

BACnet Protocol Implementation Conformance Statement

Date: April 23, 2018
Vendor Name: Lenze Americas
Product Name: i500
Product Model Number: I51AExxxx10xxxxxxS
Application Software Version: V05.02.00.xx
Firmware Revision: V01.04
BACnet Protocol Version: 1
BACnet Protocol Revision: 16



Product Description:

The i500 is a high-quality inverter that already conforms to future standards in accordance with the EN 50598-2 efficiency classes (IE). Overall, this provides a reliable and future-proof drive for a wide range of machine applications. Its distinguishing features: a streamlined design, scalable functionality, and exceptional user-friendliness. It supports native BACnet and allows direct connectivity to MS/TP network.

BACnet Standardized Device Profile (Annex L):

- BACnet Operator Workstation (B-OWS)
- BACnet Advanced Operator Workstation (B-AWS)
- BACnet Operator Display (B-OD)
- BACnet Building Controller (B-BC)
- BACnet Advanced Application Controller (B-AAC)
- BACnet Application Specific Controller (B-ASC)**
- BACnet Smart Sensor (B-SS)
- BACnet Smart Actuator (B-SA)

List all BACnet Interoperability Building Blocks Supported (Annex K):

- Data Sharing- ReadProperty-B (**DS-RP-B**)
- Data Sharing- ReadPropertyMultiple-B (**DS-RPM-B**)
- Data Sharing- WriteProperty-B (**DS-WP-B**)
- Data Sharing- WritePropertyMultiple-B (**DS-WPM-B**)
- Data Sharing- ChangeofValue-B (**DS-COV-B**)
- Alarm and Event Management – NotificationInternal-B (**AE-N-I-B**)
- Alarm and Event Management – Information-B (**AE-INFO-B**)
- Device Management- DynamicDeviceBinding-B (**DM-DDB-B**)
- Device Management- DynamicObjectBinding-B (**DM-DOB-B**)
- Device Management- DeviceCommunicationControl-B (**DM-DCC-B**)
- Device Management- ReinitializeDevice-B (**DM-RD-B**) *Password required

Segmentation Capability:

- Able to transmit segmented messages Window Size: 3
- Able to receive segmented messages Window Size: 3
- Not supported

Standard Object Types Supported:

Object Type:	Dynamically Creatable?:	Dynamically Deleteable?:	Properties Supported: (Required in 'BOLD')	Writable Properties:	Conditionally Writable Properties:	Proprietary Properties:	Property Range Restrictions:
Device	NO	NO	Object Identifier Object Name Object Type System Status Vendor Name Vendor Identifier Model Name Firmware Revision Application Software Version Description Protocol Version Protocol Revision Protocol Services Supported Protocol Object Types Supported Object List Max APDU Length Accepted Segmentation Supported Max Segments Accepted APDU Segment Timeout APDU Timeout Number of APDU Retries Max Master Max Info Frames Device Address Binding (feature itself is not supported) Database Revision Active COV Subscriptions Property List	Object Name Description Max Info Frames Max Master			
Analog Input	NO	NO	Object Identifier Object Name Object Type Present Value Status Flags Event State Out-of-Service Units Min Present Value Max Present Value COV Increment ** Resolution Property List ** Defaults to value of object's Resolution property	COV Increment			

Object Type:	Dynamically Creatable?:	Dynamically Deleteable?:	Properties Supported: (Required in 'BOLD')	Writable Properties:	Conditionally Writable Properties:	Proprietary Properties:	Property Range Restrictions:
Analog Output	NO	NO	Object Identifier Object name Object Type Present Value Status Flags Event State Out-of-Service Units Min Present Value Max Present Value Priority Array * Relinquish Default * COV Increment ** Resolution Property List <i>* For Commandable values only.</i> <i>** Defaults to value of object's Resolution property</i>	Present Value Relinquish Default COV Increment			
Analog Value	NO	NO	Object Identifier Object Name Object Type Present Value Status Flags Event State Out-of-Service Units Priority Array * Relinquish Default * Min Present Value Max Present Value COV Increment ** Resolution Property List <i>* For Commandable values only.</i> <i>** Defaults to value of object's Resolution property</i>	Present Value Relinquish Default COV Increment			
Binary Input	NO	NO	Object Identifier Object Name Object Type Present Value Status Flags Event State Out-of-Service Polarity Active Text Inactive Text Property List				

Object Type:	Dynamically Creatable?:	Dynamically Deleteable?:	Properties Supported: (Required in 'BOLD')	Writable Properties:	Conditionally Writable Properties:	Proprietary Properties:	Property Range Restrictions:
Binary Value	NO	NO	Object Identifier Object Name Object Type Present Value Status Flags Event State Out-of-Service Inactive Text Active Text Priority Array * Relinquish Default * Time Delay ** (default = 0) Notification Class ** Alarm Value ** (default = Active) Event Enable ** (default: OFF) Acked Transitions ** Notify Type ** Event Time Stamps ** Event Detection Enable ** (set to: Enable) Property List * For Commandable values only. ** For Event reporting BV objects only	Present Value Relinquish Default Time Delay Alarm Value Event Enable			
Notification Class	NO	NO	Object Identifier Object Name Object Type Description Notification Class Priority ACK Required Recipient List Property List	Priority			

Data Link Layer Options:

- BACnet IP, (Annex J)
- BACnet IP, (Annex J), Foreign Device
- ISO 8802-3, Ethernet (Clause 7)
- ATA 878.1, 2.5 Mb. ARCNET (Clause 8)
- ATA 878.1, EIA-485 ARCNET (Clause 8), baud rate(s) _____
- MS/TP master (Clause 9), baud rate(s): 9600, 19200, 38400, 57600, 76800, 115200**
- MS/TP slave (Clause 9), baud rate(s): 9600, 19200, 38400, 57600, 76800, 115200**
- Point-To-Point, EIA 232 (Clause 10), baud rate(s): _____
- Point-To-Point, modem, (Clause 10), baud rate(s): _____
- LonTalk, (Clause 11), medium: _____
- BACnet/ZigBee (ANNEX O)
- Other: _____

Device Address Binding:

Is static device binding supported? (This is currently necessary for two-way communication with MS/TP slaves and certain other devices.) Yes **No**

Networking Options:

- Router, Clause 6 - List all routing configurations, e.g., ARCNET-Ethernet, Ethernet-MS/TP, etc.
- Annex H, BACnet Tunneling Router over IP
- BACnet/IP Broadcast Management Device (BBMD)
 - Does the BBMD support registrations by Foreign Devices? Yes No
 - Does the BBMD support network address translation? Yes No

Network Security Options:

- Non-secure Device - is capable of operating without BACnet Network Security**
- Secure Device - is capable of using BACnet Network Security (NS-SD BIBB)
 - Multiple Application-Specific Keys:
 - Supports encryption (NS-ED BIBB)
 - Key Server (NS-KS BIBB)

Character Sets Supported:

Indicating support for multiple character sets does not imply that they can all be supported simultaneously.

- ISO 10646 (UTF-8) IBM™/Microsoft™ DBCS ISO 8859-1
- ISO 10646 (UCS-2) ISO 10646 (UCS-4) JIS X 0208
- ANSI X3.4 (ANSI INCITS 4-1986 (R2012))

If this product is a communication gateway, describe the types of non-BACnet equipment/networks(s) that the gateway supports:

Supported Object Types and Properties

Binary Input Object Instance Summary

Instance ID	Object Name	Description	Present Value Access	Active/Inactive text
BI:0	Digital Input 1	Status of Digital Input 1	R	Active/Not Active
BI:1	Digital Input 2	Status of Digital Input 2	R	Active/Not Active
BI:2	Digital Input 3	Status of Digital Input 3	R	Active/Not Active
BI:3	Digital Input 4	Status of Digital Input 4	R	Active/Not Active
BI:4	Digital Input 5	Status of Digital Input 5	R	Active/Not Active

NOTE: For Present Value Access Types, **R** = Read-only, **W** = Writeable, **C** = Commandable, **E** = Event Notification

Binary Value Object Instance Summary

Instance ID	Object Name	Description	Present Value Access	Active/Inactive text
BV:0	Not active	Reserved (0x400E.001 = 0 Not active)	R/W/C	Active/Not Active
BV:1	Not active	Reserved (0x400E.002 = 0 Not active)	R/W/C	Active/Not Active
BV:2	Quick stop	0x400E.003 = 3 Activate quick stop	R/W/C	Active/Not Active
BV:3	Not active	Reserved (0x400E.004 = 0 Not active)	R/W/C	Active/Not Active
BV:4	Run forward	0x400E.005 = 8 Run forward (CW)	R/W/C	Active/Not Active
BV:5	Setp: Preset b0	0x400E.006 = 18 Activate preset (bit0)	R/W/C	Active/Not Active
BV:6	Setp: Preset b1	0x400E.007 = 19 Activate preset (bit1)	R/W/C	Active/Not Active
BV:7	Reset error	0x400E.008 = 4 Reset Error	R/W/C	Active/Not Active
BV:8	Not active	Reserved (0x400E.009 = 0 Not active)	R/W/C	Active/Not Active
BV:9	DC braking	0x400E.010 = 5 Activate DC braking	R/W/C	Active/Not Active
BV:10	Not active	Reserved (0x400E.011 = 0 Not active)	R/W/C	Active/Not Active
BV:11	Not active	Reserved (0x400E.012 = 0 Not active)	R/W/C	Active/Not Active
BV:12	Reverse rot. dir.	0x400E.013 = 13 Reverse rotational direct.	R/W/C	Active/Not Active
BV:13	Not active	Reserved (0x400E.014 = 0 Not active)	R/W/C	Active/Not Active
BV:14	Not active	Reserved (0x400E.015 = 0 Not active)	R/W/C	Active/Not Active
BV:15	Not active	Reserved (0x400E.016 = 0 Not active)	R/W/C	Active/Not Active
<p>Attention: BV00-BV15 trigger the functions mapped by the drive parameters 0x400E:001 – 0x400E:016 (default mappings are listed above). While the object name that appear on BACnet network for these points are valid at the time of mapping, those descriptors do not update if the drive configuration is altered after the BACnet master is configured. The user may change these drive parameters to map other discrete functions; however this should be completed prior to setting up the BACnet master so as to keep the descriptors accurate. Any change to BV00-BV15 mapping configuration increases Database Revision property of Device Object.</p>				
BV:16	Mailbox Read	Writing 1 triggers “Read” from drive index entered in “Mailbox Parameter”. If successful, read value is available in object “Mailbox Data”	R/W	Active/Not Active
BV:17	Mailbox Write	Writing 1 triggers “Write” of value from object “Mailbox Data” into drive index entered in “Mailbox Parameter”.	R/W	Active/Not Active
BV:18	Reserved	Reserved	R	Active/Not Active
BV:19	Reserved	Reserved	R	Active/Not Active
BV:20	E:Faulted/Trip	0x400C.001.bit0 – Fault/Trip active	R/E	Active/Not Active
BV:21	E:Warning Active	0x400C.001.bit1 – Warning active	R/E	Active/Not Active
BV:22	E:Running Forward	0x400C.001.bit2 – Running Forward	R/E	Active/Not Active
BV:23	E:Running Reverse	0x400C.001.bit3 – Running Reverse	R/E	Active/Not Active

Instance ID	Object Name	Description	Present Value Access	Active/Inactive text
BV:24	E:Ready	0x400C.001.bit4 – Ready	R/E	Active/Not Active
BV:25	E:Control from Network	0x400C.001.bit5 – Network control active	R/E	Active/Not Active
BV:26	E: Reference from Network	0x400C.001.bit6 – Network setpoint active	R/E	Active/Not Active
BV:27	E:At Reference	0x400C.001.bit7 – At Reference	R/E	Active/Not Active
BV:28	Profile State bit0	0x400C.001.bit8 – Profile-State bit0	R	Active/Not Active
BV:29	Profile State bit1	0x400C.001.bit9 – Profile-State bit1	R	Active/Not Active
BV:30	Profile State bit2	0x400C.001.bit10 – Profile-State bit2	R	Active/Not Active
BV:31	Profile State bit3	0x400C.001.bit11 – Profile-State bit3	R	Active/Not Active
BV:32	E:PID active	0x400C.001.bit12 – Process controller active	R/E	Active/Not Active
BV:33	E:Torque mode active	0x400C.001.bit13 – Torque mode active	R/E	Active/Not Active
BV:34	E:Current Limit	0x400C.001.bit14 – Current limit reached	R/E	Active/Not Active
BV:35	E:DC Brake Active	0x400C.001.bit15 – DC braking active	R/E	Active/Not Active
BV:36	Reserved	User Object 1 when configured as BV	R/W*	Active/Not Active
BV:37	Reserved	User Object 2 when configured as BV	R/W*	Active/Not Active

NOTE: For Present Value Access Types, **R** = Read-only, **W** = Writeable, **C** = Commandable, **E** = Event Notification

* R/W access depends on the drive parameter that is mapped into the User Object

Analog Input Object Instance Summary

Instance ID	Object Name	Description	Present Value Access	Units
AI:0	AI1 terminal %	0x2DA4:001 Analog input at terminal AI1	R	%
AI:1	AI1 terminal %	0x2DA5:001 Analog input at terminal AI2	R	%

NOTE: For Present Value Access Types, **R** = Read-only, **W** = Writeable, **C** = Commandable, **E** = Event Notification

Analog Output Object Instance Summary

Instance ID	Object Name	Description	Present Value Access	Units
AO:0	NetWordIN3	0x4008.003 Analog output setup value	R/W/C	%

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Analog Value Object Instance Summary

Instance ID	Object Name	Description	Present Value Access	Units
AV:0	Net.freq 0.01	0x400B.005 Network Frequency Setpoint	R/W/C	0.01Hz
AV:1	PID Setpoint	0x400B.007 Network PIDSetpoint [PIDunit]	R/W/C	-

Instance ID	Object Name	Description	Present Value Access	Units
AV:2	Target torque	0x6071.000 Target Torque	R/W/C	%
AV:3	Accelerat. time 1	0x2917.00 Acceleration time 1	R/W	sec
AV:4	Decelerat. Time 1	0x2918.00 Deceleration time 1	R/W	sec
AV:5	QSP dec. time	0x291C.00 Quick stop decel time	R/W	sec
AV:6	Reserved	Reserved	-	-
AV:7	Reserved	Reserved	-	-
AV:8	Freq. setp. src.	Set default setpoint source 0x2860:001	R/W/C	-
AV:9	Network Control	Activate Network Control 0x2631.037	R/W/C	-
AV:10	Save Parameters	Save parameters 0x2022.003	R/W	-
AV:11	Mailbox Parameter	Index/subindex of the drive parameter that is being read or write. Format 0xAAAABB00	R/W	-
AV:12	Mailbox Data	Value read or to be written to/from Index/subindex entered in AV:11 Mailbox Parameter	R/W	-
AV:13	Frequency 0.01	0x400C.006 Actual Frequency (ABS0.01Hz)	R	Hertz
AV:14	Error Code	0x603F.000 Error Code	R	-
AV:15	Drive Status	0x400C.005 Drive Status	R	-
AV:16	Motor Voltage	0x2D89.000 Motor Voltage [VAC]	R	V
AV:17	Motor Current	0x2D88.000 Motor Current [0.01A]	R	A
AV:18	Current Actual	0x6078.000 Motor load [0.1% of rated]	R	%
AV:19	Effective power	0x2DA2.001 Effective output power	R	kW
AV:20	Apparent power	0x2DA2.002 Apparent output power	R	kVA
AV:21	Heatsink temp.	0x2D84.001 Heatsink temperature [0.1C]	R	Deg. Celsius
AV:22	DC-bus voltage	0x2D87.000 DC Bus Voltage [0.1VDC]	R	V
AV:23	PID process var.	0x401F.002 PID actual feedback [PIDunit]	R	-
AV:24	Torque Actual	0x6077.000 Torque Actual [% of nominal]	R	%
AV:25	Active control	0x282B.001 Active Control Source	R	-
AV:26	Active setpoint	0x282B.002 Active Setpoint Source	R	-
AV:27	Reserved	Reserved	-	-
AV:28	Reserved	Reserved	-	-
AV:29	Reserved	User Object 1 when configured as AV	R/W*	*
AV:30	Reserved	User Object 2 when configured as AV	R/W*	*

NOTE: For Present Value Access Types, **R** = Read-only, **W** = Writeable, **C** = Commandable, **E** = Event Notification

* R/W access and Units depend on the drive parameter that is mapped into the User Object