



# Application Note: Crestron System Integration

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This application note describes how to integrate a Crestron system with North.

Please read the *DataSync Driver Manual*, and *Commander Manual* or *ObSys Manual* alongside this document, available from [www.northbt.com](http://www.northbt.com)

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# Compatibility with the Crestron System

The Crestron system connects to North using the DataSync driver, available for Commander and ObSys.

The DataSync driver provides a simple text-based API to the North device's Essential Data and Extra Data, allowing the Crestron system to synchronise with and adjust information from the database.

Crestron utilise the range of HVAC drivers available in North devices, including interfaces to BACnet, Modbus, KNX, Mitsubishi, Daikin, Hitachi, Zip, and Heatmiser.

The DataSync API uses a client-server model. The server (North device) provides values from a database to a single client device (Crestron processor) when requested or on a change of value.

A Crestron Certified Programmer will need to create an application that implements the client role. Connect using TCP/IP or RS232 to provide two-way communication.

The Crestron 3-Series can also connect to North using the BACnet standard. For more than 50 values, an additional licence must be purchased for the Crestron control system. For information on the BACnet driver available in North devices please read the *BACnet/IP Driver Manual*.

## Equipment

Crestron control system components compatible with North include:

- 3-Series Processors – PRO3, AV3, CP3N, CP3, DIN-AP3
- 2-Series Processors

## Values

Crestron can connect to the DataSync API using simple text-based line commands. The API presents values from the North device's Essential Data and Extra Data. Essential Data contains 640 values on Commander, and 1280 values on ObSys. If necessary, start the Extra Data driver (which requires an interface licence) for an additional 1024 values. Access to these values can be controlled by configuring privilege levels within the driver.

## Prerequisites

A Certified Crestron Programmer will need to create an application, using SIMPL Windows, to implement the DataSync API. Give them a copy of this document, the *DataSync Driver Manual*, and a list of the objects configured in Essential Data.

# DataSync API Summary

The DataSync API provides a simple text-based protocol for a Crestron application to remain synchronised with the data held in a North device's database. This database, created using Essential Data and Extra Data, is updated with data from the building – this will be site specific, but could include information from systems such as air conditioning, building automation, fire detection, HVAC, lighting, energy metering, security, etc. The North engineer should provide a list of objects in this database to the Crestron programmer.

The API uses a stateless client-server model. The Crestron application shall implement the client role, with the North device the server role to provide values from Essential Data and Extra Data.

The North device, or server, maintains the database and automatically sends notifications to the connected client device when a value changes. It will also respond to queries sent by the client.

The application, or client, should maintain a copy of the database by listening to value change notifications from the server device. You can send queries to the server – updating a value in the database, requesting a list of all values from the database after connecting, monitoring for database changes, or requesting the database configuration.

## Connection

Establish a connection to the North device either by opening a TCP/IP connection (recommended), or by connecting to an RS232 COM port.

The default TCP/IP port number used by DataSync is 1920.

RS232 connections use 19200 baud, no parity, 8 data bits, 1 stop bit, and no flow control. Refer to [Making the Cable](#) for the details of the RS232 cable.

## Message Format

The client sends a query and the server a notification message, as documented in each API method within the *DataSync Driver Manual*.

Messages must be formatted as a line of text with ISO-8859-1 character encoding. Each line of text, or message, must finish with the end-of-message marker – represented in this manual using the symbol: ↵. The North device sends a carriage return (control code x0D hex) then a line feed (control code x0A hex) as the end-of-message marker; the application may send both or just one of these characters.

Allow for a maximum message length of 136 characters.

Here is a sample query and notification:

Query

```
LIST↵
```

Notification

```
V0000=12.3↵
V0001=43↵
V0002=1↵
V0003=0↵
V0004=Smart-UPS 450↵
V0005=14/08/14 | 17:38:38↵
V0006=00:00-08:30,18:00-24:00↵
V0007=00:00=18,09:00=21↵
```

## Heartbeats

To monitor for a healthy connection between client and server, a heartbeat message should be sent if either end has not sent another message for 90 seconds.

If either the client or server has not received any message for 3 x 90 seconds, then it should close the connection. The client should then reconnect to the server.

Heartbeat messages are recommended, but optional, and should be enabled within the DataSync driver.

A heartbeat message is an empty message, with only the end-of-message marker sent:

Query

```
↵
```

Notification

```
↵
```

## Database Values

The API presents values from the North device's Essential Data and Extra Data. Essential Data contains 640 values on Commander, and 1280 values on ObSys. Extra Data contains an additional 1024 values. These values are organised in pages, with each page containing 10, 16, 32, or 64 objects, and each object holding a single value.

The values from Essential Data may be accessed using any of the supported API methods. A single address range is used for all functions – 0...639 on Commander, and 0...1279 on ObSys. This object identifier (oid) maps to the standard Essential Data page/object reference as follows:

DataSync oid	Essential Data object reference	DataSync oid	Essential Data object reference
0	P1.01	16	P2.01
1	P1.02	17	P2.02
2	P1.03	18	P2.03
3	P1.04	19	P2.04
4	P1.05	..	..
..	..	479	P30.016
15	P1.016	..	..

If Extra Data is used, the extra 1024 values appear in oids that follow on from Essential Data's – i.e. oid 640...1663 on Commander, or 1280...2303 on ObSys.

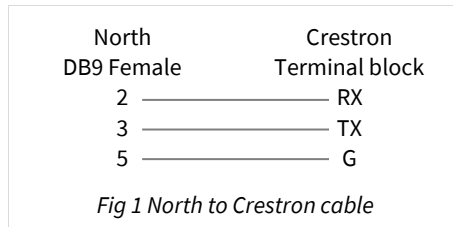
The oid field is a four-digit number in API methods. For compatibility with DataSync version 1.0, enable Legacy Mode (A.LM) in DataSync Advanced Setup to restrict this to a three-digit field in the range 0...999.

# Using the Driver

On ObSys and Commander, the DataSync driver is pre-installed. Once started, you will need to set up the driver before the Crestron system can synchronise with the data.

## Making the Cable

If connecting via RS232: using the cable specification (Fig. 1), connect the North device COM port to the Crestron control processor's COM port using a null-modem cable. Connector types at each end of the cable are shown.



The maximum RS232 cable length is 15m.

## Starting the Interface

- 📖 To start an interface using the DataSync driver, follow these steps:
  - **Start Engineering** your North device using ObSys
  - Navigate to **Configuration, Interfaces**, and set an unused **Interface** to 'DataSync' to start the particular interface
  - Navigate to the top-level of your North device and re-scan it

The driver setup object (Mc), labelled **DataSync Setup**, should now be available.

## Setting up the Driver

- 📖 To set up the driver, follow these steps:
  - Navigate to the **DataSync Setup** object (Mc). For example, if you started interface 1 with the driver earlier, then the object reference will be 'M1'
  - Set **Mode** (OM) to 'Server' (default)
  - Set **Connection** (CT) to select a 'TCP/IP' (default) or 'RS232' connection. Ask the Crestron Programmer which type they are using
  - If connection is RS232, set **COM Port** (RS.COM) to select the RS232 port number on the North device to use
  - Set **Use heartbeats** (HB) to 'Yes' (default)
  - Navigate to **Advanced Setup** (A)
  - If the Crestron Programmer would like object numbers restricted to a three-digit field, set **Legacy Mode** (LM) to 'Yes'
  - If the Crestron Programmer would like the interface to automatically resend all values on connection, then set **Send LIST** (SL) to 'Yes'

## Checking Communications

After configuring Essential Data, the driver will automatically provide information when requested.

Check the **Connected** object (DS) has a value of 'yes'. This indicates the Crestron application has connected. Use the **Debug – Last Message** object in Advanced Setup to see the last API message sent by the application.

# Document Versions

Version	Issue Date	Details
1.0	9/8/2017	Document released

## Next Steps...

If you require help, contact support on 01273 694422 or visit [www.northbt.com/support](http://www.northbt.com/support)



North Building Technologies Ltd  
+44 (0) 1273 694422  
[support@northbt.com](mailto:support@northbt.com)  
[www.northbt.com](http://www.northbt.com)

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Author: JF  
Checked by: BS

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