

# Data Acquisition System (DAS)



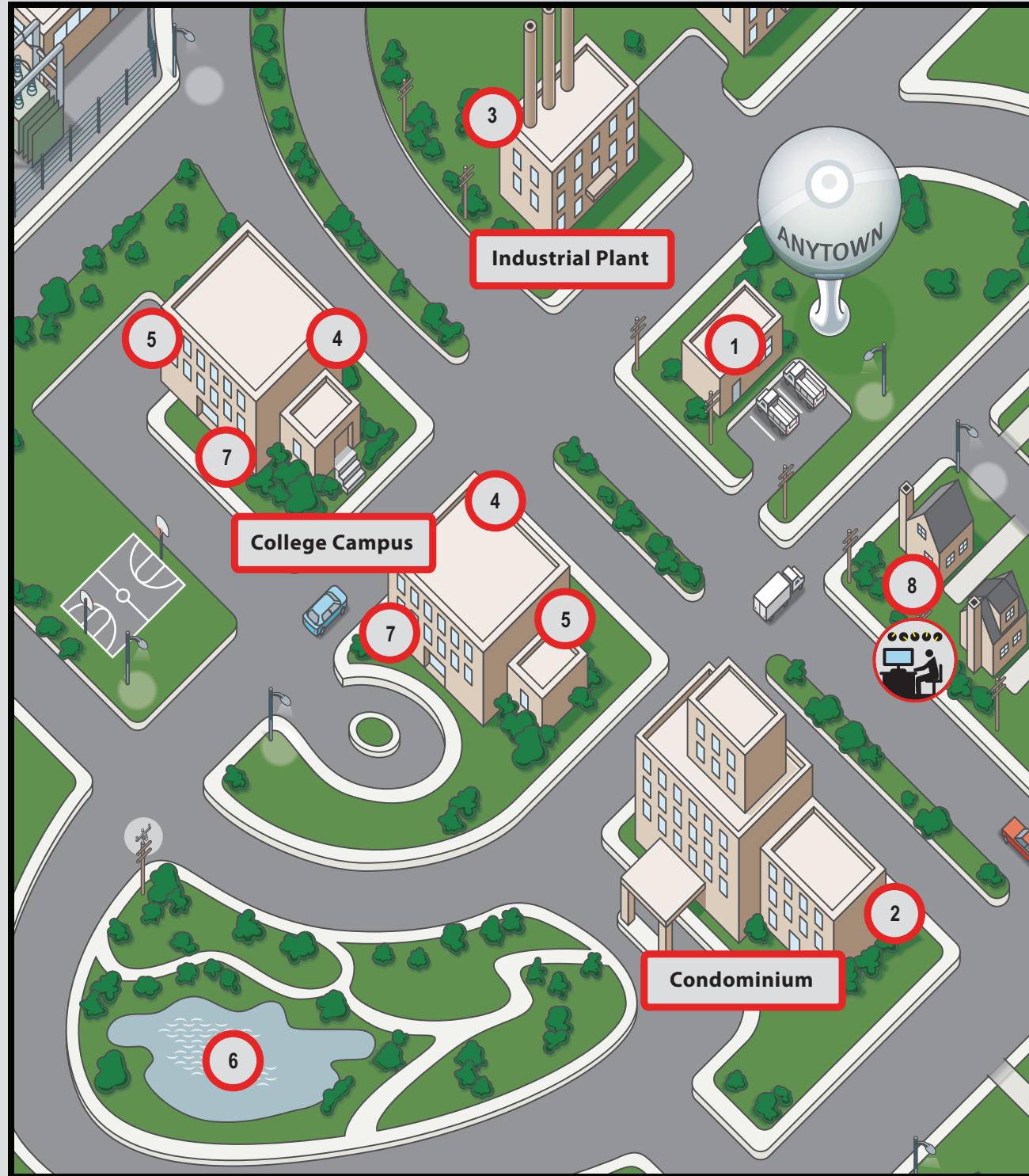
# Data Acquisition System (DAS)

Badger Meter is a leading supplier of flow meters and related equipment. Established in 1905, Badger Meter has continued to innovate flow measurement solutions that provide benefits in many applications. Accurately measuring flow and other instrument data is the first part of obtaining information from an application. Collecting and managing that information is the next part.

Instrument data has been collected in a variety of manners. Observing a local display has been a traditional method and remains popular today. Connecting output from a sensor to a data management system on a pulse, analog, or bus communication line is also widely used. In the recent past, wireless technology has allowed for remote connectivity without the need for wires. This of course simplifies the installation of each device.

No matter your choice of how data is gathered, either wired or wireless, the data needs to be stored and managed so it can be used. Dataloggers, databases, and other data storage methods are all found in applications around world. Many of these systems require custom software and hardware and use closed protocol systems that lock a user into that specific infrastructure.

Gathered data can then be used to benefit the user by demonstrating instrument conditions at the times that the data was collected. This is what many users are trying to accomplish in the most simple and cost effective manner possible. This is where the Data Acquisition System (DAS) from Badger Meter comes in by offering these and many more features.



## Example Product Configurations

- 1 **Water Treatment Plant**  
8" mag meter(s) measuring raw sewage coming into the plant
- 2 **Condo/Apartment**  
Model 25 used for sub-metering tenants
- 3 **Industrial Plant**  
Measuring water used in multiple processes or test labs
- 4 **College Campus**  
Sub-metering of water to all buildings on campus
- 5 **College Campus**  
Condensate return metering using Model 250B
- 6 **Irrigation Flow Sensor**  
on pond pump outlet, Model 220B
- 7 **Condominium**  
6 btu meters per floor, Series 380
- 8 **Industrial Plant Manager**  
at home, logging onto Model 3700 to respond to alarm

### What is it?

The Badger Meter Model 3700 is a TCP/IP based DAS that allows for simple setup and configuration. Simply connect an Ethernet cable and use standard browser software to connect and configure the unit. The Model 3700 also uses a standard modbus input. Data exchange on this protocol on wired devices or through the Model R9120-5 modbus mesh network transceiver greatly expands the number of inputs that can be acquired.

### How does it work?

Like other technologies, the Model 3700 DAS records input data into a log file that a user can view when needed. The eight dynamic inputs can receive a variety of instrument connections. These can be pulse, resistance, current or voltage. The modbus input allows for up to 249 additional channel inputs. These could be used for expansion of pulse and analog inputs or for adding a variety of modbus based devices.

### What is the Model R9120-5 and how does it work?

The Badger Meter Model R9120-5 is a modbus based transceiver. When more than one of these units are used, it creates a self-healing mesh network. This network can be connected directly to the Model 3700 via the modbus input. Each Model R9120-5 allows for two pulse inputs and a modbus input. These transceivers create a wireless network that benefits many applications by simplifying installation and reduces cost, while adding a large number of device inputs and offering easy expandability for the future.

### What is the Model 350T?

The Badger Meter Model 350T is a short hop Radio Frequency (RF) transmitter that can connect to many scaled pulse outputs. The 350T is a battery powered unit which allows for remote connectivity. The Model 350R is the receiving end of the 350T. This can be installed with a Model R9120-5 or a Model 3700 and add data into the network.

### What if I need more inputs?

The A8911-23 is an I/O expansion module that is modbus based. It allows for four additional pulse inputs and four analog inputs. This device can be added on the modbus network either at the Badger Meter Model 3700 or at any Badger Meter Model R9120-5. Additionally, the HD pulse input allows for 23 pulse inputs on one Modbus address.

### Put it all together

Using the Model 3700 by itself or with multiple Model R9120-5 units and/or with multiple modules creates a data acquisition system that is both highly functional and simple to use and maintain. Adding devices can be done quickly for future expansion. The user can plug the Model 3700 into a LAN and collect the data from literally anywhere in the world.



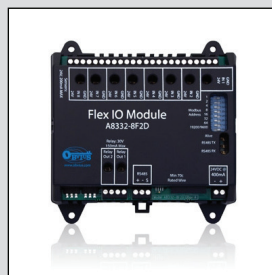
Model 3700



Model R9120-5



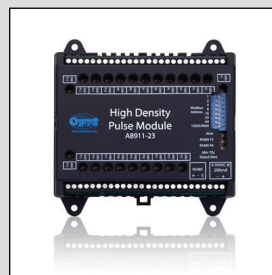
Model 350T



A8322-8F2D



Series 380 Btu System



A8911-23

# Badger Meter products compatible with the Data Acquisition System:



## SDI Series

The SDI Series is a line of full-featured stainless steel or bronze body insertion flowmeters suited for a wide variety of applications.



## 200 Series

200 Series flowmeters are available in bronze, stainless steel and plastic versions. They may be mounted in pipe sizes of 2.5" or greater and have a hot tap option.



## 228 and 250 Series

These meters are part of the 200 Series which utilize a variety of plastic and metal service tees. Ranging in pipe sizes from 1/2" to 4", these meters offer a simple method of installing a flowmeter into smaller line sizes.



## 4000 Series

The 4000 Series is a compact in-line style impeller flowmeter. Units are available in pipe sizes ranging from 1/2" to 3/4", and 1" line sizes in either PVC or PVDF materials.



## Wireless Flow Meter

The 350T Radio Transmitter and 350R Radio Receiver pair provide a wireless solution for a variety of flow meter applications.



## Accessories

Badger offers transmitters, monitors, relays, and many other accessory items. All of these expand the versatility of our meter products and other technologies.



## Badger® Series 380 Btu System

The Series 380 Btu Systems provides a low cost system for metering cold or hot systems. The 380 BTU sensor can accurately measure flow and temperature differential to compute energy. Utilizing either BACnet or Modbus RS-485 communications protocols, or a scaled pulse output, the Btu Meter can interface with many existing control systems.



## RCDL Disc Meters -

### Positive Displacement - Nutating Disc

The RCDL Disc Meter combines the accuracy of positive displacement design with the reliability and economy of nutating disc technology. Well suited for measuring the flow of water and other fluids, hot or cold, this meter can be combined with most Badger® mechanical and electronic accessories for applications from batching to inventory control.



## Industrial Turbo Meters - Turbine Flow

With its rugged design, the Industrial Turbo Meter can withstand the toughest flow conditions. This meter is ideally suited where continuous service and minimal maintenance are required.



## Recordall® Turbo Meters - Turbine Flow

The Recordall Turbo Meter is ideally suited for any water application, performing with great accuracy over a wide flow range. It also has very low pressure loss, increasing system efficiency. Sizes available are 11/2" to 20" (DN 40 to DN 500).



## Electromagnetic Flow Meters

Badger Meter's advanced electromagnetic designs deliver up to 0.25% accuracy. The non-intrusive design virtually eliminates pressure loss. Since there are no moving parts in the flow stream, maintenance is kept to a minimum. A large variety of size configurations and liner materials are available ranging in sizes from 1/24" to 54" (DN1 - DN1400).

## Where would I use this system?

There are countless applications that could benefit from this technology. College campuses, industrial facilities, military bases, shopping centers, condominiums, irrigation, and remote applications are very common users of these systems.

## Other Technologies

Many other manufacturer's devices can be connected to this Data Acquisition System. Instruments with an output can be connected either directly or conditioned with a signal transmitter. This additionally expands the functionality of this system.

## Connection Devices and Example Applications

Please refer to Application Brief DAB-054-02/DAS FLYER for additional information on connection devices and example applications.

## Control. Manage. Optimize.

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