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Modbus Register Mapping to BACnet® Objects Added to BAS Remote Version 3.0

Modbus to BACnet mapping has been added to BAS Remote Version 3.0, providing even more functionality to the already versatile building automation appliance. The BAS Remote 3.0 series provides the system integrator with a flexible building block when integrating diverse building automation protocols or when expanding the number of points in a building automation system. By supporting open system protocols such as BACnet, Modbus and Sedona SOX, the BAS Remote's versatility has significantly improved.

Besides the addition of *Powered by Sedona Framework™* to release 3.0, Contemporary Controls added support for BACnet Change of Value (COV-B), Read Property Multiple (RPM), Foreign Device Registration (FDR), and Modbus register to BACnet object mapping.

"The new features added to the BAS Remote have generated universal appeal," said Joe Stasiek, Sales Manager at Contemporary Controls. "Many customers are interested in the BAS Remote's new Modbus mapping capability, which has improved the BAS Remote's ability to integrate different protocols on the same job."

Although BACnet is quite popular, there is an abundance of Modbus Serial equipment that needs to attach to the building



Version 3.0 of the BAS Remote has several new important features

automation system. There are two approaches to the problem. The first is to route Modbus Serial messages from the BAS Remote Master MB port to Modbus TCP clients residing on Ethernet. This is the simplest approach requiring minimal configuration. The BAS Remote Master would act as a proxy for a Modbus TCP client, initiating a command to a connected Modbus Serial slave. When the slave responds, the message is forwarded to the Modbus TCP client. The resident BAS

Remote Master I/O can be queried in a similar fashion by simply assigning this I/O a non-conflicting Modbus address on the device's web page. The second approach is to utilize the gateway capability within the BAS Remote Master. Using an off-line spreadsheet, Modbus registers and slave addresses are mapped alongside BACnet object instances. The spreadsheet creates a CSV file which is downloaded into the BAS Remote Master for periodic scanning. The result is that attached Modbus Serial devices can be viewed as BACnet objects.

"In addition to the Modbus mapping, function block programming using Sedona Framework means even more open system protocols are supported by the BAS Remote," said Mr. Stasiek.

The BAS Remote Master incorporates Sedona Virtual Machine (SVM) technology developed by Tridium and com-

patible with their Niagara Framework™. Using established Tridium tools such as Workbench, a system integrator can develop a control application using Workbench's powerful drag-and-drop visual programming methodology. Once developed, the program remains stored in the BAS Remote Master and executes by way of the SVM. The application can run standalone in the BAS Remote Master or interact with a program in a Tridium JACE supervisory controller over Ethernet. The number of potential applications is only limited by the imagination of the system integrator.

"The BAS Remote provides the versatility our customers demand," said George Thomas, president of Contemporary Controls. "The utility device provides additional input/output capability, routing and gateway functionality and now Modbus mapping and logic powered by Sedona Framework. It's a critical building multifunction tool."

More information, including a new 12-page application guide can be found at <http://www.ccontrols.com/basautomation/basremote.htm>

Technology UPDATE

Broadcast Storm Control

Broadcast messages are those sent to all possible destinations on a network. An Ethernet switch is designed to differentiate traffic by target destination—thereby achieving more efficient communication than is possible with a repeating hub. But if broadcast messages are sent when a switch is in the network, the switching strategy is defeated and the switch behaves much like a repeating hub.

A broadcast message is one with a destination MAC ID value of all ones (FF FF FF FF FF FF). Too many of such messages can be problematic, but Ethernet switches have a feature called **Broadcast Storm Control** that can be employed to mitigate the issue. However, under some circumstances, Broadcast Storm Control can itself cause problems.

Broadcast Storm Control is **disabled** on all unmanaged (plug-and-play) switches from Contemporary Controls. This policy was adopted because some users will suffer dropped messages if they employ an Ethernet strategy that sends **continuous broadcast messages**. Instead of sending **directed** messages that use the essential characteristic of a switch, some applications deliberately broadcast messages to every device—even though only one may need it. Since Broadcast Storm Control is seldom needed by most users, Contemporary Controls made a conscious decision in October 2008 to disable this feature on all unmanaged products.

Contemporary Controls offers a configurable switch (the EISC Series) in which Broadcast Storm Control can, at the user's discretion, be enabled or disabled **globally** (applying to all ports or to none). On **managed** switches, Broadcast Storm Control is not explicitly available. Instead, a similar strategy is accomplished with a feature known as **Rate Control** which allows the user to control rates of various types of traffic and vary the control by port. Like unmanaged switches, our managed switches have this feature disabled by default—but it can be enabled by the user quite easily.

If a customer wishes, unmanaged switches from Contemporary Controls can have Broadcast Storm Control enabled at the factory—by request and at no charge. When enabled, each switch port will drop broadcast packets after receiving a continuous stream of 64 broadcast packets. The counter will reset to 0 every 800 ms or if it receives a non-broadcast packet (one whose destination MAC ID is something other than FF FF FF FF FF FF).

An expanded version of this article—with information about how to perform a test to determine whether or not Broadcast Storm Control is in effect—is available online at: www.ccontrols.com/blog/blog.htm

Paul French Joins CCL as EMEA Sales Manager



*EMEA Sales Manager
Paul French*

Contemporary Controls Ltd (CCL), located in Coventry, UK, recently announced the addition of a sales manager for the Europe, Middle East and Africa (EMEA) region. Paul French, who has managed distributor channels across Europe, will be tasked with taking a fresh look at Contemporary Controls' EMEA distribution channels.

"The Middle East has shown a significant interest in our building automation and industrial automation product lines," said George Thomas, president of Contemporary Controls. "Paul will help us introduce the newly released BAS Remote 3.0 with Sedona Framework™ and our CTRLink Ethernet connectivity products to the Middle East."

Contemporary Controls Ltd and Contemporary Controls GmbH (CCG) based in Leipzig, Germany, share responsibility for the EMEA region. "We want to be more proactive within the EMEA market," said Mr. French. "My intention is to firmly establish Contemporary Controls as a market leader in automation controls for the region."

Mr. French previously worked for Microsoft Gold partners, delivering tailored Enterprise Resource Planning (ERP) solutions to manufacturers within vertical industries. "I see a lot of similarities between the industries," said Mr. French, "especially the size and the number of players within one marketplace. In the automation controls market, Contemporary Controls stands out because we deliver solutions that are based on 30 years of experience in electronics design, development and manufacturing."

To contact Mr. French, please e-mail paulf@ccontrols.co.uk or telephone +44 (0)24 7641 3768.

Free Configuration Tools for Commissioning Modbus to BACnet Mapping

Project Name		GT's Project				Project Builder Modbus to BACnet		View Built Project	
		<div style="display: flex; justify-content: space-around;"> Add Modbus Profile Delete Modbus Profile </div>		<div style="display: flex; justify-content: space-around;"> Edit Description Text Edit Modbus ID </div>		<div style="display: flex; justify-content: space-around;"> Edit Poll and COV on the worksheet Build Project </div>		<div style="display: flex; justify-content: space-around;"> View Documented Project View Errors </div>	
<small>Double click on the column header text below for more information about the column. Columns with an * allow editing the information, by double clicking on the selected cell.</small>									
Device	Modbus Profile file location	Modbus Profile Name	Description Location *	Modbus ID *	Worksheet Name to Configure Poll/COVs *	Configured Polls/COVs			
1	C:\mapping\Final_09_04_09 M2B\Modbus	WattNode	Rafter	31	Rafter WattNode31	149 / 1			
2	C:\mapping\Final_09_04_09 M2B\Modbus	Air Care	Basement	34	Basement Air Care34	20 / 0			
3	C:\mapping\Final_09_04_09 M2B\Modbus	My Power Meter	1st flr	33	1st flr My Power Meter33	1 / 0			

Contemporary Controls has developed two off-line Excel VBA programs to assist system integrators in integrating Modbus register-to-BACnet object mapping for the BAS Remote. The first program called Modbus Profiler is used to characterize the Modbus device in a format usable for the second program called the Project Builder. Modbus serial devices attach to the MB port on the BAS Remote. Each Modbus device has a set of registers and each one of those registers has a description of the register that can be found in the user manual for the Modbus device. The system integrator builds a profile of the Modbus device in a spreadsheet by transferring over the register location, description of the register, the type of variable (16-bit or 32-bit) and if it is a read/write or read-only register. It is not necessary to list all the registers—only those that are to be scanned by the BAS Remote. Once all the necessary registers are accounted for, the profile is complete and can join a library of Modbus profiles.

The second step is to load the required profiles into the Project Builder. Up to 30 Modbus devices can be added to the project—with a project being defined as those devices being scanned by the same BAS Remote. The profiles for these devices can be the same or can be different. When devices are added to the project, each must be assigned a unique Modbus device address. An optional field exists for entering the location of the Modbus device which would be helpful when several of the same devices are being used. Once all the data has been entered, the Project Builder generates a scan list in a csv formatted file for downloading into the BAS Remote. Once loaded in flash memory, the BAS Remote is rebooted and begins scanning the Modbus devices.

In order to reduce configuration time, Contemporary Controls will develop Modbus profiles of the more popular Modbus devices such as energy meters. These Modbus profiles will be available for download from the company's web site along with the Project Builder software.

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