

bDexcom is a driver that retrieves Estimated Glucose Values (EGVs) from Dexcom and enables your Control4 system to act based on those values.

This driver is known as a "UI Button" driver. This class of drivers does not use Control4's standard template as an interface but instead can use an icon or series of icons to communicate the driver's status and send commands.

SETUP

- 1) Within your Control4 project, install an instance of the bDexcom driver
- 2) Enter your primary Dexcom username and password

PROPERTIES

DRIVER SETUP

Upgrade Mode	BNet Solutions drivers can automatically update themselves. Options are "Automatic", "Minor Only" and "Upgrade Now". See "Upgrade Mode" section below
Admin Server Enabled	Enables / Disables the driver's Admin Server. See "Admin Server" section below
Admin Port	Listening port assigned to Admin Server
Admin Token	Token required to access the driver's Admin Server

LICENSE SETUP

License Key	Key used to permanently enable driver functionality
License Status	Display current state of driver's license
Driver Version	Installed driver version
MAC Address	Unique network interface identifier for the Controller

DEXCOM SETUP

Username	Dexcom username
Password	Dexcom password

BDEXCOM SETUP

EGV Low Threshold	EGV Low threshold (inclusive) that will trigger alarm. EGV Alarm must be enabled
EGV High Threshold	EGV High threshold (inclusive) that will trigger alarm. EGV Alarm must be enabled
Polling Enabled	Enable/Disable EGV polling. *see EGV Polling section for discussion
EGV Alarm Enabled	Enable/Disable High/Low EGV Alarm
Data Alarm Enabled	Enable/Disable Dexcom Data Alarm. *see Data Alarm section for discussion

DEBUG SETTINGS

License Key	Key used to permanently enable driver functionality
License Status	Display current state of driver's license
Driver Version	Installed driver version
MAC Address	Unique network interface identifier for the Controller

ACTIONS

Get EGV	Retrieve most current EGV from Dexcom
Snooze EGV Alarm	Snoozes an active EGV Hi/Low Alarm

*result can be reviewed in Lua Output with "Debug Mode" set to "Print" and "Debug Level" set to "5-Debug"

COMMANDS

Get EGV	Retrieve most current EGV from Dexcom
Enable Polling	Enables Dexcom polling
Disable Polling	Disables Dexcom polling
Enable EGV Alarm	Enables Hi/Low EGV Alarm
Disable EGV Alarm	Disables Hi/Low EGV Alarm
Snooze EGV Alarm	Snoozes an active EGV Hi/Low Alarm
Enable Data Alarm	Enables Hi/Low Data Alarm
Disable Data Alarm	Disables Hi/Low Data Alarm

EVENTS

EGV Received	Fired when new EGV data is received
EGV Alarm Enabled	Fires when the EGV Alarm is enabled
EGV Alarm Disabled	Fires when the EGV Alarm is disabled
EGV Normal	Fires when EGV is within the "Normal" range as defined by the "EGV High Threshold" Property and the "EGV Low Threshold" Property
EGV High Alarm	Fires when EGV meets or exceeds the "EGV High Threshold" Property and continues to fire with each new "High" value until EGV returns to "Normal" or Alarm is snoozed
EGV Low Alarm	Fires when EGV is equal to or less than the "EGV Low Threshold" Property and continues to fire with each new "Low" value until EGV returns to "Normal" or Alarm is snoozed
EGV Alarm Snoozed	Fires when an active "High" or "Low" EGV Alarm is snoozed
Data Alarm	Fires when the Dexcom data alarm condition is met. *see Data Alarm section for discussion
Data Alarm Enabled	Fires when the Data Alarm is enabled
Data Alarm Disabled	Fires when the Data Alarm is disabled
Polling Enabled	Fires when EGV Polling is enabled
Polling Disabled	Fires when EGV Polling is disabled

CONDITIONALS

EGV Alarm Enabled	True / False
EGV Alarm Active	True / False
EGV Alarm Snoozed	True / False
Data Alarm Enabled	True / False
Data Alarm Active	True / False

EGV POLLING

The original bDexcom driver design provided the ability to modify the poll rate. However, I noticed that all of my Dexcom devices upload their data to the Dexcom cloud every 5 minutes. So, a poll rate of say 1 minute would always result in 1 new value and 4 old values for every 5-minute chunk of time. The current implementation of bDexcom uses the last EGV timestamp to align its polling with the Dexcom data upload cycle. Specifically, it will poll 5 minutes and 10 seconds (for buffer and processing time) after the last uploaded EGV timestamp to minimize polling frequency but get the most current EGV available.

EGV STALE THRESHOLD

bDexcom imposes a 30 minute 'Stale Threshold' on EGVs. That is, the driver will not act on, in any way including to trigger events or alarms, an EGV that is greater than 30 minutes old. There must be some cutoff for old data and 30 minutes feels about right but if you have a different thought, please let me know.

EGV ALARM NOTES

- An EGV Alarm (High or Low) will trigger once the appropriate EGV Threshold is met
- Once triggered, the Alarm remains active until 1) the Alarm is Snoozed or 2) an EGV is received that is "Normal" as defined by the range of EGVs less than the High EGV Threshold and greater than the Low EGV Threshold. This means that the EGV Alarm will continue to trigger for every subsequent High or Low EGV until the EGV returns to "Normal" or the Alarm is Snoozed
- Once Snoozed, no subsequent EGV Alarms will trigger for that alarm session
- If an EGV Alarm is triggered and then returns to "Normal" and a subsequent EGV is received that meets the High or Low threshold, the appropriate Alarm will again trigger

DATA ALARM NOTES

- If bDexcom is unable to retrieve EGV data, it will first attempt to obtain a new security token
- If there are 3 failed attempts to communicate with Dexcom, a "Data Alarm" event is triggered but, unlike the EGV Alarm, will not continue to trigger after each subsequent failed attempt
- Once connectivity is reestablished, the attempt limit is reset and a subsequent 3 fails will again trigger the "Data Alarm"

EGV ICONS

Icons cannot be created dynamically and must exist at the time the driver is packaged and installed on the director - did you notice the 20MB driver size? As a result, certain design decisions were made that may conflict with the driver configuration.

For example, the range of EGV icons available and their green (non-alarm implied) and red (alarm implied) style are predetermined. While the styles match bDexcom's default High and

bDexcom Driver

Low EGV Threshold settings, they may not be consistent with a particular installation's settings.

The below table describes bDexcom's icon set:

	Low EGV Range: 50 - 69
	Normal EGV Range: 70 - 250
	High EGV Range: 250 - 300
	Wait or "dot-dot-dot"
	Off Scale - Less than 50 or greater than 300 EGV

UI BUTTON

As mentioned above, bDexcom is a driver of type "UI Button".

If, within 2 seconds, the bDexcom icon is clicked:

1 time: bDexcom attempts to retrieve the most recent EGV from Dexcom

2+ times: bDexcom snoozes an active alarm

Sending commands via the driver icon works reliably on all connected Navigators (T3s, EA1, etc.) and on the Control4 app when the current view is refreshed (not to be confused with a navigator refresh). That is, unless the app is opened directly to a view that contains the driver, Control4 does not always register a click. Instead, you may need to back out, then navigate back into the view containing the driver icon.

To help discern when Control4 successfully registers a click, the driver's icon changes to the 'dot-dot-dot' icon when it receives a click event and then shows the updated EGV after the click window ends.

ADMIN SERVER

bDexcom Driver

BNet Solutions drivers' have a built-in webserver that looks and behaves like the Properties, Actions and Lua Output tabs for the driver in Composer. The Admin Server's default port for the bDexcom driver is 40700 and is configurable in the driver's properties. Using a web browser, navigate to [http://\[controller ip\]:40700](http://[controller ip]:40700) where "controller ip" is the IP Address of your Control4 Director (EA5, EA3, EA1, etc). For example, <http://192.168.1.100:40700>. The Admin Server is protected by a challenge page that requires a token to continue. By default, the token is "bDexcomAdmin". Once authenticated, the token is stored in a cookie (technically hashed, then stored) so you won't need to log in every time. The token is configurable via the driver's property page. The Admin Server is enabled by default but can be disabled entirely via the driver's property page.

KNOWN ISSUES AND LIMITATIONS

- After the driver is updated via "Update Now", dynamically populated drop-down boxes may appear blank. Refresh the project (File/Refresh) or simply change focus away from then back to this driver to repopulate. This seems to be a Composer issue.

UPGRADE MODE

BNet Solutions drivers can automatically update themselves. New driver functionality or capability is typically packaged as an incremental "Major" version (v3, v4 etc). "Minor" versions (v2.3, v2.4) are typically maintenance releases that update underlying libraries, address a specific issue or usability concern.

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| Automatic | When "Automatic" is selected, the driver will upgrade/update itself when a new version is available. "Automatic" Upgrade Mode is strongly suggested. |
| Minor Only | Restricts the driver from upgrading between major versions but allows updates between minor versions. |
| Update Now | Checks for and upgrades to any newer Major or Minor version. |

TROUBLESHOOTING

All BNet Solutions products have an additional 'Submit' Debug Mode. With this mode selected, the driver creates a unique log file to capture the Lua output based on the selected Debug Level (usually set to "5 - Debug"). Once 'Submit' Debug Mode is deselected, either manually or when the Debug Timer expires, the Submit Debug Log is uploaded to the BNet Solutions Server for analysis.

The server notifies me when Submit files are uploaded but if you have not purchased a license, I have no way to reach out to you for troubleshooting so please email me your contact information.

TRIAL AND PURCHASE

All BNet Solutions drivers are fully functional for a 7-day Trial Period. To continue usage after the Trial Period, you will need to purchase a license. To do so, install the bLicense driver from <https://bnet4solutions.com> and follow the documented purchase steps. There are no refunds so please review the documentation for any limitations or known issues and determine acceptance during the Trial Period.

LEGAL

By using this driver, you are indicating that you have read and agree with the Policies and Terms that govern its usage as published [here](#).

MY CONTACT INFORMATION

You can reach me at blucas@bnet4solutions.com for comments or questions.

bDexcom Driver

CHANGE LOG

v1 - 1/20 Initial Release