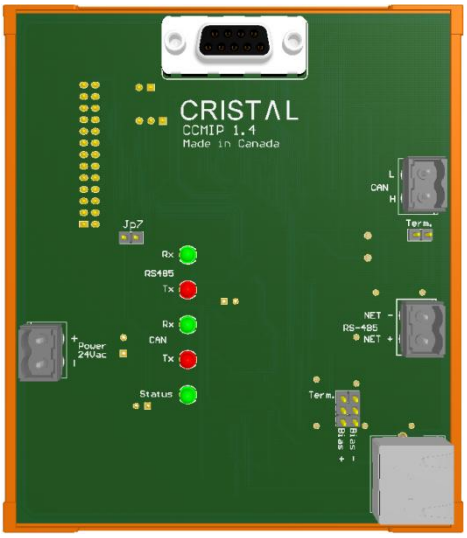
CRISTAL

CCLP-BACnet

(CCLP-1664 version 3.4.1)



2016-01-20

Martin Labbé, eng.

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1. Product description

The CCLP-BACnet is a communication card designed to interface up to 4 CCLS-4016 lighting controllers inside an electrical panel. It allows the CCLS-4016 to be visible from the BACnet protocol.

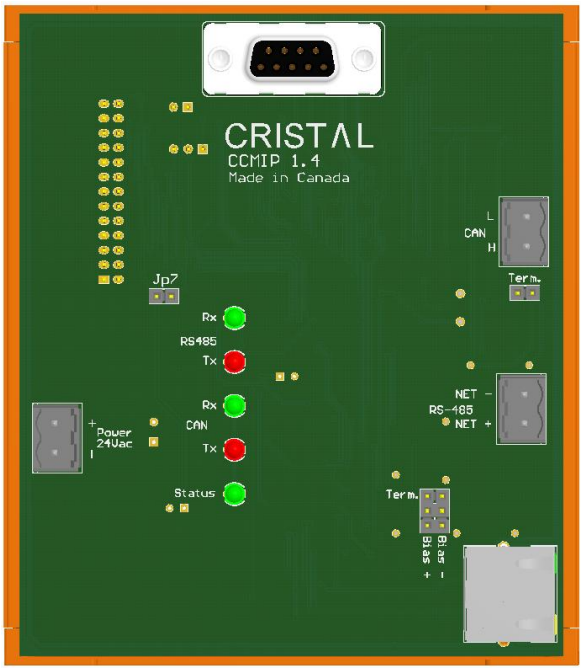

Figure 1 - PCB CCLP-BACnet

Basically, you control this electronic board from BACnet. You will discover this controller from a BACnet Building Controller (B-BC) or a BACnet Operator Workstation (B-OWS). It will allow accessing inputs (4.1) and relays (4.2) as any BACnet input or output. Also, relays can be grouped (4.3) to access multiple relays more efficiently. Finally, you can enable the gateway mode (4.4) on a few of these controllers when you need panel to panel communication without the need of a master controller.

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2. Typical wiring

Follow these guidelines if you install the electronic controllers by yourself as some wiring mistakes may damage the material.

2.1. Power Supply

The CCLP-BACnet controller and the CCLS-4016 I/O modules have half-wave power supplies. Each controller needs a 24 Vac supply and wiring polarity must be the same on each controller. We suggest connecting the “negative” side of the power supply to earth if you need to meet some standards (such as CSA) or to make sure the controllers have the same reference as other equipment.

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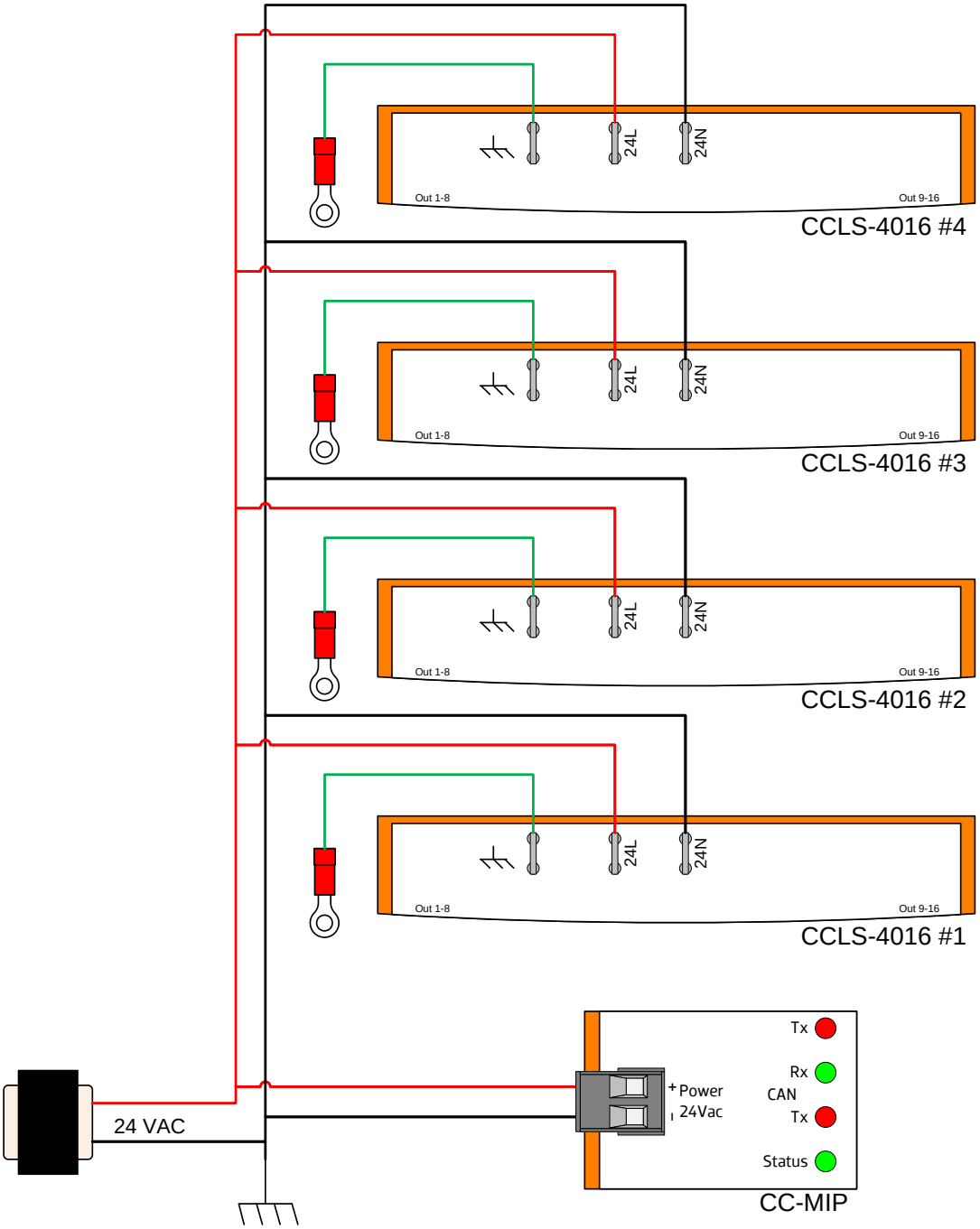

Figure 2 - Power supply wiring

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2.2. *Internal network (CAN)*

The BACnet communication card retrieves states and sends commands to the relay boards from a small network inside the lighting panel. This is a CAN network: it needs to have a "bus" topology and 124-Ω terminating resistors at each end. The network terminating resistor can be enabled by installing a jumper on the "Term" connector. Wiring polarity must be kept on each controller or no communication will result and it may even damage the controllers.

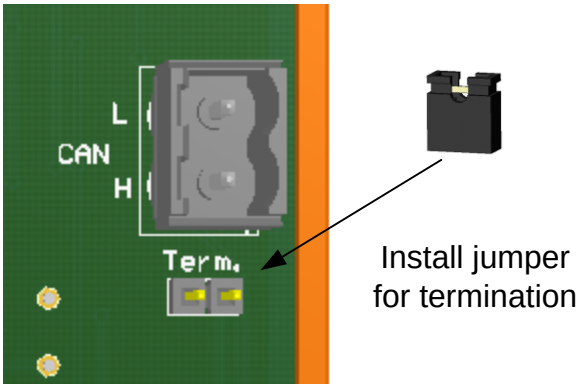

Figure 3 - CAN terminating resistor

This network cannot be extended outside the lighting panel as the extra length will decrease communication reliability.

Use proper low capacitance cable for network communication such as Anixter 316-023-1802-FR-05 or Cerco Cable AT-HOM29.

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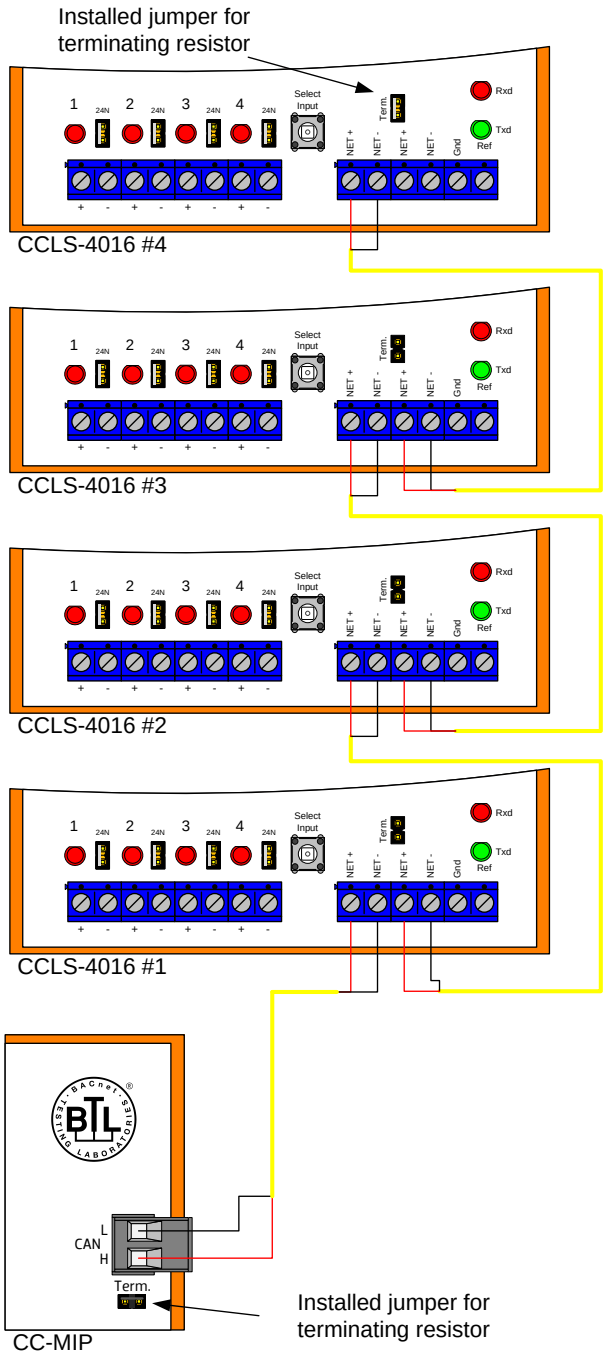

Figure 4 - CAN network wiring

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2.3. Ethernet IEEE 802.3

For BACnet-IP or BACnet Ethernet, the CCLP-BACnet uses a standard CAT-5 unshielded twisted pair cable with a RJ-45 type connector. This is a dual-speed network card with auto negotiation capabilities for any 10 BASE-T (10 Mbits) or 100 BASE-T (100 MBits) connections.

The auto negotiation procedure does not mix well on 1000 BASE-T (1000 MBits) connections. In this case, the speed of the CCLP-BACnet communication card, of the Network Interface Card when directly connected to a PC, or to an Ethernet switch needs to be forced at 100 MBits or at 10 MBits to operate properly or the Ethernet will not “link” and communication will fail.

Cable length should not exceed 100m (328 ft). If longer distances are needed, refer to a specialized network company to convert the network to alternative media such as fiber optic, DSL, or wireless.

2.4. RS-485 BACnet MSTP

See a few additional considerations when RS-485 MSTP network option is selected.

When the CCLP-BACnet is at the end of the RS-485 bus, we can use the on-board 120-Ω terminating resistors by installing “Term” jumper. 604-Ω biasing resistors may be enabled by installing jumpers “Bias A(+)” and “Bias B(-)”.

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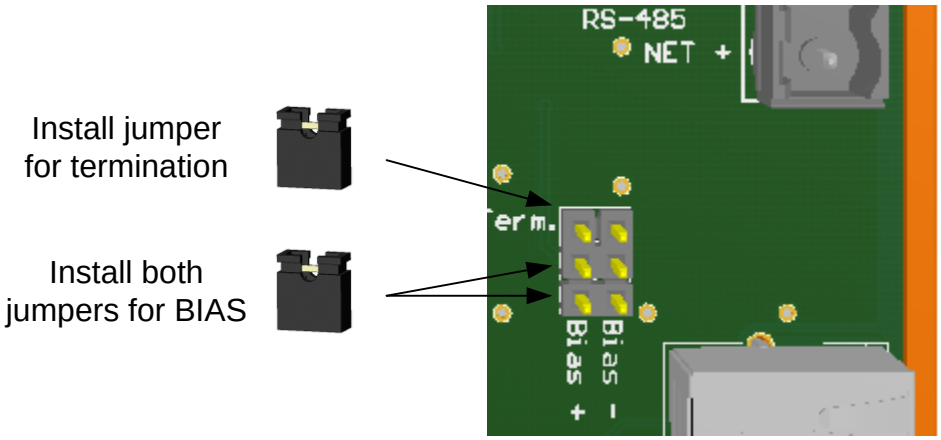

Figure 5 - RS-485 Bias and terminating resistor

For more information, refer to the Cristal Controls manual “Setting up a RS-485 Network”.

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3. Configuration console

The serial port of the CCLP-BACnet is used for most initial configuration of the device. You can connect to the serial port using a standard straight DB-9 male to DB-9 female serial cable. You can use HyperTerminal which is included in most Microsoft Windows installations. If this is not available, you can download the free PuTTY Terminal software or buy commercial software such as EmTec ZOC terminal.

Communication parameters need to be at 115200 baud, 8 bits of data, no parity and 1 stop bit. The computer needs to drive the DTR pin or the controller will ignore any serial port communication.

```
CCLP-1664-BIP 1.0 Compiled on Jun 20 2008 14:33:48
Copyrights Cristal Controls Ltd.

OpenTcp stack v1.5.2
MAC Address:  00:50:C2:90:70:03
IP Address:   192.168.2.35
Subnet Mask:  255.255.255.0
Gateway:      192.168.2.1

BACnet stack v0.4.4.1
Broadcast: C0A802FFBAC0
Address: C0A8025DBAC0
BACnet stack running...
```

On the device power up, you should see a lot of information about: software version, IP, and BACnet configuration. You are now ready to configure and diagnose your CCLP-BACnet device.

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3.1. Various commands

Help

This command will display the list of commands with some information about syntax and usage.

Show

This command displays information about IP configuration, BACnet configuration, and the hardware installed.

```
OpenTcp stack v1.5.2
MAC Address:  00:50:C2:90:70:03
IP Address:   192.168.2.35
Subnet Mask:  255.255.255.0
Gateway:      192.168.2.1

BACnet stack v0.4.4.1
Broadcast: C0A802FFBAC0
Address: C0A80223BAC0

DEVICE ID BACNET: 35
APDU TIMEOUT: 3000
APDU RETRIES: 3
DEVICE NAME: CCLP-1664

Microcontroler: MCF52234
Flash chip: ST M25PE40 4Mbit
Ethernet Speed: Auto(100F)
```

With the last line, you can diagnose your Ethernet connection. It will display the speed of your Ethernet link if it is up.

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Version

Displays version information about your CCLP-BACnet and your CCLS-4016.

```
CCLP-1664-BIP 1.0 Compiled on Jun 20 2008 14:33:48
Copyrights Cristal Controls Ltd.

Device #1: 2.003
```

Reboot

This command resets the CPU and restarts the program.

3.2. Ethernet and IP

IP

This command allows the IP address change of the CCLP-BACnet or enables the usage of a DHCP server. Follow this command with the needed IP address or the text dhcp.

```
ip 192.168.2.35
```

```
ip dhcp
```

After setting the IP address, you will be reminded to “Reboot” the device to allow the changes to take effect.

WARNING: Using the DHCP server should be enabled only in test environment. In case of a DHCP server failure, the lighting controller may become unreachable.

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Gateway

This command allows changing the address of the default gateway. Follow this command with the needed IP address. Usually, this is the IP address of your internet router.

```
gateway 192.168.2.1
```

Subnet

This command allows changing the address subnet mask for your device. Follow this command with the needed IP mask. You should set all devices and computers to the same value when on the same network.

```
subnet 255.255.255.0
```

EthSpeed

With this command you may force the speed to your Ethernet controller. Follow this command with “10F”, “10H”, “100F”, “100H”, or “Auto”, depending on if you want to force 10 MBits, 100 MBits, full-duplex, half-duplex, or automatic mode. It is safe to leave it to “Auto” but you may need to force the speed if connected to a 1 GB Ethernet device as there are some known incompatibility being “Auto” on a 1 GB link.

Ping

Allows you to ping another device on the IP network. Follow this command with the IP address of your destination. This command can be useful while doing diagnostics on IP network.

```
ping 192.168.2.10
Ping request sent
```

```
Ping reply received from 192.168.2.10
```

FecStats

This command shows various statistics of the Ethernet controller. You may use those different counters to diagnose the quality of your Ethernet connectivity.

3.3. BACnet

WARNING: A misuse of these parameters can cause network communication problems for this CCLP-BACnet board and to other devices. Consult your BACnet network administrator about accurate parameters to configure.

DeviceName

This is the name of your BACnet device object. This is used by most installation tools to identify your device. Follow this command with the new device name you want to use. You may enter any string up to 31 characters.

Nameprefix

Using this command followed by “on” or “off”, enables or disables the device name as a prefix to any BACnet object name in the controller. Using this prefix allows easier object identification from the network.

DeviceId

This command allows adjusting the BACnet device ID. This number must be unique on the whole BACnet network and must be included between 0 and 4194302. Follow this command with a decimal number for the new device ID you want to use.

ApduTimeout

The APDU_Timeout indicates the time in milliseconds between retransmissions of a message for which no acknowledgment has been received. It is recommended that this value should contain the same value for all intercommunication devices.

ApduRetries

The Number_Of_APDU_Retries indicates the maximum number of times a message shall be retransmitted.

MstpBaud

This command allows adjusting RS-485 serial communication speed. Follow this command with the desired baud rate. The possible values are 9600, 19200, 38400, 57600, 76800, 115200, and 230400. The default value is 38400 baud and this must match all other devices on the same RS-485 network.

MstpMac

This command allows changing the address used on the RS-485 twisted pair network. Follow this command with a hexadecimal number from 00 to FE for the new MAC you want to use. This address must be unique for all devices connected on the same RS-485 network segment.

MstpMaxFrame

This command allows adjusting the maximum number of messages sent by the device before passing the token to another MSTP device. Follow this command with the desired number of messages. Possible values are between 1 and 32. Usually this value is 1. Increasing this value will allow this device to communicate more often than the others.

MstpMaxMaster

This command allows adjusting the maximum master searched by the MSTP protocol. Follow this command with a decimal number from 0 to 127 for the Max Master you want to use.

The default value is 127; this can be decreased according to the device with the highest address to optimize search time from MSTP protocol.

MstpStats

This command may be available on special firmware built of the CCLP-BACnet. It will display various MSTP statistics and may help to diagnose some problems.

WhoIs

Explicitly broadcasts a “Who-Is” command on the BACnet network. Other devices receiving this message should respond with an “I-Am” message. This can help to diagnose what other BACnet devices this one can reach.

```
whois
Sending WhoIs...
OK
Received I-Am Request from 999!
Received I-Am Request from 4!
Received I-Am Request from 1000!
```

Note: You don’t need to send the “Who-Is” command to receive the “I-Am” messages. The “I-Am” messages received will be displayed at any time.

IAm

Explicitly broadcasts an “I-Am” command on the BACnet network.

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UDPPort

This parameter allows the configuration of the UDP port used for BACnet-IP communication. Follow this command with a decimal number from 0 to 65535 as the new desired port. Restart the controller after any change to this configuration.

BBMD

This parameter allows the configuration of the needed options to allow the controller to register to a BBMD server (« Bacnet Broadcast Management Device »). Follow this command with the IP address of a BBMD, its UDP port and the time to live interval of the registration in seconds. To disable registration to a BBMD server set the interval to 0 seconds.

```
BBMD 192.168.2.249 47808 3600
OK
```

BBMDRetry

This parameter sets a shorter delay for BBMD registration retry when server is not responding. It allows a tradeoff between network bandwidth and time connecting to the BBMD server. The default value is 60 seconds.

```
BBMDRetry 60
OK
```

3.4. CAN

CanGateway

When multiple CCLP-BACnet controllers are tied together and you want an input state to be sent to other lighting panels, you can enable the “Gateway” mode. This will allow the messages inside the panel to be sent to other CCLP-BACnet panels without the need of a master controller.

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Syntax for this command is “cangateway” followed by “on”, “off” or a network number. You can also write “cangateway” alone to read the current mode of this configuration.

```
cangateway
CAN Gateway disabled
```

This parameter can also be changed through a BACnet object (4.4).

Due to performance reasons this command is not available with MS/TP controllers.

Redetect

This command forces the detection sequence for the CCLS-4016 boards on the CAN network. This is normally done during manufacturing and this is automatically done on power-up if no CCLS-4016 CAN addresses are defined yet for this controller. This command will overwrite CCLS addresses in BACnet objects (4.5).

ShowCcls

This command displays an ASCII text file which allows reading firmware version information about the CCLP-BACnet and the CCLS-4016 cards. Also tells if some errors are detected from CCLS-4016 communication.

See BACnet file (4.6) “SystemInfo.txt” for more details.

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ClearLog

This controller has the ability to record all CCLS-4016 events as seen on the CAN network. You can wipe all events and restart with an empty log by sending this command.

LogCan

You can control what type of CCLS-4016 events will be recorded to the flash memory of this controller. By avoiding some type of information you can record other information for a longer period of time. Contact Cristal Controls if you need to use the logging capability of this controller. By default, no message is being logged.

The recorded log can be retrieved by the use of BACnet files (4.6).

3.5. Lighting panel

Status

This command returns relay and input status of the whole panel.

Each relay is displayed with a single character. It can be '1' for ON, '0' for OFF, '2' for both ON and OFF state return, 'F' for a faulty output without any state return, or 'X' when the CCLS-4016 is not present.

Each input is displayed with a single character. It can be '1' for ON, '0' for OFF, or 'X' when the CCLS-4016 is not present.

```
status
Relay Status
0        1         2         3         4         5         6
12345678901234567890123456789012345678901234567890123456789012345678901234
01112011FFFFFFFFXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
Input Status
0        1
1234567890123456
0000XXXXXXXXXXXX
```

Relay

This command allows sending some commands to the relays. It may allow checking proper communication between the CCLP-BACnet and the appropriate CCLS-4016. Follow this command with a relay number from 1 to 64 and the action “on”, “off”, or “flick”. Sending a “flick” command activates the unoccupied mode (see section 4.2 Relays for more details).

```
relay 1 on
OK
relay 2 off
OK
relay 3 flick
OK
```

Group

This command has some sub-commands to alter the groups’ (4.3) configurations. It can also be changed from the configuration file (4.6) “GroupCfg.bin”. For every command following, [group number] is from 1 to 8 and [relay number] is from 1 to 64.

To add a relay in a group, type “group [group number] add [relay number]”.

```
group 1 add 1
```

To remove a relay from a group, type “group [group number] del [relay number]”.

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```
group 1 del 1
```

To remove all relays from a group, type “group [group number] clear”.

```
group 1 clear
```

To see the relay list inside a group, type “group [group number] print”.

```
group 1 print
Relay(s) in group #1:  1 2 3 4
OK
```

When done configuring groups, some information has to be sent to the CCLS-4016 boards. Type “group commit” to do so.

```
Type group commit to apply changes
OK
group commit
OK
```

MasterCtrl

This command has a few sub-commands to change the configuration from a master controller. When a master controller is configured, we monitor if communication with this master controller is maintained. When the communication is lost, we disable the schedule mode and apply command on the desired relays. Sub-commands follow.

- deviceid : configure the Device Id of the master controller. When this value is zero (0), master controller monitoring is disabled.

```
masterctrl deviceid 1000200
OK
```


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- initdelay : configure the used delay after a reset of the CCLP-1664. This delay can be used to give more time to the master controller after a power loss. When this delay times out, a « WhoIs » message is sent with the master controller « Device Id » to learn its address. We then grant another time this « initdelay » waiting for an answer from the master controller. If we do not receive an answer after this second delay, we then consider we have a communication problem.

```
masterctrl initdelay 300
OK
```

- delay : configure the inactivity delay for communication with the master controller after the initial message has been received from it.

```
masterctrl delay 3600
OK
```

- add/del on/off #relay: indicates if ON or OFF command must be applied after a communication with the master controller is lost. The « del » command deletes the relay from the ON or OFF list. A relay cannot be on both lists at the same time; when adding a relay to the ON list, it is automatically deleted from the OFF list and vice versa.

```
masterctrl add on 10
OK
```

- del on/off #relay: removes a relay from the list of those needed to be turned ON or OFF when communication is lost with the master controller.

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```
masterctrl add on 10
OK
```

- print on/off : display relays from the selected list.

```
masterctrl print on
Relay(s) ON :  1 2 3 5 16 32
OK
```

- clear on/off : empty the relays list from the indicated list.

```
masterctrl clear on
OK
```


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4. Communication – BACnet objects

Following is the BACnet objects list.

Object	Instance	Name	Min Value	Max Value	Default	Description
Device		CCLP-1664	0	4194302		
BI	0-15	INPUT 01-16	0 = OFF	1 = ON	0 = OFF	Current state of the programmable inputs.
BI	16-79	RELAY FB 01-64	0 = OFF	1 = ON	0 = OFF	Actual state of a relay.
BO	0-63	RELAY CMD 01-64	0 = OFF	1 = ON	0 = OFF	Send a command to a relay.
BO	64-127	RELAY FLK 01-64	0 = OFF	1 = ON	0 = OFF	Send a flick warning command to a relay.
BV	0-7	GROUP CMD 01-08	0 = OFF	1 = ON	0 = OFF	Send command to multiple relays.
BV	8-15	GROUP FLK 01-08	0 = OFF	1 = ON	0 = OFF	Send a flick warning command to multiple relays.
AV	0-7	GROUP FB 01-07	0.0%	100.0%	0.0%	Feedback for the relays of a group. 0% = OFF, 100% = ON, other = mixed.
AV	8-11	CCLS ADDR 01-04	1	127	Auto	Can address of CCLS-4016 I/O boards.
AV	12	CAN GATEWAY	-1	254	-1	Enable CCLS-4016 communication across panels. -1 = Disabled 0 = Enabled without a network number 1 - 254 = Enabled with the specified network number
FILE	0	FILE 0				Group configuration
FILE	1	FILE 1				System version info
FILE	2	FILE 2				Lighting event logger

Following is the BACnet proprietary properties list.

Object	Instance	Property Identifier	Data Type	Name	Minimum Value	Maximum Value	Default	Description
Device		512	Unsigned	MAC ADDRESS	0	254	21	MSTP MAC Address.
BV	0-7	530	Unsigned / NULL	GROUP TIMEOUT	5	1 270	0 = Disabled	Group timeout delay in minutes. Increments of 5 minutes.

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BV	0-7	531	Unsigned / NULL	GROUP FLK WARN	10	2 540	0 = Disabled	Group flick warning in seconds. Increments of 10 seconds.
BV	0-7	532	ENUMERATED	GROUP CMD ALLOWED			3 = ON_OFF	Group allowed command configuration. DISABLE = 0 OFF = 1 ON = 2 ON_OFF = 3 INVERT = 4 OFF_INVERT = 5 ON_INVERT = 6 ON_OFF_INVERT = 7
BV	0-7	533	BIT STRING	GROUP RELAY			{}	Relays in the group.
BI	0-15	532	ENUMERATED	INPUT CMD ALLOWED	0	3	3	Temporary disable input commands. This will return to the default value when the CCLS-4016 reboot. 0 = Commands disabled 1 = OFF enabled 2 = ON enabled 3 = OFF and ON enabled

4.1. Inputs

Inputs from CCLS-4016 boards can be read from binary inputs “Input 01” to “Input 16”. The property “Present_Value” returns the state of an input: 1 for “ON” or 0 for “OFF”. The property “Reliability” should usually return “NO_FAULT_DETECTED” during normal use. If a CCLS-4016 card is not present, it will return “NO_SENSOR”. It may also return “UNRELIABLE_OTHER” when not initialized during power-up.

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4.2. Relays

You may access each relay with three different objects.

Binary outputs “Relay Cmd 01” to “Relay Cmd 64” allows changing the state of the relays. By writing the “Present_Value” property, a command will be issued to the physical relay in the panel controller. You may read the actual feed-back of the relay by reading the “Feedback_Value” property. The property “Reliability” should usually return “NO_FAULT_DETECTED” during normal use. If a CCLS-4016 card is not present, it will return “NO_OUTPUT”. When a card is present but no relays are connected, it will return “OPEN_LOOP”. When the card detects an output with both positive and negative feed-backs, it will return “SHORTED_LOOP”. It may also return “UNRELIABLE_OTHER” when not initialized during power-up.

Binary inputs “Relay Fb 01” to “Relay Fb 64” allows reading the state of the relays from the standard “Present_Value” property. This is the same reading as the optional “Feedback_Value” property above. The property “Reliability” should usually return “NO_FAULT_DETECTED” during normal use. If a CCLS-4016 card is not present, it will return “NO_SENSOR”. When a card is present but no relays are connected, it will return “OPEN_LOOP”. When the card detects an output with both positive and negative feed-backs, it will return “SHORTED_LOOP”. It may also return “UNRELIABLE_OTHER” when not initialized during power-up.

Binary outputs “Relay Flk 01” to “Relay Flk 64” allows sending flick warning commands on the relays and modify the occupancy mode of the relays when the relay’s configuration allow it for the selected relay. Writing the “Present_Value”

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property to 1 will activate the unoccupied mode. When activating the unoccupied mode a flick warning sequence is sent to the relay when it's in ON state. No flick-warn sequence is sent when the relay is already in OFF state. The warning sequence will issue an OFF command on the relay followed by an ON command one second later.

In unoccupied mode, a counter is activated when the relay is turned ON and the relay will automatically turn OFF after the configured Timeout delay. When a Flick Warn delay is configured, a flick warning sequence is made and the relay will turn OFF definitively after the Flick Warn delay. During the Flick Warn delay, the relay's state can be manually changed (make an OFF command followed by an ON command) so the relay will stay in ON state for another Timeout delay.

Writing the "Present_Value" property to 0 will activate the occupied mode. The relay won't change state on the writing and will change state only on command.

When a master controller is configured, we check that communication with it is still active. Time is measured since last message was received from master controller. When time is greater than inactivity configuration, every relays go back to occupied mode.

The property "Reliability" behaves like the "Relay Cmd XX" objects above.

4.3. Groups

You may access each groups of relays with three different objects. Up to 8 software groups can be created to access multiple relays at the same time. Group configuration can be uploaded to file objects (4.6) or from the console (3.5). Group commands can also affect the schedule mode.

Binary values “Group Cmd 01” to “Group Cmd 08” allow changing the state of many relays in a group and control the occupied and unoccupied modes. By writing the “Present_Value” property, a command will be issued to all the relays in this group. The type of command that can be sent to the group can also be limited to OFF only, ON only or both commands can be disabled.

Analog values “Group Fb 01” to “Group Fb 08” allow reading the state of the relays from the “Present_Value” property. When all relays are OFF, “Present_Value” will be 0.0%. When all relays are ON, “Present_Value” will be 100%. When some relays are ON and some are OFF, “Present_Value” will return the percentage of relays in the ON state. The property “Reliability” should usually return “NO_FAULT_DETECTED” during normal use. When not initialized during power-up or if any fault is active for the relay, it will return “UNRELIABLE_OTHER”.

Binary values “Group Flk 01” to “Group Flk 08” allow sending flick warning commands on multiple relays. Writing the “Present_Value” property to 0 has no effect on the relays but writing a 1 will issue a warning sequence on the relay. If the relay is already OFF, the warning sequence has no effect. If the relay is ON, the warning sequence will issue an OFF command on the relay followed by an ON command one second later.

An occupancy mode can be configured for each group. When sending an ON command though the “Group Cmd” object, the ON command is sent to the group and the occupied mode is activated for relays members of the group. When sending an OFF command, the OFF command is sent to the group and the unoccupied mode is activated for relays members of the group. In unoccupied

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mode, a counter is activated when a relay is turned ON and the relay will automatically turn OFF after the configured Timeout delay of the group. When a Flick Warn delay is configured for the group, a flick warning sequence is made and the relay will turn OFF definitively after the Flick Warn delay. During the Flick Warn delay, the relay's state can be manually changed (make an OFF command followed by an ON command) so the relay will stay in ON state for another Timeout delay.

When sending a Flick command by writing "1" in the "Present_Value" property of the "Group Flk" object, a flick warning sequence is sent to relays that are members of the group and are in ON state. The relays will be turned OFF definitively after the FlickWarn delay configured for the group (if the FlickWarn delay configured is zero the relay will turn OFF without a flick warning sequence). The unoccupied mode is also activated for all relays member of the group. When writing "0" the occupied mode is activated for the relays member of the group; no command is sent.

4.4. Gateway

When multiple CCLP-BACnet controllers are tied together and you want an input state to be sent to other lighting panels, you can enable the "Gateway" mode. This will allow the messages inside the panel to be sent to other CCLP-BACnet panels without the need of a master controller.

The cards with the same CAN Gateway number can communicate together. The messages from a card with the CAN Gateway enabled but without a network number are visible to all cards with or without a CAN Gateway number. The default value is "-1 / disabled".

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This is saved in an eeprom non-volatile memory. It can also be changed from the console (0).

For controllers with the MS/TP network option, this object is read only.

4.5. CCLS-4016 Addresses

Basically the analog values “CCLS Addr 01” to “CCLS Addr 04” should match with the addresses displayed from the CCLS-4016 boot sequence for appropriate communication inside the panel.

These values should be used mainly for troubleshooting purposes as they should be auto-detected during panel manufacturing. You may need to write the CCLS-4016 CAN addresses into these objects when replacing hardware or you may launch the auto-detection sequence from the console (0). Those values are saved to eeprom non-volatile memory.

When using the gateway mode, if a CAN address is detected more than once on the network, the “Realibility” property will report “RELIABILITY_COMMUNICATION_FAILURE” on the corresponding object to warn about this problem. A message will be displayed on the configuration console the first time this problem is detected. This message will help the identification of the second CCLP-BACnet with this problem. After that, a reminder will be displayed each time a command is entered on the console.

4.6. Files

GroupCfg.bin (File 0)
This binary file holds the group configuration.

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SystemInfo.txt (File 1)

This file is an ASCII text file which allows to read firmware version information about the CCLP-BACnet and the CCLS-4016 cards. This helps troubleshoot procedures and considers if upgrading is necessary. Following is an example with some explanations of the meaning for each text.

```
CCLP-1664-BIP
V1.0

Device #1
CCLS4016-CAN
1
2.003
0x01
0x20E3

Device #2
CCLS4016-CAN
2
2.003
0x01
0x20E3
```

The first two lines are the name of the firmware inside the CCLP-BACnet controller and its version number. This can be followed by up to 4 text blocks, one for each CCLS-4016 inside the panel.

Each block is identical and has 6 lines of text. First line has the text “Device” followed by a number from 1 to 4. The other lines have respectively the name of the firmware in the controller, its CAN address, the firmware version, the version of the format of the configuration file (should be 0x01) and, finally, a checksum calculation on the configuration file of the controller.

LogCCLS.bin (File 2)

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This binary file allows retrieving a chronological list of actions and changes of status that happened inside the panel. In the future, a tool will be available to extract this information and save it to a standard database.

BackupRestoreFile.bin (File 3)

This binary file allows reading and writing to the CCLS-4016 linked to the CCLP-1664 card by the « BACnet Browser » software. WARNING: It is strongly suggested to avoid writing to this file manually. The use of the “BACnet Browser” software is preferred to modify the CCLP-1664 configuration.

CCLPCfg.bin (File 4)

This binary file allows reading the CCLP-1664 card’s configuration. This configuration includes device name and device id configuration, individual relay Timeout and FlickWarn configuration. WARNING: It is strongly suggested to avoid writing this file manually. The use of the “BACnet Browser” software is preferred to modify the CCLP-1664 configuration.

4.7. CCLS-4016 adresses discovery

CCLS-4016 addresses discovery can be restarted from the BACnet network. Use the “reinitiaze device” BACnet service with the “Cold Start” mode. Using this mode, the controller will not restart, but it will launch the CCLS-4016 discovery in the same way as using the « redetect » command from the configuration console.

4.8. Master Controller

When a master controller is communicating with the CCLP-1664, we can configure an inactivity delay to validate that this master controller is still in

service. When this delay expires, the off-schedule mode for all relays is disabled. “ON” and “OFF” commands can also be applied on the relays.

Two delays are being used: the first one after the CCLP-1664 startup and the other one after initial communication has been established. We use a different delay on startups to let the master controller start and be ready for communication. When this initial delay expires, a “WhoIs” with the master controller « Device Id » is sent to learn its MAC address. The master controller has the same delay to answer with an “I-am” message. After we received a message from the master controller, the second delay is used.

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5. Web Interface

The CCLP-BACnet controller has a tiny web interface you can use to do a few diagnostics. Simply type the IP address of your controller into your favorite web browser.

If you select “Panel” from the top menu, you will see a large page showing all inputs and relays in the panel. It may help in troubleshooting a few communication problems.

Each color beside a relay or an input will tell you its current status.

Green		The input or relay is OFF.
Red		The input or relay is ON.
Pink		There is a fault with the relay as the CCLS-4016 detect both ON and OFF feedback signals.
Black		There is a fault with the relay as the CCLS-4016 cannot detect an ON or OFF feedback signal.
Gray		There is no communication with the controller or the controller is not installed.

The panel web interface has a JavaScript to automatically refresh is state every 5 seconds.

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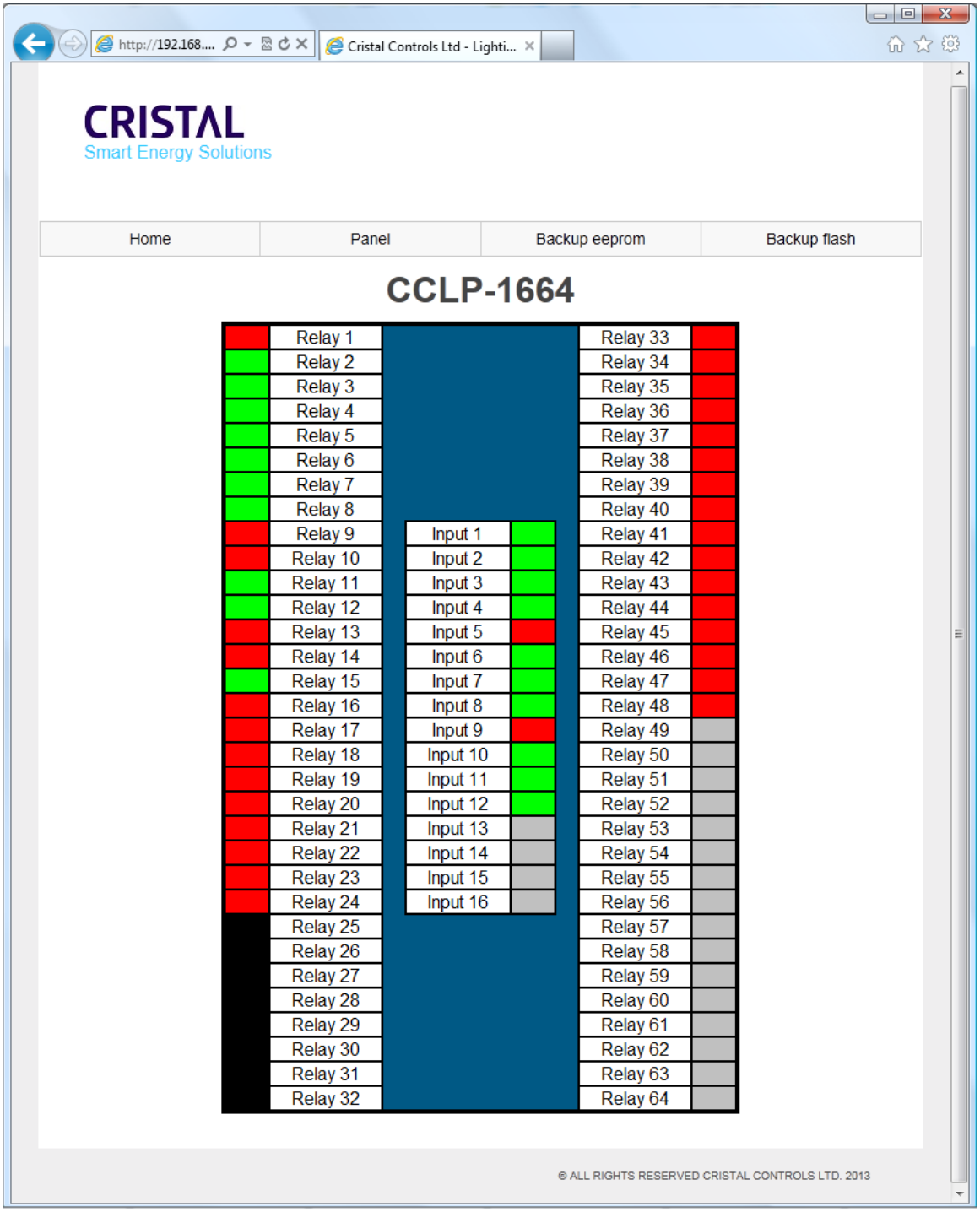

Figure 6 - Web panel interface

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6. Hardware specifications

- Microcontroller : Freescale MCF52235
- Communication : Ethernet, Tcp-Ip, Can, and a choice of BACnet Ethernet, BACnet-IP or BACnet MSTP.
- Supply : 18-30 Vac Half wave
- Power supply : 175 mA typical, 200 mA max
- Operating temperature : 0ºC à 50ºC (32ºF à 122ºF)
- Storage temperature : -20ºC à 70ºC (-4ºF à 158ºF)
- eeprom configuration storage : 512 bytes, 1 000 000 write cycles
- flash memory log storage : 512 kbytes, 100 000 write cycles

6.1. Leds

The “Status” led (LED3) should blink at 1 Hz when the CCLP-BACnet is operating properly. Other leds show communication activity respectively for RS-485, CAN, and Ethernet.

6.2. Dip switches

Dip switches are reserved for a future use.

6.3. Jumpers

Beside the CAN terminals, the jumper “Term.” can enable or disable the 124-Ω terminating resistor.

Beside the RS-485 terminal, the jumper “Term.” can enable or disable the 120-Ω terminating resistor. Also, the jumpers “Bias A(+)” and “Bias B(-)” can enable or disable the biasing resistors.

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6.4. Dimensions

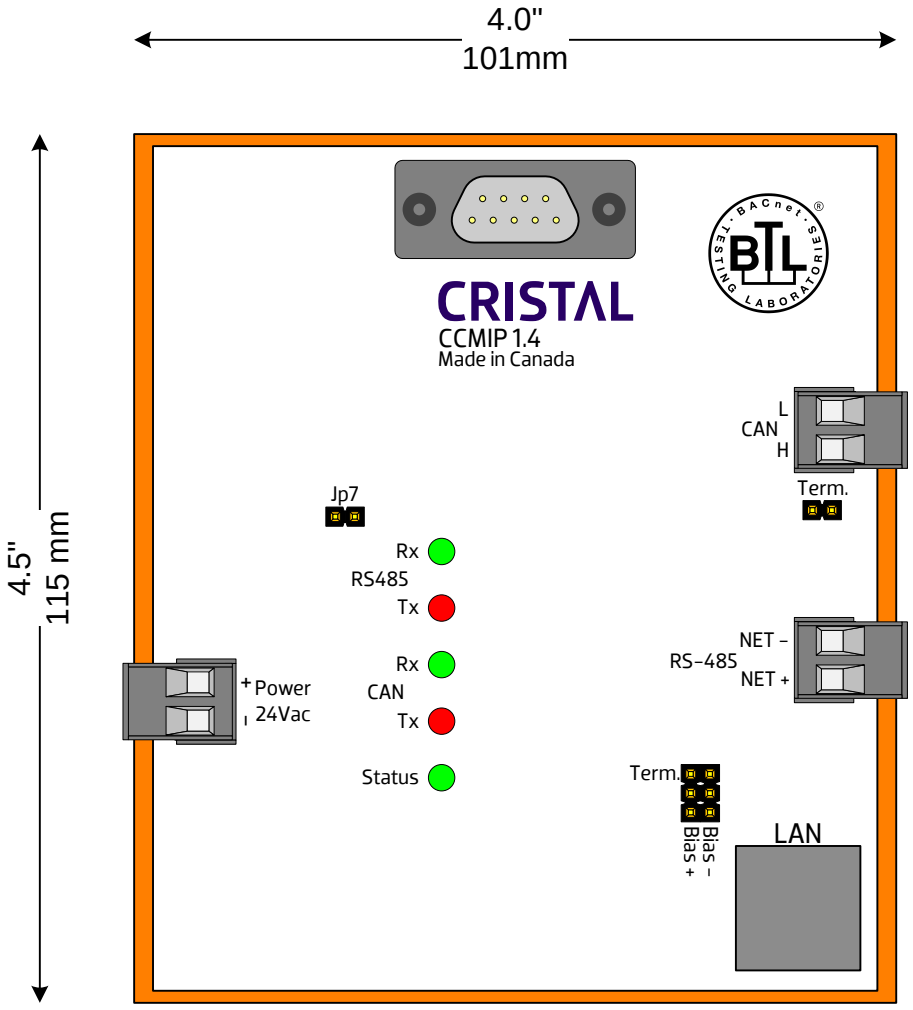

Figure 7 - Dimensions

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