

Omni BEMS Controllers

PROTOCOL IMPLEMENTATION CONFORMANCE STATEMENT (PICS)



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This document uses BACnet specific terms and language.

Document Management

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Conformance Statement (PICS)

Revision History

Version Number	Date	Summary of Changes
1.0	December 2015	First Release of the PICS for Omni BEMS Controllers
1.1	December 2016	Image update

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Preliminary Information

Introduction

This document is a Protocol Implementation Conformance Statement (PICS) for the Innotech® Omni BEMS (Building & Energy Management System) Controllers as required by the American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE) Standard 135-2010 BACnet protocol. This document contains information on the BACnet interoperability building blocks that are currently supported by the Innotech Omni BEMS Controller models.

Product Description

The **Innotech Omni BEMS** controller is a state of the art digital processing systems suitable for many types of control applications typically found in HVAC, Building & Energy Management and Process Control.

Omni's extensive feature set includes: a cross-platform web-server, programmable points (true UI/O) with expandability, on-board SQL database, optional & customisable HMI (Human-Machine Interface) for serviceability, and programmable communications channels (Up to 3 RS485 and 2 Ethernet). Omni supports BACnet/IP, BACnet MS/TP, Routing, BBMD, other industry standard protocols including the Innotech protocol. (Ensuring complete backwards compatibility with any existing Innotech Control System.)

Omni's on-board web-server is complete with: supervisory monitoring and control, time-scheduling, alarms and notifications, log data extraction and graphing, access control, and a truly innovative commissioning interface that allows viewing of the controller configuration in real-time for: calibration, over-ride, tuning and BACnet testing and modifications on the fly. This can be achieved by the local controller connection, Wi-Fi, or via an existing internet connection. Omni can be used as a complete BEMS solution for small individual premises, and is scalable (and affordable) for large multi-site institutions where existing BACnet systems may already exist. With no ongoing client software licensing fees, Omni is a truly sustainable BEMS solution with unparalleled life-cycle costs.

Product Details

Table 1: Product Details Table

Item	Details
Date	19th November 2015
Vendor Name	Innotech Control Systems Australia (BACnet Vendor ID 199)
Product Name	Innotech Omni BEMS Controller
Product Model Number(s)	Omni C14, Omni C14D, Omni C20, Omni C20D, Omni C40, Omni C40D
Firmware Version	1.0
BACnet Protocol Revision	12

Omni BEMS Controllers

Introduction

This section contains information on the BACnet interoperability building blocks that are currently supported by the Innotech Omni BEMS Controllers.

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 Smart Sensor (B-SS)
- BACnet Smart Actuator (B-SA)

BACnet Interoperability Building Blocks Supported (Annex K)

Data Sharing

Table 2: Data Sharing Table

Item	Details
Data Sharing-COV-A	DS-COV-A
Data Sharing-COV-B	DS-COV-B
Data Sharing-COV-Unsubscribed-A	DS-COVU-A
Data Sharing-COV-Unsubscribed-B	DS-COVU-B
Data Sharing-COVP-B	DS-COVP-B
Data Sharing-ReadProperty-A	DS-RP-A
Data Sharing-ReadProperty-B	DS-RP-B
Data Sharing-ReadPropertyMultiple-A	DS-RPM-A
Data Sharing-ReadPropertyMultiple-B	DS-RPM-B
Data Sharing-WriteProperty-A	DS-WP-A
Data Sharing-WriteProperty-B	DS-WP-B
Data Sharing-WritePropertyMultiple-B	DS-WPM-B

Alarm & Event Management

Table 3: Alarm & Event Management Table

Item	Details
Alarm and Event-ACK-B	AE-ACK-B
Alarm and Event-Alarm Summary-B	AE-ASUM-B
Alarm and Event-Enrollment Summary-B	AE-ESUM-B
Alarm and Event-Information-B	AR-INFO-B
Alarm and Event-Notification Internal-B	AE-N-I-B

Scheduling

Table 4: Scheduling Table

Item	Details
Scheduling-Internal-B	SCHEM-I-B
Scheduling-External-B	SCHEM-E-B

Trending

Table 5: Trending Table

Item	Details
Trending-Automated Trend Retrieval-B	T-ATR-B
Trending-Viewing and Modifying Trends Internal-B	T-VMT-I-B

Device & Network Management

Table 6: Device & Network Management Table

Item	Details
Device Management-Automatic Time Synchronization-A	DM-ATS-A
Device Management-Backup and Restore-B	DM-BR-B
Device Management-Dynamic Device Binding-A	DM-DDB-A
Device Management-Dynamic Device Binding-B	DM-DDB-B
Device Management-Dynamic Object Binding-A	DM-DOB-A
Device Management-Dynamic Object Binding-B	DM-DOB-B
Device Management-DeviceCommunicationControl-B	DM-DCC-B
Device Management-List Manipulation-B	DM-LM-B
Device Management-Manual Time Synchronization-A	DM-MTS-A
Device Management-Restart-A	DM-R-A
Device Management-Restart-B	DM-R-B
Device Management-ReinitializeDevice-B	DM-RD-B
Device Management-TimeSynchronization-A	DM-TS-A
Device Management-TimeSynchronization-B	DM-TS-B
Device Management-UTCTimeSynchronization-A	DM-UTC-A
Device Management-UTCTimeSynchronization-B	DM-UTC-B

Segmentation Capability

- Segmented Requests Supported, window size: 16
 - Segmented Responses Supported, window size: 16
-

Standard Object Types Supported**Table 7:** Standard Supported Objects Table

Object Type	Can Be Added Dynamically	Can Be Deleted Dynamically
Analog Input	No	No
Analog Output	No	No
Analog Value	No	No
Binary Input	No	No
Binary Output	No	No
Binary Value	No	No
Calendar	No	No
Device	No	No
Event Enrollment	No	No
File	No	No
Large Analog Value	No	No
Loop	No	No
Multi-State Input	No	No
Multi-State Output	No	No
Multi-State Value	No	No
Notification Class	No	No
Schedule	No	No
Trend Log	No	No

Supported Object Properties

Table 8: Supported Objects Properties - Analog Input Table

Object Property	Read/Write	Property Data Type
Object_Identifier	Read Only	BACnetObjectIdentifier
Object_Name	Read Only	CharacterString
Object_Type	Read Only	BACnetObjectType
Present_Value	Read/Write	REAL
Description	Read Only	CharacterString
Device_Type	Read Only	CharacterString
Status_Flags	Read Only	BACnetStatusFlags
Event_State	Read Only	BACnetEventState
Reliability	Read Only	BACnetReliability
Out_of_Service	Read/Write	BOOLEAN
Update_Interval	Read Only	Unsigned
Units	Read Only	BACnetEngineeringUnits
COV_Increment	Read Only	REAL
Min_Pres_Value	Read Only	REAL
Max_Pres_Value	Read Only	REAL
Resolution	Read Only	REAL

Table 9: Supported Objects Properties - Analog Output Table

Object Property	Read/Write	Property Data Type
Object_Identifier	Read Only	BACnetObjectIdentifier
Object_Name	Read Only	CharacterString
Object_Type	Read Only	BACnetObjectType
Present_Value	Read/Write	REAL
Description	Read Only	CharacterString
Device_Type	Read Only	CharacterString
Status_Flags	Read Only	BACnetStatusFlags
Event_State	Read Only	BACnetEventState
Reliability	Read Only	BACnetReliability
Out_of_Service	Read/Write	BOOLEAN
Units	Read Only	BACEngineeringUnits
Min_Pres_Value	Read Only	REAL
Max_Pres_Value	Read Only	REAL
Resolution	Read Only	REAL
Priority_Array	Read Only	BACnetPriorityArray
Relinquish_Default	Read Only	REAL
COV_Increment	Read Only	REAL

Supported Object Properties (Continued)

Table 10: Supported Objects Properties - **Analog Value Table**

Object Property	Read/Write	Property Data Type
Object_Identifier	Read Only	BACnetObjectIdentifier
Object_Name	Read Only	CharacterString
Object_Type	Read Only	BACnetObjectType
Present_Value	Read/Write	REAL
Description	Read Only	CharacterString
Status_Flags	Read Only	BACnetStatusFlags
Event_State	Read Only	BACnetEventState
Reliability	Read Only	BACnetReliability
Out_of_Service	Read/Write	BOOLEAN
Units	Read Only	BACEngineeringUnits
Priority_Array	Read Only	BACnetPriorityArray
Relinquish_Default	Read Only	REAL
COV_Increment	Read Only	REAL

Table 11: Supported Objects Properties - **Binary Input Table**

Object Property	Read/Write	Property Data Type
Object_Identifier	Read Only	BACnetObjectIdentifier
Object_Name	Read Only	CharacterString
Object_Type	Read Only	BACnetObjectType
Present_Value	Read/Write	BACnetBinaryPV
Description	Read Only	CharacterString
Device_Type	Read Only	CharacterString
Status_Flags	Read Only	BACnetStatusFlags
Event_State	Read Only	BACnetEventState
Reliability	Read Only	BACnetReliability
Out_of_Service	Read/Write	BOOLEAN
Polarity	Read Only	BACnetPolarity

Supported Object Properties (Continued)

Table 12: Supported Objects Properties - **Binary Output Table**

Object Property	Read/Write	Property Data Type
Object_Identifier	Read Only	BACnetObjectIdentifier
Object_Name	Read Only	CharacterString
Object_Type	Read Only	BACnetObjectType
Present_Value	Read/Write	BACnetBinaryPV
Description	Read Only	CharacterString
Device_Type	Read Only	CharacterString
Status_Flags	Read Only	BACnetStatusFlags
Event_State	Read Only	BACnetEventState
Reliability	Read Only	BACnetReliability
Out_of_Service	Read/Write	BOOLEAN
Polarity	Read Only	BACnetPolarity
Priority_Array	Read Only	BACnetPriorityArray
Relinquish_Default	Read Only	BACnetBinaryPV

Table 13: Supported Objects Properties - **Binary Value Table**

Object Property	Read/Write	Property Data Type
Object_Identifier	Read Only	BACnetObjectIdentifier
Object_Name	Read Only	CharacterString
Object_Type	Read Only	BACnetObjectType
Present_Value	Read/Write	BACnetBinaryPV
Description	Read Only	CharacterString
Status_Flags	Read Only	BACnetStatusFlags
Event_State	Read Only	BACnetEventState
Reliability	Read Only	BACnetReliability
Out_of_Service	Read/Write	BOOLEAN
Priority_Array	Read Only	BACnetPriorityArray
Relinquish_Default	Read Only	BACnetBinaryPV

Supported Object Properties (Continued)

Table 14: Supported Objects Properties - **Calendar Object Table**

Object Property	Read/Write	Property Data Type
Object_Identifier	Read Only	BACnetObjectIdentifier
Object_Name	Read Only	CharacterString
Object_Type	Read Only	BACnetObjectType
Description	Read Only	CharacterString
Present_Value	Read Only	BOOLEAN
Date_List	Read/Write	BACnetLIST of BACnetCalendarEntry

Table 15: Supported Objects Properties - **Device Object Table**

Object Property	Read/Write	Property Data Type
Object_Identifier	Read Only	BACnetObjectIdentifier
Object_Name	Read Only	CharacterString
Object_Type	Read Only	BACnetObjectType
System_Status	Read Only	BACnetDeviceStatus
Vendor_Name	Read Only	CharacterString
Vendor_Identifier	Read Only	Unsigned16
Model_Name	Read Only	CharacterString
Firmware_Revision	Read Only	CharacterString
Application_Software_Version	Read Only	CharacterString
Location	Read Only	CharacterString
Description	Read Only	CharacterString
Protocol_Version	Read Only	Unsigned
Protocol_Revision	Read Only	Unsigned
Protocol_Services_Supported	Read Only	BACnetServicesSupported
Protocol_Object_Types_Supported	Read Only	BACnetObjectTypesSupported
Object_List	Read Only	BACnetARRAY[N]of BACnetObjectIdentifier
Max_APDU_Length_Accepted	Read Only	Unsigned
Segmentation_Supported	Read Only	BACnetSegmentation
Max_Segments_Accepted	Read Only	Unsigned
Local_Time	Read Only	Time
Local_Date	Read Only	Date
UTC_Offset	Read Only	INTEGER
Daylight_Savings_Status	Read Only	BOOLEAN
APDU_Segment_Timeout	Read Only	Unsigned
APDU_Timeout	Read Only	Unsigned
Number_of_APDU_Retries	Read Only	Unsigned
Time_Synchronization_Recipients	Read/Write	BACnetLIST of BACnetRecipient
Max_Master	Read/Write	Unsigned (1..127)
Max_Info_Frames	Read/Write	Unsigned

Supported Object Properties (Continued)

Table 15 Continued

Object Property	Read/Write	Property Data Type
Device_Address_Binding	Read Only	List of BACnetAddressBinding
Database_Revision	Read Only	Unsigned
Configuration_Files	Read Only	BACnetARRAY[N] of BACnetObjectIdentifier
Last_Restore_Time	Read Only	BACnetTimeStamp
Backup_Failure_Timeout	Read/Write	Unsigned16
Backup_Preparation_Time	Read Only	Unsigned16
Restore_Preparation_Time	Read Only	Unsigned16
Restore_Completion_Time	Read Only	Unsigned16
Backup_And_Restore_State	Read Only	BACnetBackupState
Active_COV_Subscriptions	Read Only	BACnetLIST of BACnetCOVSubscription
Last_Restart_Reason	Read Only	BACnetRestartReason
Time_Of_Device_Restart	Read Only	BACnetTimeStamp
Restart_Notification_Recipients	Read Only	BACnetLIST of BACnetRecipient
UTC_Time_Synchronisation_Recipients	Read/Write	BACnetLIST of BACnetRecipient
Time_Synchronisation_Interval	Read/Write	Unsigned
Align_Intervals	Read/Write	BOOLEAN
Interval_Offset	Read/Write	Unsigned

Table 16: Supported Objects Properties - **Event Enrollment Table**

Object Property	Read/Write	Property Data Type
Object_Identifier	Read Only	BACnetObjectIdentifier
Object_Name	Read Only	CharacterString
Object_Type	Read Only	BACnetObjectType
Description	Read Only	CharacterString
Event_Type	Read Only	BACnetEventType
Notify_Type	Read Only	BACnetNotifyType
Event_Parameters	Read Only	BACnetEventParameters
Object_Property_Reference	Read Only	BACnetDeviceObjectPropertyReference
Event_State	Read Only	BACnetEventState
Event_Enable	Read/Write	BACnetEventTransitionBits
Acked_Transitions	Read Only	BACnetEventTransitionBits
Notification_Class	Read Only	Unsigned
Event_Time_Stamps	Read Only	BACnetARRAY[3] of BACnetTimeStamp

Supported Object Properties (Continued)

Table 17: Supported Objects Properties - **File Object Table**

Object Property	Read/Write	Property Data Type
Object_Identifier	Read Only	BACnetObjectIdentifier
Object_Name	Read Only	CharacterString
Object_Type	Read Only	BACnetObjectType
Description	Read Only	CharacterString
File_Type	Read Only	CharacterString
File_Size	Read Only	Unsigned
Modification_Date	Read Only	BACnetDateTime
Archive	Read/Write	BOOLEAN
Read_Only	Read Only	BOOLEAN
File_Access_Method	Read Only	BACnetFileAccessMethod

Table 18: Supported Objects Properties - **Large Analog Value Table**

Object Property	Read/Write	Property Data Type
Object_Identifier	Read Only	BACnetObjectIdentifier
Object_Name	Read Only	CharacterString
Object_Type	Read Only	BACnetObjectType
Description	Read Only	CharacterString
Present_Value	Read Only	Double
Status_Flags	Read Only	BACnetStatusFlags
Reliability	Read Only	BACnetReliability
Out_Of_Service	Read/Write	BOOLEAN
Units	Read Only	BACnetEngineeringUnits
Priority_Array	Read Only	BACnetPriorityArray
Relinquish_Default	Read Only	Double
COV_Increment	Read Only	Double

Supported Object Properties (Continued)

Table 19: Supported Objects Properties - **Loop Object Table**

Object Property	Read/Write	Property Data Type
Object_Identifier	Read Only	BACnetObjectIdentifier
Object_Name	Read Only	CharacterString
Object_Type	Read Only	BACnetObjectType
Present_Value	Read/Write	REAL
Description	Read Only	CharacterString
Status_Flags	Read Only	BACnetStatusFlags
Event_State	Read Only	BACnetEventState
Reliability	Read Only	BACnetReliability
Out_of_Service	Read/Write	BOOLEAN
Update_Interval	Read Only	Unsigned
Output_Units	Read Only	BACnetEngineeringUnits
Manipulated_Variable_Reference	Read Only	BACnetObjectPropertyReference
Controlled_Variable_Reference	Read Only	BACnetObjectPropertyReference
Controlled_Variable_Value	Read Only	REAL
Controlled_Variable_Units	Read Only	BACnetEngineeringUnits
Setpoint_Reference	Read Only	BACnetSetpointReference
Setpoint	Read Only	REAL
Action	Read Only	BACnetAction
Proportional_Constant	Read Only	REAL
Proportional_Constant_Units	Read Only	BACnetEngineeringUnits
Integral_Constant	Read Only	REAL
Integral_Constant_Units	Read Only	BACnetEngineeringUnits
Derivative_Constant	Read Only	REAL
Derivative_Constant_Units	Read Only	BACnetEngineeringUnits
Bias	Read Only	REAL
Maximum_Output	Read Only	REAL
Minimum_Output	Read Only	REAL
Priority_For_Writing	Read Only	Unsigned
COV_Increment	Read Only	REAL
Deadband	Read Only	REAL

Supported Object Properties (Continued)

Table 20: Supported Objects Properties - **Multi-State Input Table**

Object Property	Read/Write	Property Data Type
Object_Identifier	Read Only	BACnetObjectIdentifier
Object_Name	Read Only	CharacterString
Object_Type	Read Only	BACnetObjectType
Present_Value	Read/Write	Unsigned
Description	Read Only	CharacterString
Device_Type	Read Only	CharacterString
Status_Flags	Read Only	BACnetStatusFlags
Event_State	Read Only	BACnetEventState
Reliability	Read Only	BACnetReliability
Out_of_Service	Read/Write	BOOLEAN
Number_Of_States	Read Only	Unsigned
State_Text	Read Only	BACnetARRAY[N] of CharacterString

Table 21: Supported Objects Properties - **Multi-State Output Table**

Object Property	Read/Write	Property Data Type
Object_Identifier	Read Only	BACnetObjectIdentifier
Object_Name	Read Only	CharacterString
Object_Type	Read Only	BACnetObjectType
Present_Value	Read/Write	Unsigned
Description	Read Only	CharacterString
Device_Type	Read Only	CharacterString
Status_Flags	Read Only	BACnetStatusFlags
Event_State	Read Only	BACnetEventState
Reliability	Read Only	BACnetReliability
Out_of_Service	Read/Write	BOOLEAN
Number_Of_States	Read Only	Unsigned
State_Text	Read Only	BACnetARRAY[N] of CharacterString
Priority_Array	Read Only	BACnetPriorityArray
Relinquish_Default	Read Only	Unsigned

Supported Object Properties (Continued)

Table 22: Supported Objects Properties - **Multi-State Value Table**

Object Property	Read/Write	Property Data Type
Object_Identifier	Read Only	BACnetObjectIdentifier
Object_Name	Read Only	CharacterString
Object_Type	Read Only	BACnetObjectType
Present_Value	Read/Write	Unsigned
Description	Read Only	CharacterString
Status_Flags	Read Only	BACnetStatusFlags
Event_State	Read Only	BACnetEventState
Reliability	Read Only	BACnetReliability
Out_of_Service	Read/Write	BOOLEAN
Number_Of_States	Read Only	Unsigned
State_Text	Read Only	BACnetARRAY[N] of CharacterString
Priority_Array	Read Only	BACnetPriorityArray
Relinquish_Default	Read Only	Unsigned

Table 23: Supported Objects Properties - **Notification Class Table**

Object Property	Read/Write	Property Data Type
Object_Identifier	Read Only	BACnetObjectIdentifier
Object_Name	Read Only	CharacterString
Object_Type	Read Only	BACnetObjectType
Description	Read Only	CharacterString
Notification_Class	Read Only	Unsigned
Priority	Read Only	BACnetARRAY[3] of Unsigned
Ack_Required	Read Only	BACnetEventTransitionBits
Recipient_List	Read/Write	BACnetLIST of BACnetDestination

Supported Object Properties (Continued)
Table 24: Supported Objects Properties - **Schedule Object Type Table**

Object Property	Read/Write	Property Data Type
Object_Identifier	Read Only	BACnetObjectIdentifier
Object_Name	Read Only	CharacterString
Object_Type	Read Only	BACnetObjectType
Present_Value	Read Only	Any
Description	Read Only	CharacterString
Effective_Period	Read/Write	BACnetDateRange
Weekly_Schedule	Read/Write	BACnetARRAY[7] of BACnetDailySchedule
Exception_Schedule	Read/Write	BACnetARRAY[N] of BACnetSpecialEvent
Schedule_Default	Read Only	Any
List_Of_Object_Property_References	Read/Write	BACnetLIST of BACnetDeviceObjectPropertyReference
Priority_For_Writing	Read Only	Unsigned (1..16)
Status_Flags	Read Only	BACnetStatusFlags
Reliability	Read Only	BACnetReliability
Out_Of_Service	Read/Write	BOOLEAN

Table 25: Supported Objects Properties - **Trend Log Table**

Object Property	Read/Write	Property Data Type
Object_Identifier	Read Only	BACnetObjectIdentifier
Object_Name	Read Only	CharacterString
Object_Type	Read Only	BACnetObjectType
Description	Read Only	CharacterString
Enable	Read/Write	BOOLEAN
Start_Time	Read/Write	BACnetDateTime
Stop_Time	Read/Write	BACnetDateTime
Log_DeviceObjectProperty	Read Only	BACnetDeviceObjectPropertyReference
Log_Interval	Read/Write	Unsigned
COV_Resubscription_Interval	Read Only	Unsigned
Client_COV_Increment	Read Only	BACnetClientCOV
Stop_When_Full	Read/Write	BOOLEAN
Buffer_Size	Read Only	Unsigned32
Log_Buffer	Read Only	BACnetLIST of BACnetLogRecord
Record_Count	Read Only	Unsigned32
Total_Record_Count	Read Only	Unsigned32
Logging_Type	Read Only	BACnetLoggingType
Status_Flags	Read Only	BACnetStatusFlags
Trigger	Read Only	BOOLEAN
Event_State	Read Only	BACnetEventState

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)
- MS/TP master (Clause 9), baud rate(s) — 9600, 19200, 38400, 57600, 76800, 115200 bps
- MS/TP slave (Clause 9), baud rate(s) — 9600, 19200, 38400, 57600, 76800, 115200 bps
- Point-To-Point, EIA 232 (Clause 10)
- Point-To-Point, modem, (Clause 10)
- LonTalk, (Clause 11), medium
- BACnet/ZigBee (ANNEX O)

Networking Options

- Router, Clause 6
- Annex H, BACnet Tunnelling Router over IP
- BACnet/IP Broadcast Management Device (BBMD)
 - Does the BBMD support registrations by Foreign Devices?
 - Does the BBMD support network address translation?

Networking Security Options

- Non-secure device capable of operating without BACnet Network Security
- Secure device 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

- ISO 10646 (UTF-8)
- IBM™ /Microsoft™ DBCS
- JIS X 0208
- ISO 10646 (UCS-4)
- ISO 10646 (UCS-2)
- ISO 8859-1

Device Address Binding

Static device binding is supported.

Innotech Support

Innotech provides technical information on the Web to assist you with using its products.

At www.innotech.com.au, you can find technical manuals, user instructions, and data sheets for all our products.

For direct product support or product information, contact your local distributor, or an Innotech representative.

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