
9	Calendar	x
10	Command	o
11	Device	x
12	Event Enrollment	o
13	File	o
14	Group	o
15	Life Safety Point	o
16	Life Safety Zone	o
17	Loop	x
18	Multi-state Input	x
19	Multi-state Output	x
20	Multi-state Value	x
21	Notification Class	x
22	Program	o
23	Pulse Converter	o
24	Schedule	x
25	Trend Log	x

10. Results of the EPICS Consistency Test

The Electronic Protocol Implementation Conformance Statement (EPICS) was tested against the requirements of the BACnet Test Standard ASHRAE 135.1-2003 and the consistency can be confirmed.

11. Test result

BIBB	Description of the BIBB	test result P: passed F: failed
DS	Data Sharing	
DS-RP-B	Data Sharing-ReadProperty-B	P
DS-WP-B	Data Sharing-WriteProperty-B	P
DS-COV-B	Data Sharing-ChangeOfValue-B	P
DM/NM	Device and Network Management	
DM-DDB-B	Device Management-Dynamic Device Binding-B	P
DM-DOB-B	Device Management-Dynamic Object Binding-B	P
DM-DCC-B	Device Management-DeviceCommunicationControl-B	P
DM-TS-B	Device Management-TimeSynchronization-B	P

All tests were performed according to the BACnet Test Standard ASHRAE 135.1-2003, the BTL Test Plan, revised on March 16, 2004, and the Additional WSP Lab Test Specifications V 1.0.

The tested functionality of the BACnet implementation described in the EPICS (Annex A to this report) is conform to the BACnet Standard ANSI/ASHRAE 135-2001.

Stuttgart, 13.05.2004

signed in the original report

Bitter

signed in the original report

Kurowski

Dr.-Ing. H. Bitter
Institute Director

Dipl.-Ing. (FH) T. Kurowski
Test Manager

12. Detailed test results

legend

- P positive result / test passed
The IUT (Implementation Under Test) meets all requirements.
- F negative result / test failed
The IUT does not meet the requirements.
- no result
The test could not be performed. The failure of the test can not be identified as an IUT failure.
- O: This optional test has not been executed.

Test no.	Description of Service Test	test reference	result P: passed F: failed -: no result O: not executed	remarks to test
1	ReadProperty Service Execution Tests (req. for DS-RP-B)			
1.1	Read Support for Properties in the Test Database	135.1 - 7.1	P	
1.2	Reading the Size of an Array	135.1 - 9.18.1.1	P	
1.3	Reading a Single Element of an Array	135.1 - 9.18.1.2	P	
1.4	Reading Non-Array Properties with an Array Index	BTL - 9.18.2.1	P	
1.5	Reading Array Properties with an Array Index that is Out of Range	135.1 - 9.18.2.2	P	
1.6	Reading an Unknown Object	135.1 - 9.18.2.3	P	
1.7	Reading an Unknown Property	135.1 - 9.18.2.4	P	
1.8	Reading Properties Based on Data Type	BTL - 9.18.1.X1	P	1
2	WriteProperty Service Execution Tests (req. for DS-WP-B)			
2.1	Write Support Test Procedure	135.1 - 7.2.2	P	
2.2	Writing a Non-Commandable Property With a Priority	135.1 - 9.22.1.3	P	
2.3	Writing with a Property Value Having the Wrong Datatype	BTL - 9.22.2.3	P	
2.4	Writing with a Property Value that is Out of Range	135.1 - 9.22.2.4	P	
2.5	Writing Non-Array Properties with an Array Index	135.1 - 9.22.2.1	P	
2.6	Writing a Single Element of an Array	135.1 - 9.22.1.1	P	
2.7	Writing Array Properties with an Array Index that is Out of Range	135.1 - 9.22.2.2	P	
2.8	Writing an Array Size	BTL - 9.22.1.X1	P	
2.9	Command Prioritization Test	135.1 - 7.3.1.3	P	
2.10	Writing a Commandable Property Without a Priority	135.1 - 9.22.1.2	P	
2.11	Writing to Properties Based on Data Type	BTL - 9.22.1.X2	P	2
3	SubscribeCOV Service Execution Tests (req. for DS-COV-B)			
3.1	Confirmed COV Notifications	WSP - 9.10.1.W1	P	
3.2	Unconfirmed COV Notifications	WSP - 9.10.1.W2	P	
3.3	Explicit Indefinite Lifetime COV Subscriptions	WSP - 9.10.1.W3	P	
3.4	Cancelling COV Subscriptions	WSP - 9.10.1.W4	P	
3.5	Cancelling Expired or Non-Existing Subscriptions	WSP - 9.10.1.W5	P	
3.6	Implied Indefinite Lifetime COV Subscriptions	WSP - 9.10.1.W6	P	

3.7	Finite Lifetime Subscriptions	WSP - 9.10.1.W7	P	
3.8	Updating Existing Subscriptions	WSP - 9.10.1.W8	P	
3.9	The Monitored Object Does Not Support COV Notification	135.1 - 9.10.2.1	P	
3.10	Ensuring 5 Concurrent COV Subscribers	BTL - 9.10.1.X1	P	
3.11	Ensuring Subscription Lifetimes Are Not Effected By Time Changes	BTL - 9.10.1.X2	P	3
3.12	Accepts 24 Hour Lifetimes	BTL - 9.10.1.X3	P	3
3.13	Active_COV_Subscriptions Test	BTL - 7.3.2.Y.X	P	
4	ConfirmedCOVNotification Service Initiation Tests (req. for DS-COV-B)			
4.1	Change of Value Notification from an Analog Input, Analog Output, and Analog Value Object Present_Value Property	135.1 - 8.2.1	P	6
4.2	Change of Value Notification from an Analog Input, Analog Output, and Analog Value Object Status_Flags Property	135.1 - 8.2.2	P	
4.3	Change of Value Notification from a Binary Input, Binary Output, and Binary Value Object Present_Value Property	135.1 - 8.2.3	P	6
4.4	Change of Value Notification from a Binary Input, Binary Output, and Binary Value Object Status_Flags Property	135.1 - 8.2.4	P	
4.5	Change of Value Notification from a Multi-state Input, Multi-state Output, Multi-state Value, Life Safety Point, and Life Safety Zone Object Present_Value Property	135.1 - 8.2.5	P	6
4.6	Change of Value Notification from a Multi-state Input, Multi-state Output, Multi-state Value, Life Safety Point, and Life SafetyZone Object Status_Flags Property	135.1 - 8.2.6	P	
4.7	Change of Value Notification from Loop Object Present_Value Property	135.1 - 8.2.7	P	
4.8	Change of Value Notification from a Loop Object Status_Flags Property	135.1 - 8.2.8	P	
5	UnconfirmedCOVNotification Service Initiation Tests (req. for DS-COV-B)			
5.1	Change of Value Notification from an Analog Input, Analog Output, and Analog Value Object Present_Value Property	135.1 - 8.3.1	P	6
5.2	Change of Value Notification from an Analog Input, Analog Output, and Analog Value Object Status_Flags Property	135.1 - 8.3.2	P	
5.3	Change of Value Notification from a Binary Input, Binary Output, and Binary Value Object Present_Value Property	135.1 - 8.3.3	P	6
5.4	Change of Value Notification from a Binary Input, Binary Output, and Binary Value Object Status_Flags Property	135.1 - 8.3.4	P	
5.5	Change of Value Notification from a Multi-state Input, Multi-state Output, Multi-state Value, Life Safety Point, and Life Safety Zone Object Present_Value Property	135.1 - 8.3.5	P	6
5.6	Change of Value Notification from a Multi-state Input, Multi-state Output, Multi-state Value, Life Safety Point, and Life SafetyZone Object Status_Flags Property	135.1 - 8.3.6	P	
5.7	Change of Value Notification from Loop Object Present_Value Property	135.1 - 8.3.7	P	
5.8	Change of Value Notification from a Loop Object Status_Flags Property	135.1 - 8.3.8	P	
6	Who-Is Service Execution Tests (req. for DM-DDB-B)			
6.1	Local Broadcast, General Inquiry	135.1 - 9.33.1.1	P	
6.2	Global Broadcast, General Inquiry	135.1 - 9.33.1.2	P	
6.3	Local Broadcast, Specific Device Inquiry with IUT Outside of the Device Range	135.1 - 9.33.1.3	P	
6.4	Local Broadcast, Specific Device Inquiry with IUT Device Instance Equal to Low Limit of Device Range	135.1 - 9.33.1.4	P	
6.5	Local Broadcast, Specific Device Inquiry with IUT Device Instance Equal to High Limit of Device Range	135.1 - 9.33.1.5	P	
6.6	Local Broadcast, Specific Device Inquiry with IUT Inside of the Device Range	135.1 - 9.33.1.6	P	
6.7	General Inquiry, Global Broadcast from a Remote Network	135.1 - 9.33.2.1	P	

6.8	General Inquiry, Remote Broadcast	135.1 - 9.33.2.2	P	
6.9	General Inquiry, Directed to a Remote Device	135.1 - 9.33.2.3	P	
7	I-Am Service Initiation Tests (req. for DM-DDB-B)	135.1 – 8.35	P	4
8	Who-Has Service Execution Tests (req. for DM-DOB-B)			
8.1	Object ID Version with no Device Range	135.1 - 9.32.1.1	P	
8.2	Object Name Version with no Device Range	135.1 - 9.32.1.2	P	
8.3	Object ID Version with IUT Inside of the Device Range	135.1 - 9.32.1.3	P	
8.4	Object ID Version with IUT Outside of the Device Range	135.1 - 9.32.1.4	P	
8.5	Object Name Version with IUT Inside of the Device Range	135.1 - 9.32.1.5	P	
8.6	Object Name Version with IUT Outside of the Device Range	135.1 - 9.32.1.6	P	
8.7	Object ID Version with IUT Device Instance Equal to the High Limit of the Device Range	135.1 - 9.32.1.7	P	
8.8	Object ID Version with IUT Device Instance Equal to the Low Limit of the Device Range	135.1 - 9.32.1.8	P	
8.9	Object Name Version with IUT Device Instance Equal to the High Limit of the Device Range	135.1 - 9.32.1.9	P	
8.10	Object Name Version with IUT Device Instance Equal to the Low Limit of the Device Range	135.1 - 9.32.1.10	P	
8.11	Object Name Version, Directed to a Specific MAC Address	135.1 - 9.32.1.11	P	
8.12	Object ID Version, Global Broadcast from a Remote Network	135.1 - 9.32.2.1	P	
8.13	Object ID Version, Remote Broadcast	135.1 - 9.32.2.2	P	
9	I-Have Service Initiation Tests (req. for DM-DOB-B)	135.1 - 8.33	P	5
10	TimeSynchronization Service Execution Tests (req. for DM-TS-B)			
10.1	Local Broadcast	WSP - 9.30.1.W1	P	
10.2	Directed to the IUT	WSP - 9.30.1.W2	P	
11	DeviceCommunicationControl Service Execution Test			
11.1	Indefinite Time Duration Restored by DeviceCommunicationControl	135.1 – 9.24.1.1	P	
11.2	Indefinite Time Duration Restored by ReinitializeDevice	135.1 – 9.24.1.2	P	
11.3	Finite Time Duration	135.1 – 9.24.1.3	P	
11.4	Finite Time Duration Restored by DeviceCommunicationControl	BTL – 9.24.1.X1	P	
11.5	Finite Time Duration Restored by ReinitializeDevice	135.1 – 9.24.1.5	P	
11.6	Invalid Password	135.1 – 9.24.2.1	P	
11.7	Missing Password	135.1 – 9.24.2.2	P	

13. Remarks to the test execution

1. Verification of the ability to execute ReadProperty service requests for properties of each of the supported base data types is covered by the Read Support tests in ASHRAE 135.1-2003 clause 7.1.
2. Verification of the ability to execute WriteProperty service requests to each writable base data type supported by the IUT is covered by the Write Support tests in ASHRAE 135.1-2003 clause 7.2.
3. As per BTL Specified Tests-DS-03.doc
4. Verification of the ability to initiate I-Am service requests is covered by the Who-Is service execution tests in ASHRAE 135.1-2003 clause 9.33.
5. Verification of the ability to initiate I-Have service requests is covered by the Who-Has service execution tests in ASHRAE 135.1-2003 clause 9.32.

14. Remarks to the test result

6. Changes of commandable Present-Values are reflected in 3 COV-Notifications conveying the actual, the initial and again the actual value without any negative consequences for the client.

Annex A: Electronic Protocol Implementation Conformance Statement (EPICS)

-- BACnet_ProtocolRevision_2_(2001b).ini

PICS 0

BACnet Protocol Implementation Conformance Statement

Vendor Name: "Fr. Sauter AG"

Product Name: "BACnet Server Sauter AS 3600"

Product Model Number: "EYK 300 F001"

Product Description: "The BACnet-Server Sauter AS 3600 is a BACnet Server software component for Sauter DDC-controller with Client functionality for peer to peer communication with other BACnet-Server and with integrated BBMD functionality.

The Server-implementation is based on Cimetrics BACstac V4.0 and runs on MS Windows CE."

BIBBs Supported:

```
{
  DS-RP-A
  DS-RP-B
  DS-RPM-B
  DS-WP-A
  DS-WP-B
  DS-WPM-B
  DS-COV-A
  DS-COV-B
  DS-COVU-A
  DS-COVU-B
  AE-N-I-B
  AE-ACK-B
  AE-ASUM-B
  SCHED-I-B
  T-VMT-I-B
  T-ATR-B
  DM-DDB-B
  DM-DOB-B
  DM-DCC-B
  DM-TS-B
  DM-RD-B
  DM-LM-B
}
```

BACnet Standard Application Services Supported:

```
{
  AcknowledgeAlarm           Execute
  ConfirmedCOVNotification   Initiate Execute
  ConfirmedEventNotification Initiate
  GetAlarmSummary           Execute
  SubscribeCOV              Initiate Execute
  AddListElement            Execute
  RemoveListElement         Execute
  ReadProperty              Initiate Execute
  ReadPropertyMultiple      Execute
  WriteProperty             Initiate Execute
}
```

```

WritePropertyMultiple           Execute
DeviceCommunicationControl      Execute
ReinitializeDevice              Execute
I-Am                            Initiate
I-Have                          Initiate
UnconfirmedCOVNotification      Initiate Execute
UnconfirmedEventNotification    Initiate
TimeSynchronization            Execute
Who-Has                         Execute
Who-Is                         Execute
ReadRange                       Execute
}

```

Standard Object Types Supported:

```

{
  Analog Input
  Analog Output
  Analog Value
  Binary Input
  Binary Output
  Binary Value
  Calendar
  Device
  Loop
  Multi-state Input
  Multi-state Output
  Notification Class
  Schedule
  Multi-state Value
  Trend Log
}

```

Data Link Layer Option:

```

{
  ISO 8802-3, 10BASET
  BACnet/IP, 'DIX' Ethernet
}

```

Character Sets Supported:

```

{
  ANSI X3.4
}

```

Special Functionality:

```

{
  Maximum APDU size in octets: 1476
  Segmented Requests Supported, window size: 16
  Segmented Responses Supported, window size: 16
  BACnet/IP BBMD
}

```

Default Property Value Restrictions:

```

{
  real: <minimum -3.402822e38; maximum -3.402822e38; resolution 0.01>
  double: <minimum -3.402822e38; maximum -3.402822e38; resolution 0.01>
  unsigned-integer: <minimum 0; maximum 4294967295>
  date: <minimum 01.01.1996; maximum 18.01.2038>
  character-string: <maximum length string 255>
}

```

```

list: <maximum length list 12>
}

Fail Times:
{
  Notification Fail Time: 5
  Internal Processing Fail Time: 5
  Schedule Evaluation Fail Time: 20
  Acknowledgement Fail Time: 3
}

List of Objects in test device:
{
  {
    object-identifier: (device, 80)
    object-name: "Sauter"
    object-type: device
    system-status: OPERATIONAL
    vendor-name: "Fr. Sauter AG"
    vendor-identifier: 80
    model-name: "EYK 300 F001"
    firmware-revision: "2.0-010"
    application-software-version: "2.0-017 build on Apr  8 2004 12:18:38,
BACstac(TM) 4.0"
    location: ""
    description: "EYK 300 F001"
    protocol-version: 1
    protocol-revision: 2
    protocol-conformance-class : 5
    protocol-services-supported:
{T,T,T,T,F,T,F,F,T,T,F,F,T,F,T,T,T,T,F,F,T,F,F,F,F,F,T,T,T,T,F,F,T,T,T,T,F,F,F,
F}
    protocol-object-types-supported:
{T,T,T,T,T,T,T,F,T,F,F,F,T,T,T,T,F,T,F,T,T,F,F}
    object-list:
    {
      (device,80),
      (notification-class,1),
      (notification-class,2),
      (notification-class,3),
      (notification-class,4),
      (notification-class,5),
      (schedule,0),
      (calendar,0),
      (multistate-input,1256),
      (analog-input,1000),
      (analog-input,1001),
      {Trend-log,1001},
      (analog-output,1020),
      (analog-output,1022),
      (binary-output,1032),
      (binary-output,1033),
      (multistate-output,1036),
      (binary-input,1052),
      (multistate-input,1053),
      (analog-value,1064),
      (binary-value,1065),
      (multistate-value,1066),
    }
  }
}

```

```

    (loop,1070),
    (analog-value,1071)
}
max-APDU-length-accepted: 1476
segmentation-supported: SEGMENTED-BOTH
max-segments-accepted: 32
local-time: ?
local-date: ?
utc-offset: 0
daylight-savings-status: FALSE
apdu-segment-timeout: 2000
apdu-timeout: 3000
number-of-APDU-retries: 3
device-address-binding: 2
database-revision: ?
active-cov-subscriptions: ?
}
{
  object-identifier: (analog-input, 1000)
  object-name: "AI00"
  object-type: Analog-Input
  present-value: ?
  description: "MFA00"
  device-type: "Ni 1000 sensor"
  status-flags: {T,F,F,F}
  event-state: LOW-LIMIT
  reliability: NO-FAULT-DETECTED
  out-of-service: FALSE W
  update-interval: 500
  units: DEGREES-CELSIUS
  resolution: 0.06
  cov-increment: 0.5 W <minimum 0.01; maximum 300; resolution 0.06>
  time-delay: 0
  notification-class: 1
  high-limit: 50 W <minimum -100; maximum 300; resolution 0.06>
  low-limit: 10 W <minimum -100; maximum 300; resolution 0.06>
  deadband: 0.5
  limit-enable: {T,T}
  event-enable: {T,F,T}
  acked-transitions: {F,F,F}
  notify-type: ALARM
  event-time-stamps: ?
}
{
  object-identifier: (analog-input, 1001)
  object-name: "AI01"
  object-type: Analog-Input
  present-value: ?
  description: "MFA01 Loop70"
  device-type: "Ni 1000 sensor"
  status-flags: {F,F,F,F}
  event-state: NORMAL
  reliability: NO-FAULT-DETECTED
  out-of-service: FALSE W
  update-interval: 500
  units: DEGREES-CELSIUS
  resolution: 0.06
  cov-increment: 0.5 W <minimum 0.01; maximum 300; resolution 0.06>
}

```

```

}
{
  object-identifier: (analog-output, 1020)
  object-name: "AO20"
  object-type: analog-output
  present-value: ? W <minimum 0; maximum 100; resolution 0.005>
  description: "Q20"
  device-type: "Analog out without feedback"
  status-flags: {F,F,F,F}
  event-state: NORMAL
  reliability: NO-FAULT-DETECTED
  out-of-service: FALSE W
  units: PERCENT
  min-pres-value: 0
  max-pres-value: 100
  resolution: 0.005
  priority-array:
{NULL, NULL, NULL, NULL, NULL, NULL, NULL, NULL, NULL, NULL, NULL, NULL, NULL, NULL, NULL, NULL}
  relinquish-default: 50
  cov-increment: 0.1 W <minimum 0.005; maximum 100; resolution 0.005>
}
{
  object-identifier: (analog-output, 1022)
  object-name: "AO22"
  object-type: analog-output
  present-value: ? W <minimum 0; maximum 100; resolution 0.005>
  description: "Q22 Loop70"
  device-type: "Analog out without feedback"
  status-flags: {T,F,F,F}
  event-state: LOW-LIMIT
  reliability: NO-FAULT-DETECTED
  out-of-service: F W
  units: PERCENT
  min-pres-value: 0
  max-pres-value: 100
  resolution: 0.005
  priority-array:
{NULL, NULL, NULL, NULL, NULL, NULL, NULL, NULL, NULL, NULL, NULL, NULL, NULL, NULL, NULL, NULL}
  relinquish-default: 0
  cov-increment: 0.1 W <minimum 0.005; maximum 100; resolution 0.005>
  time-delay: 0
  notification-class: 1
  high-limit: 80 W <minimum 0; maximum 100; resolution 0.005>
  low-limit: 20 W <minimum 0; maximum 100; resolution 0.005>
  deadband: 0.1
  limit-enable: {T,T}
  event-enable: {T,F,T}
  acked-transitions: {F,F,F}
  notify-type: ALARM
  event-time-stamps: ?
}
{
  object-identifier: (analog-value, 1064)
  object-name: "AV64"
  object-type: analog-value
  present-value: ? W <minimum 0; maximum 1; resolution 0.005>

```

```

description: "Q21"
status-flags: {F,F,F,F}
event-state: NORMAL
reliability: NO-FAULT-DETECTED
out-of-service: FALSE W
units: NO-UNITS
priority-array:
{NULL,NULL,NULL,NULL,NULL,NULL,NULL,NULL,NULL,NULL,NULL,NULL,NULL,NUL
L}
  relinquish-default: 0.5
  cov-increment: 0.01 W <minimum 0.005; maximum 1; resolution 0.005>
}
{
  object-identifier: (analog-value, 1071)
  object-name: "AV71"
  object-type: analog-value
  present-value: ? W <minimum -100; maximum 300; resolution 0.06>
  description: "Sollwert Loop70"
  status-flags: {F,F,F,F}
  event-state: NORMAL
  reliability: NO-FAULT-DETECTED
  out-of-service: FALSE W
  units: DEGREES-CELSIUS
  priority-array:
{NULL,NULL,NULL,NULL,NULL,NULL,NULL,NULL,NULL,NULL,NULL,NULL,NULL,NUL
L}
  relinquish-default: 20
  cov-increment: 0.1 W <minimum 0.01; maximum 300; resolution 0.06>
  time-delay: 0
  notification-class: 1
  high-limit: 28 W <minimum -100; maximum 300; resolution 0.06>
  low-limit: 16 W <minimum -100; maximum 300; resolution 0.06>
  deadband: 0.1
  limit-enable: {T,T}
  event-enable: {T,F,T}
  acked-transitions: {F,F,F}
  notify-type: ALARM
  event-time-stamps: ?
}
{
  object-identifier: (binary-input, 1052)
  object-name: "BI52"
  object-type: binary-input
  present-value: ?
  description: "I 52-31"
  device-type: "Alarm"
  status-flags: {T,F,F,F}
  event-state: OFFNORMAL
  reliability: NO-FAULT-DETECTED
  out-of-service: F W
  polarity: NORMAL
  inactive-text: "Alarm"
  active-text: "Normal"
  change-of-state-time: (?,?)
  change-of-state-count: ? W
  time-of-state-count-reset: (?,?)
  time-delay: 0
  notification-class: 2

```

```

alarm-value: INACTIVE
event-enable: {T,F,T}
acked-transitions: {F,F,F}
notify-type: ALARM
event-time-stamps: ?
}
{
object-identifier: (binary-output, 1032)
object-name: "BO32"
object-type: binary-output
present-value: ? W
description: "Q32I"
device-type: "Command with false feedback"
status-flags: {F,F,F,F}
event-state: NORMAL
reliability: NO-FAULT-DETECTED
out-of-service: FALSE W
polarity: NORMAL
inactive-text: "ST0"
active-text: "STI"
change-of-state-time: (?,?)
change-of-state-count: 0 W
time-of-state-count-reset: (?,?)
priority-array:
{NULL,NULL,NULL,NULL,NULL,NULL,NULL,NULL,NULL,NULL,NULL,NULL,NULL,NUL
L}
relinquish-default: INACTIVE
}
{
object-identifier: (binary-output, 1033)
object-name: "BO33"
object-type: binary-output
present-value: ? W
description: "Q33I"
device-type: "Command with false feedback"
status-flags: {F,F,F,F}
event-state: NORMAL
reliability: NO-FAULT-DETECTED
out-of-service: FALSE W
polarity: NORMAL
inactive-text: "ST0"
active-text: "STI"
change-of-state-time: (?,?)
change-of-state-count: 0 W
time-of-state-count-reset: (?,?)
priority-array:
{NULL,NULL,NULL,NULL,NULL,NULL,NULL,NULL,NULL,NULL,NULL,NULL,NULL,NUL
L}
relinquish-default: INACTIVE
}
{
object-identifier: (binary-value, 1065)
object-name: "BV65"
object-type: binary-value
present-value: ? W
description: "Q32I Aut"
status-flags: {F,F,F,F}
event-state: NORMAL

```



```

event-time-stamps: ?
}
{
  object-identifier: (multi-state-input, 1053)
  object-name: "MSI53"
  object-type: multi-state-input
  present-value: ?
  description: "I 53"
  device-type: "Binary feedback"
  status-flags: {F,F,F,F}
  event-state: NORMAL
  reliability: NO-FAULT-DETECTED
  out-of-service: FALSE W
  number-of-states: 7
  state-text: { "NU", "31", "29", "24", "25", "27", "26" }
}
{
  object-identifier: (multi-state-input, 1256)
  object-name: "BACnet-Zert"
  object-type: multi-state-input
  present-value: ?
  description: "BACnet-Zert"
  device-type: "EYL220"
  status-flags: {F,F,F,F}
  event-state: NORMAL
  reliability: NO-FAULT-DETECTED
  out-of-service: FALSE
  number-of-states: 2
  state-text: { "Offline", "Online" }
  time-delay: 0
  notification-class: 3
  alarm-values: (1)
  fault-values: ()
  event-enable: {T,F,T}
  acked-transitions: {F,F,F}
  notify-type: ALARM
  event-time-stamps: ?
}
{
  object-identifier: (multi-state-output, 1036)
  object-name: "MSO36"
  object-type: multi-state-output
  present-value: ? W
  description: "Q36I/II"
  device-type: "Command with false feedback"
  status-flags: {F,F,F,F}
  event-state: NORMAL
  reliability: NO-FAULT-DETECTED
  out-of-service: FALSE W
  number-of-states: 3
  state-text: {"ST0","STI","STII"}
  priority-array:
{NULL,NULL,NULL,NULL,NULL,NULL,NULL,NULL,NULL,NULL,NULL,NULL,NULL,NUL
L}
  relinquish-default: 1
}
{
  object-identifier: (multi-state-value, 1066)

```



```

object-type: notification-class
description: "Floating Limit Notification - class 5"
notification-class: 5
priority: { 1, 1, 1} W
ack-required: {F, F, F}
recipient-list: ? W
}
{
  object-identifier: (schedule, 0)
  object-name: "schedule-0" W
  object-type: schedule
  present-value: INACTIVE
  description: "schedule object 0" W
  effective-period: {(*, *--*), (*, *--*)} W
  weekly-schedule:
  {{{08:00:00.00,ACTIVE},{16:00:00.00,INACTIVE}},{08:00:00.00,ACTIVE},{16:00:00.
  00,INACTIVE}},{08:00:00.00,ACTIVE},{16:00:00.00,INACTIVE}},{08:00:00.00,ACTIV
  E},{16:00:00.00,INACTIVE}},{08:00:00.00,ACTIVE},{16:00:00.00,INACTIVE}},{},{}}
  W
  exception-schedule: {} W
  list-of-object-property-references: ((binary-output, 1033), present-
  value)) W
  priority-for-writing: 16 W
}
{
  object-identifier: {Trend-log, 1001)
  object-name: "AI01-HDB"
  object-type: trend-log
  description: "MFA01 Loop70"
  log-enable: T W
  stop-when-full: F
  buffer-size: 1000
  log-buffer: ?
  record-count: ? W
  total-record-count: ?
  notification-threshold: 500
  records-since-notification: ?
  previous-notify-time: ?
  current-notify-time: ?
  event-state: NORMAL
  notification-class: 4
  event-enable: {F,F,T}
  acked-transitions: {F,F,F}
  notify-type: EVENT
  event-time-stamps: ?
}
}

```

End of BACnet Protocol Implementation Conformance Statement

-- end of file --