

Hunter Industries Gateway

Protocol Driver (FS8705-41) For Hunter Industries ACC2

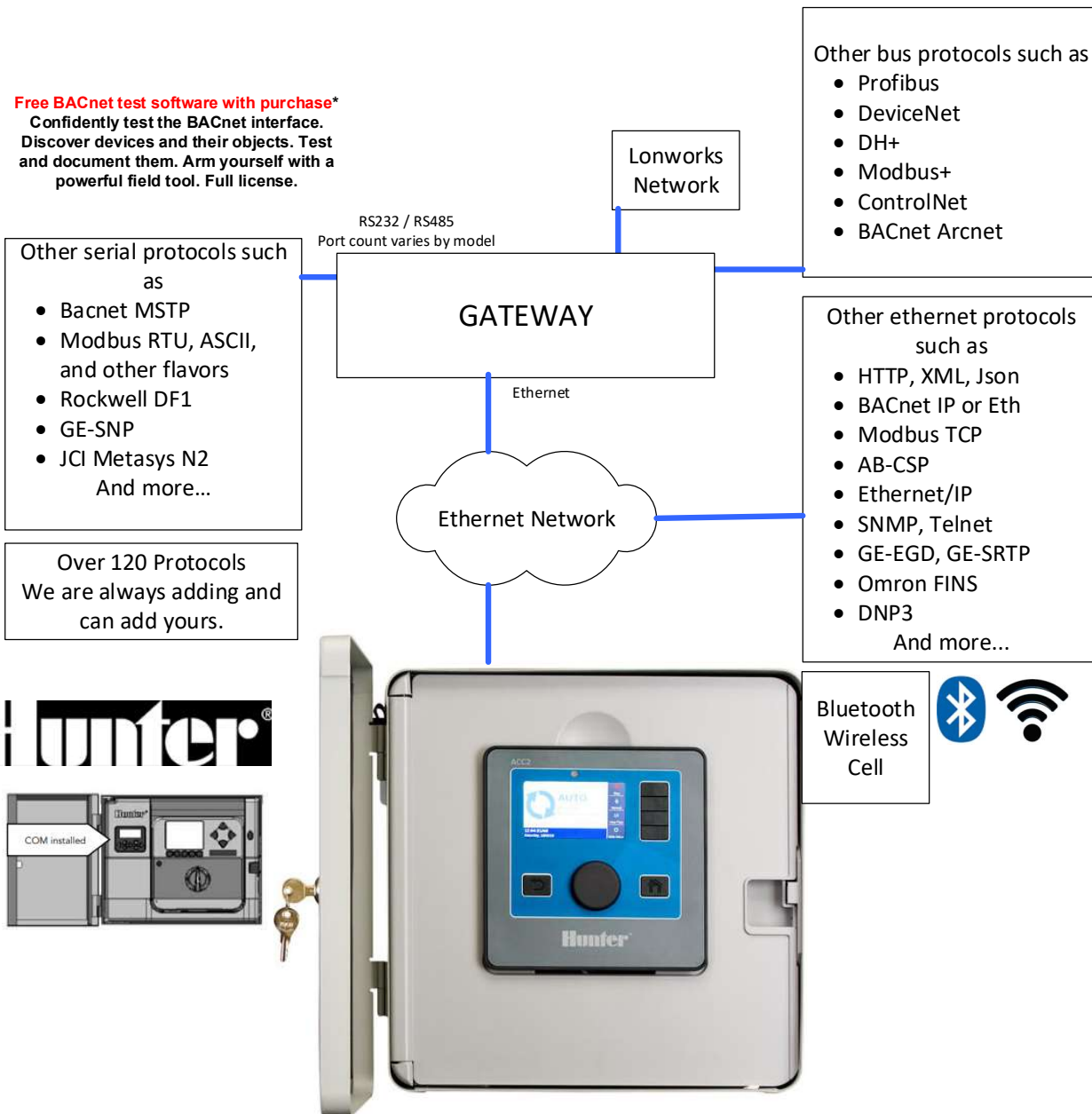
Description

The Hunter ACC2 gateway can be used to connect to suitably enabled Hunter Industries controllers such as the ACC2 Irrigation Controller. The Driver can read and write data, change settings and issue commands to the irrigation system. A single gateway can connect to multiple controller's using this driver.

The Gateway will be an active client in communications with the Hunter controller. This means that the gateway will issue messages to read/write data. The Hunter Controller ACC2 will be a passive server, waiting silently for messages from the gateway to which it will respond. The data read will be cached for serving via a 2nd protocol such as DNP3 to Cimplicity or Modbus / BACnet for a building management system. Any of the over 140 protocols in the gateway library may be connected to the Hunter Driver.

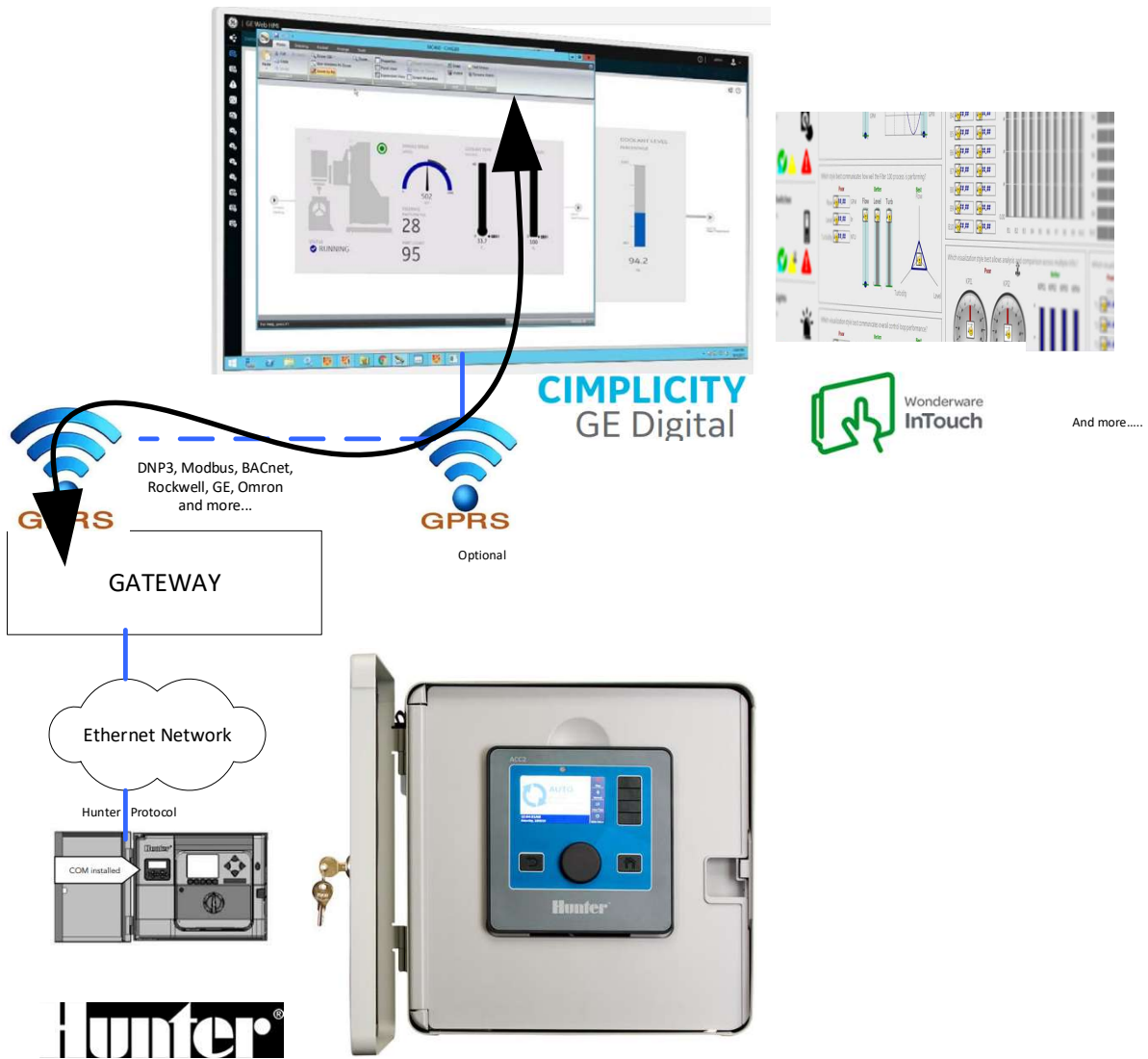
Typical Block Diagram

Free BACnet test software with purchase*
 Confidently test the BACnet interface.
 Discover devices and their objects. Test
 and document them. Arm yourself with a
 powerful field tool. Full license.



Sample Project Block Diagram.

In this sample the Irrigation Sites are monitored from a central location. The Central uses DNP3 (Primary function of Central Station is Power Management). The DNP3 connection is made by means of the mobile network.



Sample Screens showing how data can be used

The following images are screenshots of a Dashboard interface to monitor and control the ACC2. This is how the data might be used for SCADA or GUI purposes. These sample screens are implemented in HTML and javascript. You can use them to learn how the data is used to build your own GUI. Or you can just use these sample pages. **They are available at any time and can be preinstalled on request.** While we used HTML and javascript to read the gateway data using Json, we expect that in most projects protocols like Modbus or BACnet will be used and GUI software like Cimplitiy or IFix (for example) might be used.

192.168.1.168/acc2.html

ACC2 Human Interface



Simple Commands
FIELD CONTROLLER SYSTEM GLOBALS (01 02)
SET STACKING MODE AND LIMITS (03 04)
REPORT VERSIONS (0a)

This is the main menu of the interface

02H - Controller Global Settings

Offset	Parameter	Value
0	Firmware Vr.	511
1	Engg. Vr.	26
2	Station Count	99
3	Hours	23
4	Minutes	11
5	Seconds	37
6	Month	10
7	Day	15
8	Year	2019
9	Sys. Event Hour	0
10	RCP hour	0
11	DST (Active/Deactive)	0
12	ETAP Schedule	1
13	ETAP schedule length	3
14	Response level	2
15	Interval (seconds)	3
16	Mode	0
17	Remains Days	0
18	Global Seasonal Adjust	0
19	Stack	1
20	Max. programs running before Smart Stack	1
21	Max. programs running before SSG / Smart Stack	0
22	Rotary Knob	2

Example – Connect to Data objects to provide real time data for operators and logging purposes.

72H - Report Stations On

Offset	Parameter	Value	
69	Station1 On	1	●
70	Station2 On	1	●
71	Station3 On	0	●
72	Station4 On	0	●
73	Station5 On	0	●
74	Station6 On	1	●
75	Station7 On	1	●
76	Station8 On	0	●

7AH - Flow Totals

Rec	Today	Yesterday	Week - todate	Week - Prev	Month - todate	Month - Prev	Year - Todate	year - Prev
Ctrlr	0	0	0	0	0	0	0	0
SSG1	0	0	0	0	0	0	0	0
SSG2	0	0	0	0	0	0	0	0
Prog 0	0	0	0	0	0	0	0	0
prog 1	0	0	0	0	0	0	0	0
prog 2	0	0	0	0	0	0	0	0
Prog 3	0	0	0	0	0	0	0	0
Prog 4	0	0	0	0	0	0	0	0
Prog 5	0	0	0	0	0	0	0	0

List of Supported Commands and Services

A full description of each service and the data variables each service reads , writes is available in the driver manual.

Google = "FS-8705-41 Hunter Industries ACC2 Irrigation Controller.xlsx"

Striketrough = Not Supported

If the services is not in this list then it is not supported

Services supported for ACC2 firmware as shipped by Hunter in Jan2020

Services to support older ACC2 firmware - May be available on Request

Hunter_CMD / Services Supported
0x01 – SET FIELD CONTROLLER SYSTEM GLOBALS
0x02 – REPORT FIELD CONTROLLER GLOBALS
0x03 – SET STACKING MODE AND LIMITS
0x04 – REPORT STACKING MODE AND LIMITS
0x06 – Mute
0x07 - Reset Mute
0x0A – REPORT VERSIONS
0x0C – SET FLOW OPERATION PARAMETERS
0x0D – REPORT FLOW OPERATION PARAMETERS
0x0E – REPORT ITEM INFORMATION
0x10 – SET DECODER MODULE STATION ASSIGNMENTS (v2.00.016 and later)
0x12 – SET ITEM NAMES (v2.00.016 and later)
0x13 – SET STATION PARAMETERS
0x15 – REPORT DECODER MODULE STATION ASSIGNMENTS (v2.00.016 and later)
0x16 - Set Pump / Master Valve Param
0x17 – SET MAINSAFE PARAMETERS
0x18 – REPORT MAINSAFE PARAMETERS
0x19 – SET FLOW ZONE PARAMETERS
0x1A – REPORT FLOW ZONE PARAMETERS
0x1B – SET FLO+A694W SENSOR PARAMETERS (v2.00.033 and later)
0x1c– SET CLICK SENSOR PARAMS
0x1D – SET PROGRAM SENSOR ACTION

0x1E – SET FIELD CONTROLLER PROGRAM HEADER DATA (v2.13.000 and Later)
0x1F – SET FIELD CONTROLLER PROGRAM EVENT RUN TIME DATA
0x20 – SET RAIN DELAY VALUES
0x21 – GET RAIN DELAY VALUES
0x23 – SET SEASONAL ADJUST VALUES
0x24 – STOP STATIONS
0x25 – REPORT SEASONAL ADJUST VALUES
0x26 – STOP A PROGRAM
0x27 – DECODER INVENTORY
0x28 – PURGE LOG RECORDS
0x2B – REPORT FLOW ZONE MONITORING DATA
0x2C – REPORT FLOW ZONE DIAGNOSTIC DATA
0x2D – REPORT MAINSAFE MONITORING DATA
0x2E – REPORT FLOW MANAGEMENT FLOW DATA
0x2F – REPORT FLOW MANAGEMENT ACTIVE STATION DATA
0x30 – REPORT CONTROLLER CURRENT DRAWS (v2.00.016 and later)
0x32 – REPORT ITEM NAMES (v.2.00.016 and later)
0x33 – REPORT STATION PARAMETERS (v.2.00.016 and later)
0x34 – Report Block Parameters
0x35 – Stop Blocks
0x36 – REPORT PUMP/MASTER VALVE PARAMETERS (v2.11.007 and later)
0x37 – Reserved for Future
0x38 – SET LEARN FLOW START/STOP TIME
0x39 – GET LEARN FLOW STATUS INFO
0x3A – Get Learn Flow Report Info
0x3B – REPORT FLOW SENSOR PARAMETERS (v2.00.033 and Later)
0x3C – REPORT CLICK SENSOR PARAMETERS
0x3D – REPORT PROGRAM SENSOR ACTION
0x3E – REPORT FIELD CONTROLLER PROGRAM HEADER DATA (v2.13.000 and Later)
0x3F – Report Field Controller Program Event Run Time Data
0x40 – Set User Management Information
0x41 – Report User Management Information
0x42 – Set Calendar Days Off
0x43 – Get Calendar Days Off
0x4f – Report Item CRCs

0x51 – Stop Irrigation
0x51 – Stop Irrigation
0x52 – Programmable Off
0x53 – Suspend Irrigation
0x54 – Cancel Programmable Off
0x55 – Cancel Suspend
0x56 – Start Manual All Station Program
0x57 – Set System Event Mode
0x58 – Set FCP Mode
0x59 – Clear Field Controller Display Messages
0x5A – Set Pause Mode
0x5B – Cancel Pause Mode
0x5C – Start Single Manual Event
0x5D – Start Multiple Manual Events
0x5e - 0x71
0x72 – REPORT ACTIVE OUTPUTS (v2.00.025)
0x73 – REPORT ALARMS/INFORMATION
0x74 – REPORT LOG
0x75 – REPORT CURRENT FLOW DATA
0x76 – REPORT CLIK SENSOR INFORMATION
0x77 – REPORT DECODER MODULE INFORMATION (v2.00.024 and later)
0x7A – REPORT FLOW TOTALS
0x7B – REPORT FLOW DETAIL DATA
0x7C - Clear Flow Alarms
0x9A – GET CONTROLLER VERSION TYPE (v2.11.006 and later)

Client Server Model & Data Flow

Data flow is Bi Directional. The central station will be able to read and write parameters and issue commands.

The Gateway will be an active client in communications with the Hunter controller. This means that the gateway will issue messages to read/write data. The Hunter Controller ACC2 will be a passive server, waiting silently for messages from the gateway to which it will respond. The data read will be cached for serving via DNP3 to Cimplicity

A number of **data manipulation tools** such as the ability to scale values, perform arithmetic, logic operations, bit extraction, bit packing, conversion to / from Real and Integer types etc.

This data is shared with another protocol. For example DNP3 for the power industry, BACnet for the building automation industry. Any of the over 140 protocols available in the FieldServer library can be linked. More than 2 protocols can be used in the same gateway. You could share the irrigation data with Modbus and BACnet if required.

The 2nd protocol can be configured to be a server or a master or even both. So you can read Flow data and write it to another device using a protocol like Modbus. Or you can read the flow data and serve the data to a remote client using the 2nd protocol

Data Objects

An Excel spreadsheet is provided with the driver that contains a listing of all the services, the data objects used to monitor and command the controller. The following images provide samples from this spreadsheet. It contains notes on how to use the service and the meaning and use of each data object.

		BACnet Bv Grp10	BACnet Bi Grp1	BACnet Av Grp 40	BACnet Ai Grp30		Bacnet Object Type
	Green - Data sent to ACC Pink - Data read from ACC Data from ACC - Not available with DNP3 Data from ACC - only for DNP3	DNP3	DNP3	DNP3	DNP3	DNP3	DNP3 Object Type
		Modbus Coil	Modbus Bi	Modbus Holding	Modbus Input Reg		Modbus Data Type
		0x0000	10000	40000	30000		
		Add 1	Add 10001	Add 40001	Add 30001		
		10000	10000	10000	10000		

Data Array Offset	Payload item	Variable Data	Data Ty	Bo	Bi	Ao	Ai	Ai	
0	Trigger Write			0					Write to this point to trigger the command or configure command to write continuously
3	1	Hours	Byte			0			Hour time of day. Range is 0 to 23
4	2	Minutes	Byte			1			Minute of the hour. Range is 0 to 59
5	3	Seconds	Byte			2			Second of the minute. Range is 0 to 59
6	4	Month	Byte			3			Calendar month. Range is 1 to 12
7	5	Day	Byte			4			Calendar date. Range is 1 to 31
8	6	Year	UInt16			5			Calendar year. Range is 2005 to 2039
9	7	SysDChour	Byte			6			Value of System Event Day-Change hour. Range is 0 to 23
10	8	FcpDChour	Byte			7			Value of FCP Day-Change hour. Range is 0 to 23
11	9	options	Byte			8			Sets up global options for the controller. Bit values are as follows: bit 0: Set if in 24-hour mode
12	10	ourEtap	Byte			9			ETAP day of schedule. Range is 1 to 3
13	11	maxEtap	Byte			10			ETAP schedule length. Range is 1 to 3

Notes on how to use the service

Only use these columns for advanced configurations.

This is DNP3 - Group 10, Address 0
BACnet - BinaryValue(0)
Modbus - Coil 00001

Object Names

These are Ao Objects. The object number is provided. To get the Modbus register simply add 4000

Notes on how to use the object

B017 - Bit Counter BitOTen Object

This command is used to set the Bit Counter program. The program is used to count the number of times the bit is set in the program. The program is used to count the number of times the bit is set in the program. The program is used to count the number of times the bit is set in the program.

Param#	BitOTen	Sum	Hex	Mode	Ma	Min	Max
0	1	Toggle Counter	0	0	2	0	0
1	1	BitOTen	0	0	0	0	255
2	2	BitOTen	0	0	0	0	255
3	3	BitOTen	0	0	0	0	255

Made to the goal to toggle the command to set the counter. The program is used to count the number of times the bit is set in the program. The program is used to count the number of times the bit is set in the program. The program is used to count the number of times the bit is set in the program.

B018 - Bit Counter BitOTen Object

This command is used to set the Bit Counter program. The program is used to count the number of times the bit is set in the program. The program is used to count the number of times the bit is set in the program. The program is used to count the number of times the bit is set in the program.

Param#	BitOTen	Sum	Hex	Mode	Ma	Min	Max
0	1	Toggle Counter	0	0	4	0	0
1	1	BitOTen	0	0	0	0	255
2	2	BitOTen	0	0	0	0	255
3	3	BitOTen	0	0	0	0	255
4	4	BitOTen	0	0	0	0	255
5	5	BitOTen	0	0	0	0	255
6	6	BitOTen	0	0	0	0	255
7	7	BitOTen	0	0	0	0	255
8	8	BitOTen	0	0	0	0	255
9	9	BitOTen	0	0	0	0	255
10	10	BitOTen	0	0	0	0	255
11	11	BitOTen	0	0	0	0	255
12	12	BitOTen	0	0	0	0	255
13	13	BitOTen	0	0	0	0	255
14	14	BitOTen	0	0	0	0	255
15	15	BitOTen	0	0	0	0	255
16	16	BitOTen	0	0	0	0	255
17	17	BitOTen	0	0	0	0	255
18	18	BitOTen	0	0	0	0	255
19	19	BitOTen	0	0	0	0	255
20	20	BitOTen	0	0	0	0	255

Made to the goal to toggle the command to set the counter. The program is used to count the number of times the bit is set in the program. The program is used to count the number of times the bit is set in the program. The program is used to count the number of times the bit is set in the program.

B022 - Bit Counter BitOTen Object

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Param#	BitOTen	Sum	Hex	Mode	Ma	Min	Max
0	1	Toggle Counter	0	0	0	0	0
1	1	BitOTen	0	0	0	0	255

Made to the goal to toggle the command to set the counter. The program is used to count the number of times the bit is set in the program. The program is used to count the number of times the bit is set in the program. The program is used to count the number of times the bit is set in the program.

B024 - Bit Counter BitOTen Object

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Param#	BitOTen	Sum	Hex	Mode	Ma	Min	Max
0	1	Toggle Counter	0	0	0	0	0
1	1	BitOTen	0	0	0	0	255
2	2	BitOTen	0	0	0	0	255

Made to the goal to toggle the command to set the counter. The program is used to count the number of times the bit is set in the program. The program is used to count the number of times the bit is set in the program. The program is used to count the number of times the bit is set in the program.

B026 - Bit Counter BitOTen Object

This command is used to set the Bit Counter program. The program is used to count the number of times the bit is set in the program. The program is used to count the number of times the bit is set in the program. The program is used to count the number of times the bit is set in the program.

Param#	BitOTen	Sum	Hex	Mode	Ma	Min	Max
0	1	Toggle Counter	0	0	0	0	0
1	1	BitOTen	0	0	0	0	255
2	2	BitOTen	0	0	0	0	255

Made to the goal to toggle the command to set the counter. The program is used to count the number of times the bit is set in the program. The program is used to count the number of times the bit is set in the program. The program is used to count the number of times the bit is set in the program.

B028 - Bit Counter BitOTen Object

This command is used to set the Bit Counter program. The program is used to count the number of times the bit is set in the program. The program is used to count the number of times the bit is set in the program. The program is used to count the number of times the bit is set in the program.

Param#	BitOTen	Sum	Hex	Mode	Ma	Min	Max
0	1	Toggle Counter	0	0	0	0	0
1	1	BitOTen	0	0	0	0	255
2	2	BitOTen	0	0	0	0	255

Made to the goal to toggle the command to set the counter. The program is used to count the number of times the bit is set in the program. The program is used to count the number of times the bit is set in the program. The program is used to count the number of times the bit is set in the program.

Full list of services and objects is provided.
Green = Send to Controller
Pink = Read from Controller

Support

Please contact Chipkin Automation Systems directly for driver support.
 The following responses are supported.

Revision History

Date	Resp	Format	Driver Ver.	Doc. Rev.	Comment
2019Feb14	PMC		0.00	0	Released.
2019Oct22	PMC		9	1	Updated.