# Cylon Unitron UC32 Driver for Tridium Niagara

User Guide

# Contents

1	Introduction	2
2	Requirements	2
3	Quick Start	2
4	Cylon Network	2
5	Cylon Devices	3
<b>6</b> 6.1 6.2	Cylon Points	${3 \\ 4 \\ 4 }$
7	Schedules	4

## 1 Introduction

Cylon <sup>1</sup> Unitron UC32 is a well-known BMS system, which includes a wide range of programmable controllers for HVAC control and building automation. There are two types of Unitron devices: \* field controllers for direct digital control \* communication controllers for information exchange, global schedules and LAN connection

Cylon driver for Niagara is designed to enable communication between Cylon controllers and Tridium Niagara powered devices. It provides an efficient solution for retrofit of building management systems, facilitates seamless integration of multiple protocols and allows convenient makeover of front-end software.

### 2 Requirements

- Niagara-powered device with software v3.8 (AX), v4.1 (N4) or later, including Jace2, Jace3, Jace6, Jace8000, Supervisor or their OEM versions  $^2$
- Cylon driver module and license

Niagara Supervisor or Jace is connected a communication controller UC32.net via TCP/IP network. The communication controller is connected to field controllers via RS-485 port.

# 3 Quick Start

- 1. Copy cylon.jar (AX) or cylon-rt.jar (N4) to both Jace and WorkPlace
- 2. Add Cylon Network to Jace station
- 3. Enter license code in **License** property under **Cylon Network**
- 4. Enter IP address and port in **Tcp Config** property; default port number is 4950
- 5. Open **Cylon Network** and **Discover** devices it should find one communication controller and field controllers if available
- 6. Add controllers to the station
- 7. For each field controller open **Points** extension, **Discover** points or **Import File**, add points to the station
- 8. For each global schedule create a **Boolean Schedule** in the station, then open communication controller **Schedules** extension, use **Import File** to add **Schedule Export** to the station and select **Boolean Schedule** in **Supervisor Ord**; run **Read from controller** action and check if **Boolean Schedule** is filled.

# 4 Cylon Network

Cylon Network contains many standard Niagara properties, as well as few Cylon-specific:

- License the code which allows driver to run on your Host ID
- Tcp Config / Ip Address IP and port (4950 by default) of UC32.net communication controller
- Tcp Config / Site Unitron site number.
- Tcp Config / UC32net Address Communication controller address. Both Site number and UC32net Address could be found in Unitron project or on UC32.net display.

<sup>&</sup>lt;sup>1</sup>All trademarks or registered trademarks are property of their respective owners

 $<sup>^{2}</sup>$ If support for older Niagara versions is required, please contact the vendor

CylonNetwork (Cylon Ne	twork)
🗆 🔘 Status	{ok}
🗆 🔘 Enabled	© true ▼
Fault Cause	
🕀 🔣 Health	Ok [31-Aug-17 2:59 PM BST]
표 👃 Alarm Source Info	Alarm Source Info
1 Monitor	Ping Monitor
🕀 🥜 Tuning Policies	Tuning Policy Map
	N Poll Scheduler
🖃 🎆 Tcp Config	Cylon Tcp Comm Config
🔲 🔘 Fault Cause	
🗆 🔘 Ip Address	192.168.1.151:4950
Ip Address	192.168.1.151
🗆 🔘 Port	unspecified 4950 [-1 - 65536]
🗆 🔘 Site	0
🗆 🔘 Uc32net Address	3 1
🗆 🔘 License	MCwCFAk5uC8sq4V/TusZs5zU/B9rRkJxAhQv9N7V

Figure 1: Cylon Network properties

#### 5 Cylon Devices

There are two types of Unitron devices:

- 1. Cylon Comm Device a communication controller with LAN connection. There is only one per network and always with address 0. This device has Schedules extension for global schedules.
- 2. Cylon Device a field controller with Points extension.

#### 6 Cylon Points

Unitron field controllers points are identified by a type and an address from 1 to 1024 (some models less). Types could be:

- 1. Analog hardware
- 2. Digital hardware
- 3. Analog software
- 4. Digital software

Hardware points are physical inputs and outputs, depending on controller model and configuration. Software points are variables, they could be writable – also called setpoints – or read-only.

Writing into software point *overwrites* its value, i.e. "old" value will be lost. Writing into hardware point *overrides* its value, so then one could return it back to the previous automatic value.

Vion Disco	overy					Success	»	$\otimes$
Discovered							2 obj	jects
Model				Address	Serial			<b>₽</b>
📕 UC32.net Lit	e, Internal Keypad, 1.(	01.52 (	Apr 12 201	0) 0	CNET831256G			
UC32.24 6.1	.6 13/11/07			1	CU24842123C			
								I
Database					•		2 obj	jects
Namo	Turne	Exts	Address	Model		Serial	_	_ Ę₽
Name	туре		I Hadress	Photei		o'criai		
UC32.net.000	Cylon Comm Device		0	UC32.net Lite,	, Internal Keypad, 1.01.52 (Apr 12 2010)	CNET831256G		
UC32.net.000	Cylon Comm Device Cylon Device	6	0	UC32.net Lite, UC32.246.1.6	Internal Keypad, 1.01.52 (Apr 12 2010) 5 13/11/07	CNET831256G CU24842123C		
UC32.net.000	Cylon Comm Device Cylon Device	6	0	UC32.net Lite, UC32.24 6.1.6	Internal Keypad, 1.01.52 (Apr 12 2010) 5 13/11/07	CNET831256G CU24842123C		
UC32.net.000	Cylon Comm Device Cylon Device	6	0	UC32.net Lite, UC32.246.1.6	Internal Keypad, 1.01.52 (Apr 12 2010) 5 13/11/07	CNET831256G CU24842123C		
UC32.net.000	Cylon Comm Device Cylon Device	<b>1</b> ©	0	UC32.net Lite, UC32.246.1.6	Internal Keypad, 1.01.52 (Apr 12 2010) 5 13/11/07	CNET831256G CU24842123C		
UC32.net.000	Cylon Comm Device Cylon Device	<b>0</b>	0	UC32.1et Lite, UC32.246.1.6	Internal Keypad, 1.01.52 (Apr 12 2010) 5 13/11/07	CNET831256G CU24842123C		
UC32.net.000	Cylon Comm Device Cylon Device	6	0	UC32.net Lite, UC32.24 6.1.6	Internal Keypad, 1.01.52 (Apr 12 2010) 5 13/11/07	CNET831256G CU24842123C		
UC32.net.000	Cylon Comm Device Cylon Device	0	0	UC32.net Lite, UC32.24 6.1.6	Internal Keypad, 1.01.52 (Apr 12 2010) 5 13/11/07	CNET831256G CU24842123C		
UC32.net.000	Cylon Comm Device Cylon Device	6	0	UC32.net Lite, UC32.246.1.6	Internal Keypad, 1.01.52 (Apr 12 2010) 5 13/11/07	CNET831256G CU24842123C		
UC32.net.000	Cylon Comm Device Cylon Device	0	0	UC32.net Lite, UC32.246.1.6	Internal Keypad, 1.01.52 (Apr 12 2010) 5 13/11/07	CNET831256G CU24842123C		

Figure 2: Cylon device discovery

Each point is polled by Jace when it is required. Polling frequencies are specified for each point individually and reference polling rated defined in Poll Scheduler as in the most Niagara drivers. This allows to find an optimal solution when reading a lot of points as often as suitable.

There are two ways how to get Unitron points into Niagara: Import File and Discover.

#### 6.1 Point Import from CSV File

**Import File** is a preferred method as it creates all points with names, units, limits and boolean facets. In order to utilise it, one should have access to Unitron project and export its points to CSV files in Cylon Database Interface software. Then in device **Points** extension press Import File and choose exported CSV.

#### 6.2 Point Discovery

**Discover** is another method, which allows to get some point information directly from device. It could be used if Unitron project files are unaccessible. There are few limitations in this method: read-only software points could not be discovered and should be created manually; no point names or facets are available. In general this method still allows to retrieve enough information to build all graphics, although it will require more investigation and engineering.

#### 7 Schedules

Communication controllers store global time schedules and send them to field controllers. Each schedule occupy a number of *blocks* in its memory. Each *block* represent one weekly period for each

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Export To iEix 🔹 🕨 🚍	Current Comms Controller
Export To Movicon 🔹 🕨 🧲	Current Controller (UCxx)
🔛 View Keypad Flags	▼ C Digital C Time Schedule
Exit Alt+F4	C Analog Setpoint C Digital Setpoint C Holiday Schedule
	Comms Controller Time Schedule
Name:	
AHU	
J M. Charle in Cambridge DB	Number II II
I♥ Stole in Controller DB	Change
Show in Summary	Delete
- Show in Summary	
Name	Store Keypad TextView Summary Start Block End Block
I AHU	✓ ✓ 1 10

Figure 3: Export points to CSV file

🥑 賓 Cylon Discovery					Success X	> 🛞
Discovered					32	objects
Point Name	Point Type	Address	Value	Point Facets		<b>1</b>
Room Temp Setpt	Analog Software	10	nan {ok}	units=°C,precision=1,min=0.00,max=100.00		
3rd Stage Frost Setpt	Analog Software	11	nan {ok}	units=°C,precision=1,min=0.00,max=100.00		
External Eco Setpt	Analog Software	20	nan {ok}	units=°C,precision=1,min=0.00,max=100.00		
Boiler Flow Temp SetPt	Analog Software	22	nan {ok}	units=°C,precision=1,min=0.00,max=100.00		=
Boiler Rtn Sequence Setpt	Analog Software	23	nan {ok}	units=°C,precision=1,min=0.00,max=100.00		
📟 Fire Alarm Status	Digital Hardware	1	false {ok}			
📟 Gas Valve Status	Digital Hardware	2	false {ok}	trueText=Closed,falseText=Open		
📟 Pressure Unit Status	Digital Hardware	3	false {ok}	trueText=Fault,falseText=Normal		
Heating Pumps DPS	Digital Hardware	17	false {ok}	trueText=Flow,falseText=No Flow		_
	Station 1	40	<u> </u>			
Database					0	objects
Name Type Out PointType	Address Poll Freq	uency				Ę₽.
🔛 New Folder 🛛 🖓 New	v 📝 Edit	🏥 Disco	ver 🤇	Cancel 💿 Add 🖹 Match	🔹 Import F	ile

Figure 4: Import points from CSV file

day or one special date range.

Niagara could read schedule from Cylon device, map it into a standard **Boolean Schedule** and then write it to controller when necessary. These are the steps:

- 1. Create **Boolean Schedule** somewhere in Niagara station.
- 2. Open communication controller **Schedules** extension, **Import File** or create schedule manually (you will have to know start and end blocks, which this schedule occupies).
- 3. Select Boolean Schedule in Supervisor Ord property.
- 4. When the schedule is created, right-click on it run **Read from controller** action. Open **Boolean Schedule** and check if it is filled properly.
- 5. Change some periods in **Boolean Schedule**, save it and then **Export** it back to controller. It could be done with **Execute** action, **Export** button, periodically using **Execution Time** trigger or by demand.

Cylon global schedules are not identical to Niagara **Boolean Schedules**, so they can't be mapped fully. Because of these limitations in **Boolean Schedule** only **Day** and **Date Range** special events could be used, both with exactly one time period; dates could not have wildcards (\*).

🥑 🍕 Cylon Discovery						Success »	$\otimes$
Discovered						14 obje	ects
Point Name	Point Type	Address	Value	Point Facets			<b>₽</b>
📼 Analog Hardware 1	Analog Hardware	1	1000.00 {ok}				*
📼 Digital Hardware 2	Digital Hardware	2	false {ok}				
📼 Analog Hardware 3	Analog Hardware	3	1000.00 {ok}				
📼 Analog Hardware 23	Analog Hardware	23	0.00 {ok}				Ξ
📼 Digital Hardware 24	Digital Hardware	24	false {ok}				
Analog Software 1	Analog Software	1	5.00 {ok}				
Analog Software 2	Analog Software	2	6.00 {ok}				
Analog Software 100	Analog Software	100	100.00 {ok}				
Analog Software 1023	Analog Software	1023	1023.00 {ok}				-
		1001	4004 00 ( 12				
Database						0 obje	ects
Name Type Out Point Ty	/pe Address Pol	Frequency	/				Ę₽
New Folder	New 😥 Edit	. ģi	Discover	Cancel O Add	Ca Match	🖉 Import File	

Figure 5: Point discovery

Discovered									2 obj	ects
Schedule	Start Block	End Block								<b>₽</b>
📰 Heating	1	10								
Hot Water	11	20								
Database Name Start B	Add Name Heating Name Start B End Blo Superv Executi	Start Block	End Block 10 eating L L0 tation: s lanual V	Supervisor Ord station:  slot:/Log slot:/Logic/E	Execution Tin Manual	ne edule				ts ₹
New	De Edit	🙀 Disco	ver	Cancel	Add	2) Match	🕰 Export	🗐 Imp	ort File	

Figure 6: Schedule creation



Figure 7: Weekly schedule

				4	Pre	v Pa	ge ·	┥ Pr	ev I	1ontl	n 🗌	Гoda	У	Next	t Mo	nt	h Þ	• Ne	ext P	age				
Aug 2017         Sep 2017         Oct 2017																								
		s	m	t	w	t	f	s	s	m	t	w	t	f	s		s	m	t	w	t	f	s	
				1	2	3	4	5						1	2		1	2	3	4	5	6	7	
		6	7	8	9	10	11	12	3	4	5	6	7	8	9		8	9	10	11	12	13	14	
		13	14	15	16	17	18	19	10	11	12	13	14	15	16		15	16	17	18	19	20	21	
		20	21	22	23	24	25	26	17	18	19	20	21	22	23		22	23	24	25	26	27	28	
		27	28	29	30	31			24	25	26	27	28	29	30		29	30	31					
Name Holidays	Summ Date F	ary Range	2: 24	Aug	2017	7 - 15	Sep :	2017												t.	3:(	4A 00		scheduled
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Figure 8: Special days schedule