HMI SYSTEMS

CANconnect

User's Manual

Rev 3.1

05-22-2018

CANconnect User's Manual

Index

Chapter 1 - Installation

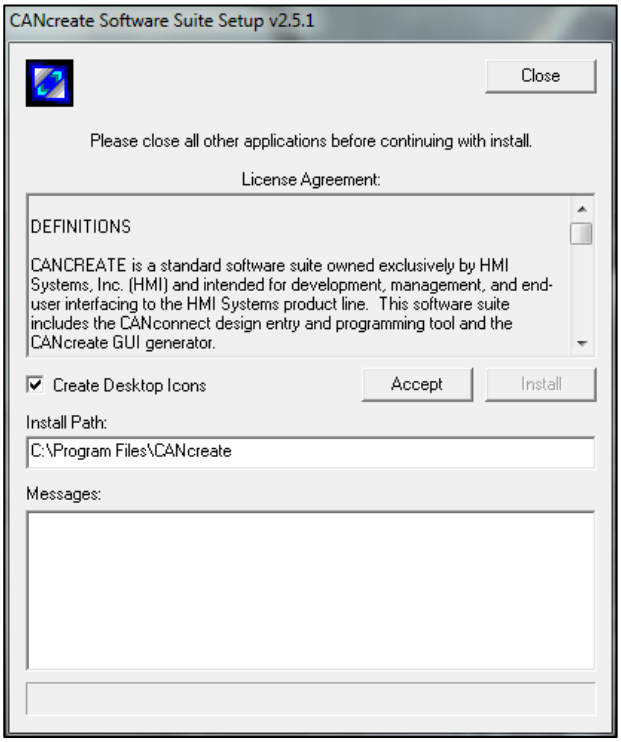
1.1 Windows XP/7/10

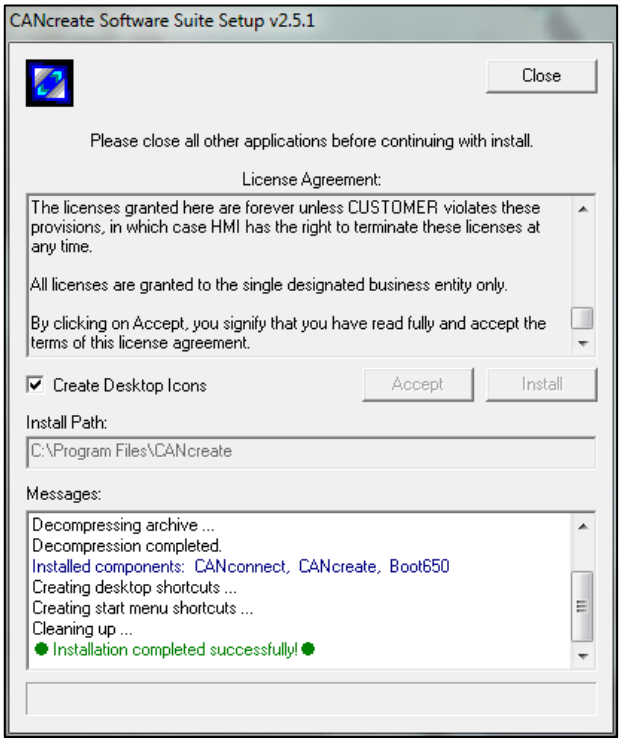
Locate the CANconnect installation file you received from HMI Systems. Follow the steps below to install the software onto your computer.

1. Locate and double click the "setup.exe" file to start the installation. If asked by Windows to allow the file to continue, click "yes."

2. The CANcreate Software Suite window will load. Read the License Agreement and click "Accept." Choose an install path and click "Install."

3. When finished installing, the message "Installation completed successfully!" will show in the Messages window. Locate the CANconnect icon on your desktop to launch the software.





1.2 USB Connection

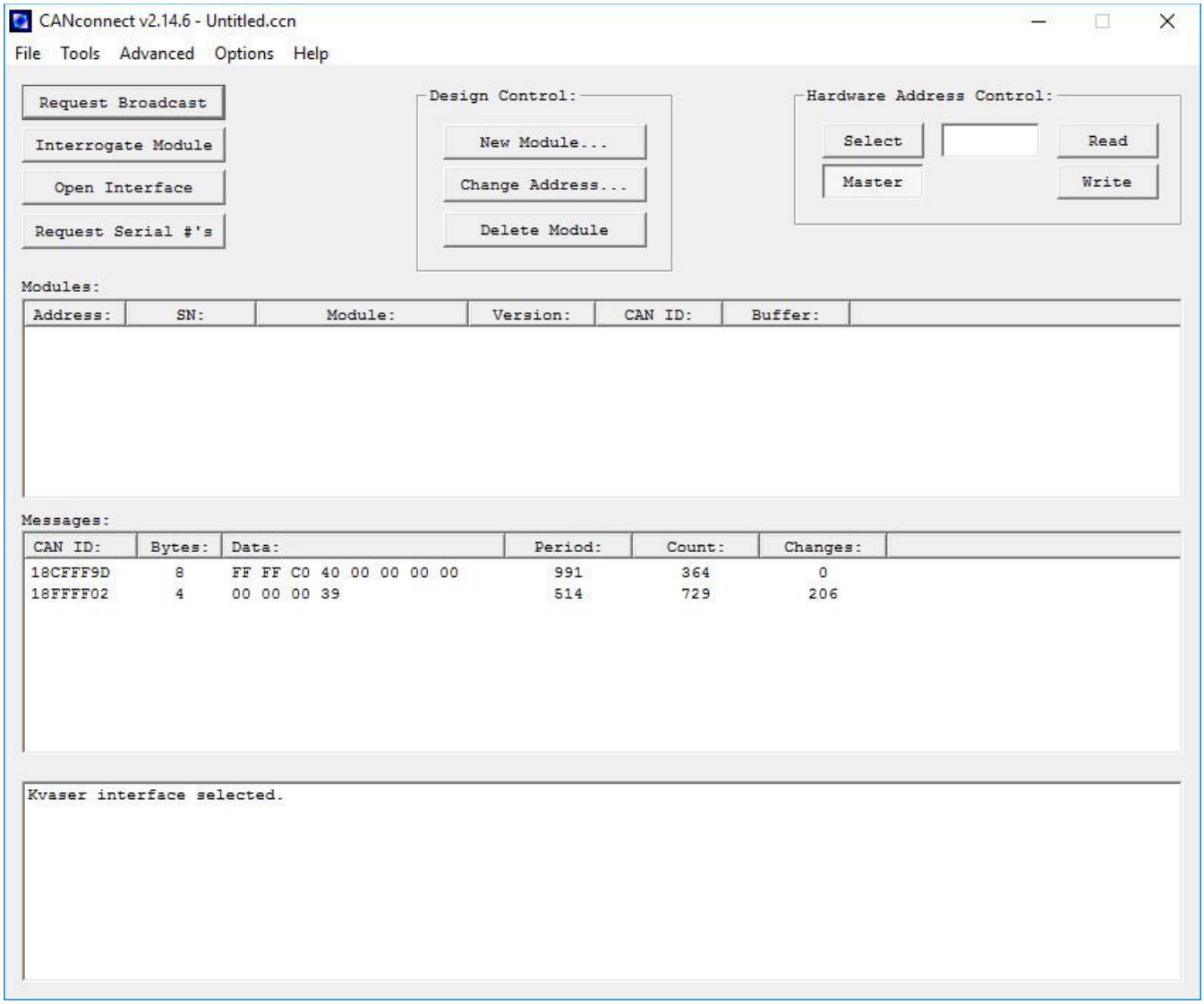
The CANconnect software requires a CAN to USB adapter to communicate with any connected modules. Supported adapters include the 514UTC, 615UTC, and the PCAN Gridconnect.

514UTC/615UTC Adapter

PCAN Gridconnect Adapter

Chapter 2 - Interface

2.1 CANconnect Main Window



This is the main CANconnect window. Through it, all USB connected modules may be monitored and edited through separate interfaces. The various components of the workspace are detailed in this chapter.

2.2 Main Window Toolbar

File

New - Open a new .ccn file.

Open… - Open a previously created .ccn file.

Save - Save the current .ccn file.

Save As… - Save the current .ccn to a specified location.

Recent File - Open recently used files.

Close - Close CANconnect.

Tools

Clear Messages - Clear the messages in the Messages box.

Export Messages… - Export the messages in the Messages box to a text file.

Read Serial Number - Read the connected module's serial number. This will display in the information box at the bottom.

Write Serial Number… - Assign a new serial number to the connected module. This will display in the information box at the bottom.

Open Boot Loader… - Open the Boot Loader to update the module's firmware.

Open PKP Boot Loader… - Open the PKP Boot Loader to update the module's firmware.

Open **module Interface… -** Open a specific module editing interface window.

Open CANopen Interface… - Open the switch panel CANopen interface.

Open PKP Interface… - Open the PKP module editing interface window.

Open PKUXX00 Interface… - Open the PKUXX00 module editing interface window.

Advanced

View Module Details… - List the address, buffer size, and messages of the module. This may be used for debugging.

Device Listing… - Scan for the number of USB devices connected.

Interrogate USB to CAN - Interrogate the USB to CAN connection. This will display in the information box at the bottom.

Change Address… - Change the address of the selected module. This refers to the HMI address stored internally. These are used to differentiate between multiple modules connected simultaneously with different designs.

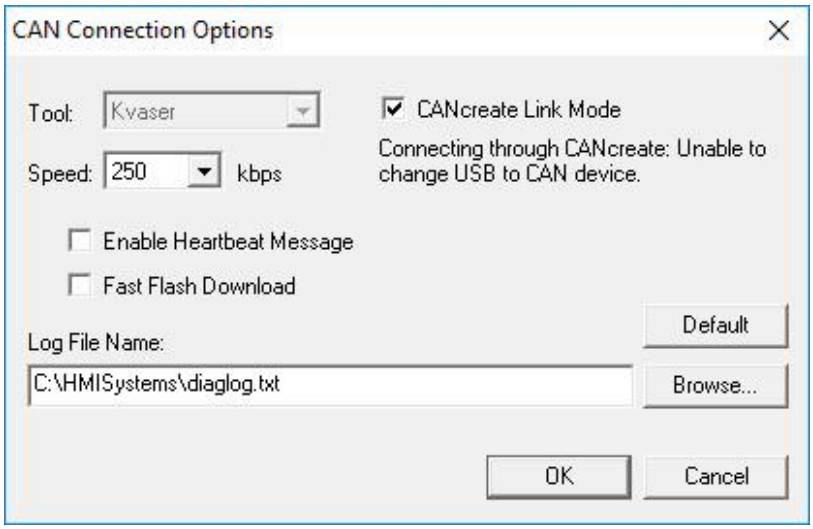
Note: This is not the physical source or destination address in the CAN network. The address must be unique for each module.

Export Module Details - Export the module details to a text file.

Copy Message Window To clipboard - Copy the Message window to the clipboard.

Options

CAN Connection Options… - Select the CAN connection specifications.



Tool: - Select the CAN adapter being used.

Speed: - Select the connection speed.

Enable Heartbeat Message - Provide an idle message that is transmitted periodically to aid in auto baud detection.

Fast Flash Download - Enable faster boot load times.

Note: This may cause issues on slower systems.

CANcreate Link Mode - Force CANconnect to connect to CANcreate in order for both applications to share a USB to CAN adapter. While in this mode you may only change the CAN bus speed from CANconnect.

Log File Name: - Select the log file name and location.

Read Only Mode - Turn on or off read only mode.

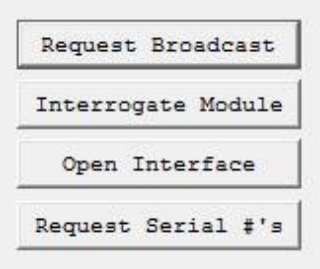
Receive Filter… - Filter the Messages box to view only messages with a certain Message ID and Message Mask.

Help

Title... - Display the CANconnect version number and HMI copyright information.

About... - Currently unavailable.

2.3 Main Window Interface



Request Broadcast - Locate any attached modules. The modules will show up in the Modules box and corresponding messages in the Message box.

Interrogate Module - Read and list the module address and version information of the selected module in the information box at the bottom.

Open Interface - Open the editing interface for the selected module.

Request Serial #'s - Read and list the module's serial number in the information box at the bottom.

New Module... - Create a new module with a specific address and module type.

Change Address... - Change the address of the selected module.

Delete Module - Delete the selected module.

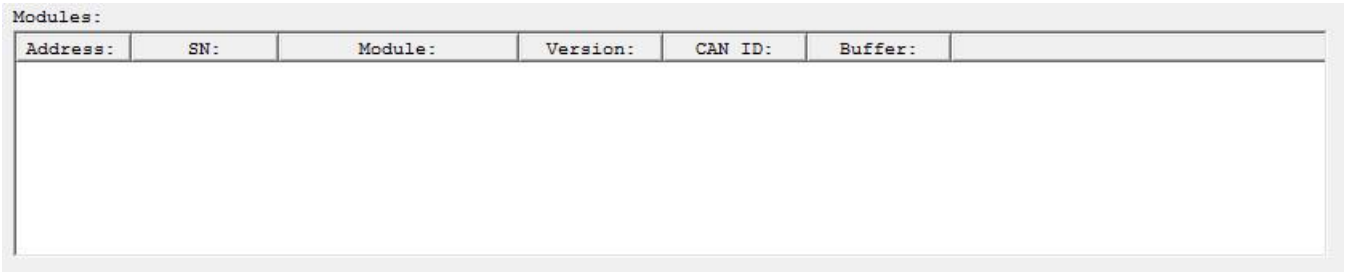
Select - Select a module.

Master - Use Master to communicate with any module regardless of address.

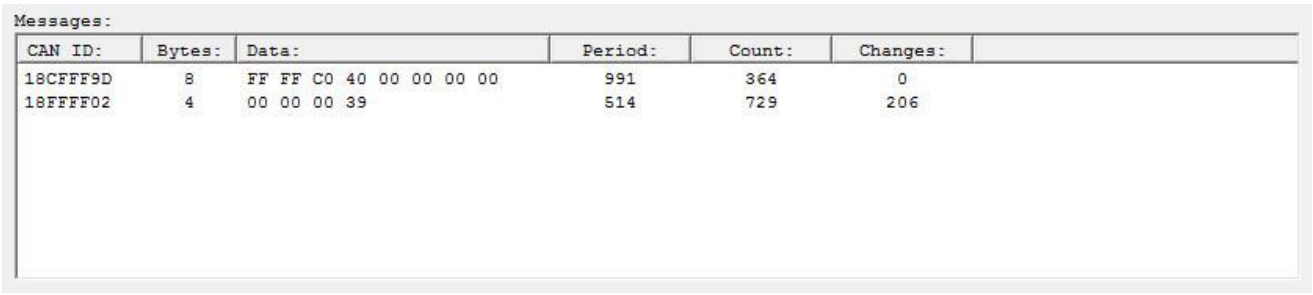
> **Note:** Master should only be used when one module of an unknown address is attached to the CAN network. Once Master has been selected, enter an address and click Write to force assign it to the module.

Read - Read the address of the selected module.

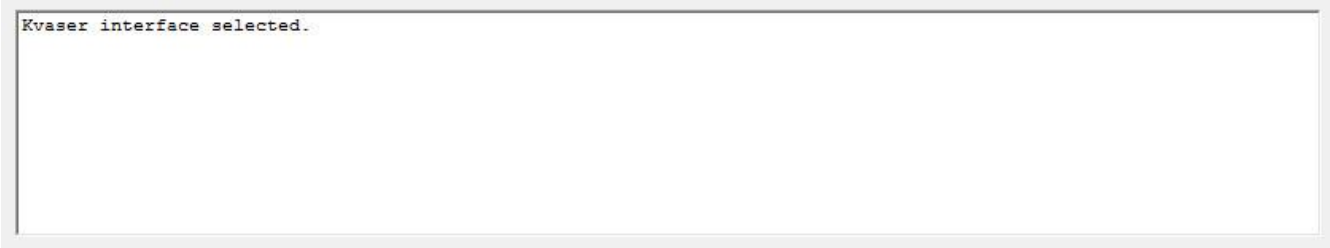
Write - Enter a new address in the box and click Write to assign it to the selected module.



Modules: - List the following information for any connected modules: module Address, module Serial Number, Module type, firmware Version number, CAN ID value, and Buffer value.



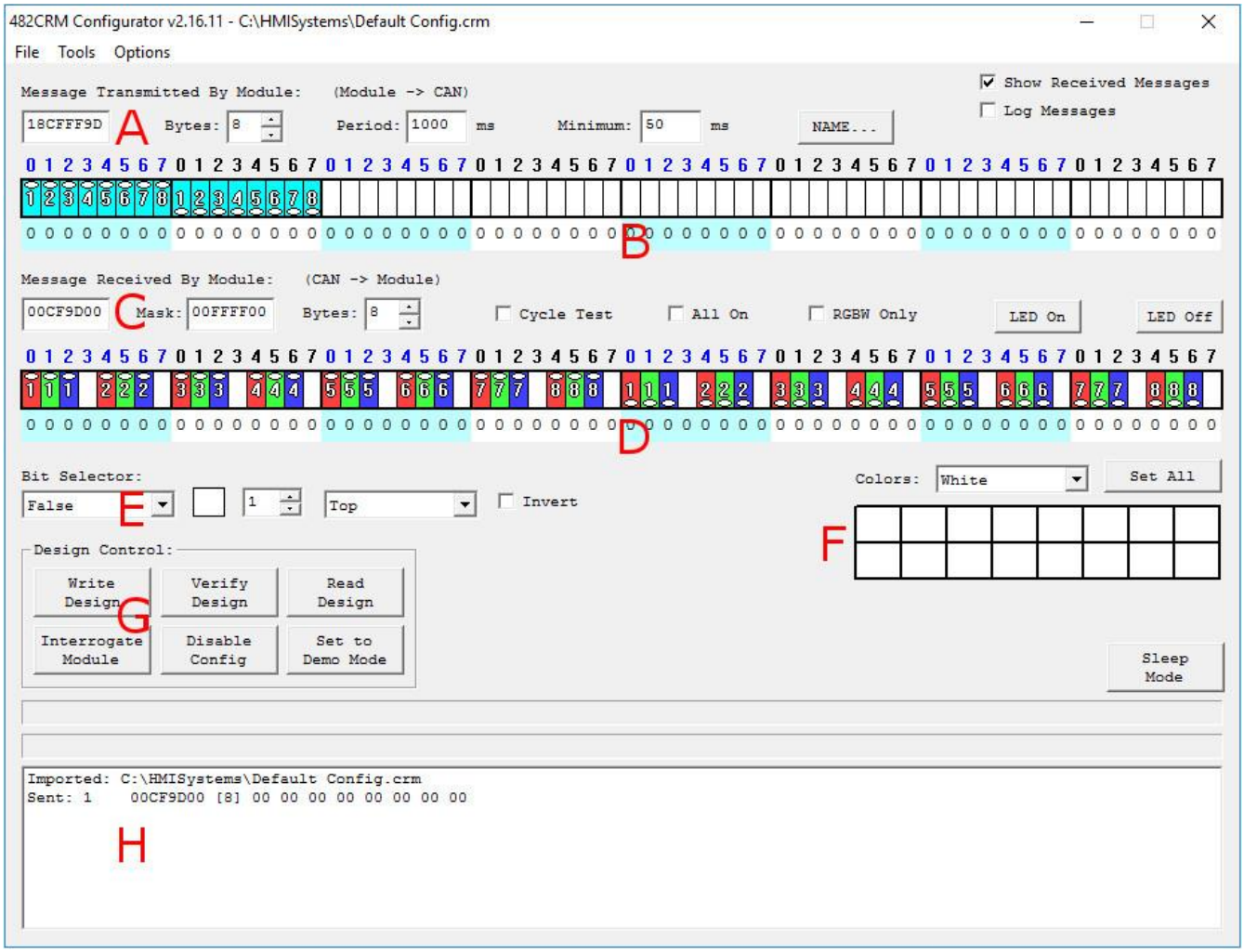
Messages: - List the following incoming value messages from any connected modules: CAN ID, Bytes, Data, Period, Count, and Changes.



Action Message Box - The bottom information box displays action messages currently executing or those which have already been executed. Any errors or successful module command messages will be shown in this box.

Chapter 3 - Modules

3.1 482CRM Interface



Interface Toolbar:

File

New - Open a new .crm file.

Import... - Import a previously created .crm file.

Export... - Export the current 482CRM configuration as a .crm file.

Close - Close the interface window.

Tools

Open Diagnostics Window… - Test and verify that components are working correctly.

Open Burn In Window… - For factory use only.

Read Diagnostics - For factory use only.

Rotate Switch 180 - Change switch assignments from low to high byte and from high to low.

Invert Received - Swap each switch's top and bottom setting.

Options

Read Only Mode - Prevent editing.

Reverse Displayed Bit Order - Change the bit order from 0->7 to 7->0.

Interface Workspace:

A. The Message Transmitted By Module section is where the information to be transmitted is specified. The first text field includes the destination address in the CAN system. The Bytes field specifies how many bytes. The Period field specifies how often the information is being sent in milliseconds. The Minimum field is the fastest the data can be sent when transmitting on change. The NAME button opens a new window that edits the message that will be transmitted when the module powers up.

B. This bar is the visual representation of the bytes being transmitted. Each byte is broken down into each of its eight bits. The individual bits within each byte can be changed to be associated with a certain switch, and/or switch position, that the receiving CAN module can decode.

C. The Message Received By Module section is where the address and mask can be set in order to listen to the correct module. The number of bytes to use may also be specified as well as how the LEDs are to be configured in order to test functionality.

D. This bar is a visual representation of the bytes received and what the significance of each bit has for the LEDs on the module. Using the tools below, LEDs can be set to a variety of colors and locations (top or bottom LED on a switch).

E. The Bit Selector includes False, True, Switch, LED, Enable, Power, Enable All, Power All, Red LED, Green LED, and Blue LED. Each selector affects the switches in a different way, with some being associated with a specific color (seen in the square next to the drop down menu). The number field is the Switch Selector and can be set between 1 and 8 with each representing a

switch on the module, from left to right, starting with 1. For example, set the value as 2, select the Red LED drop-down option, and select a byte. The byte value will show as 2, meaning switch 2. The drop-down menu with the options Top and Bottom is the Row Selector and can be used to select the top or bottom LED on the switch. Checking the Invert box will set the LED to be true on 0 instead of 1.

False - This bit will always transmit as a 0. It has no effect on received messages.

True - This bit will always transmit as a 1. It has no effect on received messages.

Switch - This represents the status of a switch. Use the Switch Selector to select one of the eight switches, and the Row Selector to select whether it's the top or bottom switch. It has no effect on received messages.

LED - This is used to control the LED. Use the Switch Selector to select one of the eight switches, and the Row Selector to select whether it's the top or bottom LED. Transmitted messages with LED bits will reflect the status of the last received message.

Enable - A single bit that enables the top or bottom row of LEDs. This control is optional. If no enable bit is specified, the LEDs will default to on. Use Enable All to enable both the top and bottom rows of LEDs with a single bit.

Power - Eight bits for each row represent the power (intensity) of the LEDs. A value of 0 is 0% and a value of 255 is 100%. Any power bits after the first eight will be ignored. If less than eight bits are specified, the least significant bits are filled with the value of the most significant bit (the bits specified are assumed to be the most significant). This control is optional. If no power bits are specified, the LEDs will default to 100% on.

Enable ALL - This enables all switch LEDs.

Power ALL - This sets all switch LED powers to 100%.

Red LED - This sets all switch LEDs to red.

Green LED - This sets all switch LEDs to green.

Blue LED - This sets all switch LEDs to blue.

Output – Controls any auxiliary outputs on the received message and reports their status in the transmit message. Currently only supported by the PKUXX00 series of switch panels.

Feedback – Reports the status of the auxiliary outputs with the value of 1 indicating a fault. This has no effect on the received message. Currently only supported by the PKUXX00 series of switch panels.

F. The Colors drop-down menu has a selection of colors from black to white. The top eight boxes represent the top LEDs on eight switches with the bottom eight boxes representing the bottom LEDs. Using the drop-down menu, colors can be placed into the boxes. Use the Bit Selector LED option to enable that color in the corresponding bit. This method allows for LED control with two bytes, but limits the LED customization.

G. In the Design Controls box, the design can be programmed onto the module with Write Design. Verify Design allows you to verify the design on the current module. To import the current design from the module, use Read Design. To get the module's address and version information, use Interrogate Module. Disable Config will disable configuration on the module. Set to Demo Mode will put the module into demo mode.

> **Note:** When reading a design, bad response messages may occur. Ensure connections are correct and retry.

H. The Information Message section indicates what actions have occurred and may be currently executing. Any errors or successful read, write, and verify messages will be shown in this message section.

482CRM Physical Device

The switches can be set up for many different uses. The switch can rock up and down, to be used for an increasing/decreasing function. Single directional rocker switches may also be used. If all switches are not used, a blank dummy switch may be inserted.

3.2 482CRM Tutorial

> **Note:** This requires a CAN-USB adapter and 482CRM module.

1. Connect the 482CRM module to the PC via a CAN to USB adapter.

2. Open CANconnect and click Request Broadcast. The attached module should show up in the Modules section. Double-click the module to open the editing interface.

3. Click the Interrogate Module button. In the information message field, the address of the module, the model, and firmware version are listed.

4. Under Message Transmitted By Module, set the ID field as "18EFFF94". Set Bytes at 8, Period to 1000ms, and Minimum to 100ms.

> **Note:** This Message ID is for illustrative purposes only and can be set to whatever works with your system.

5. For the Byte/Bit representation field, use the Bit Selector drop down menu to select Switch with the value 1 and Top in the corresponding fields. Click in bit 0 of Byte 1. A light blue box should show up with "1" inside and a white oval at the top. Change the value under Bit Selector to 2. Click bit 1 of Byte 1. Repeat until all 8 bits are filled in Byte 1. The last should be switch 8 in bit 7.

6. For Byte 2, repeat step 5 except change the Top property to Bottom. Leave Bytes 3 to 8 blank.

7. Under Message Received By Module, set the ID field as "18EFFF93" and Mask as "1FFFFFFF". Leave Bytes as 8 and Cycle Test unchecked.

> **Note:** This Message ID is for illustrative purposes only and can be set to whatever works with your system.

8. Use the Bit Selector to pick Red LED, set the value as 1 and drop-down menu to Top. Click the bit 0 in Byte 1 of the receiving message. Increment the value to 2 and click bit 1 in Byte 1. Repeat up to value 8 for bit 7.

9. Change the property to Bottom and repeat step 8 for Byte 2.

10. Change the Bit Selector to Green LED and repeat step 8 for Byte 3. Then change the property to Bottom and fill in Byte 4.

11. Change the Bit Select to Blue LED and repeat step 8 for Byte 5. Then change property to Bottom and fill in Byte 6.

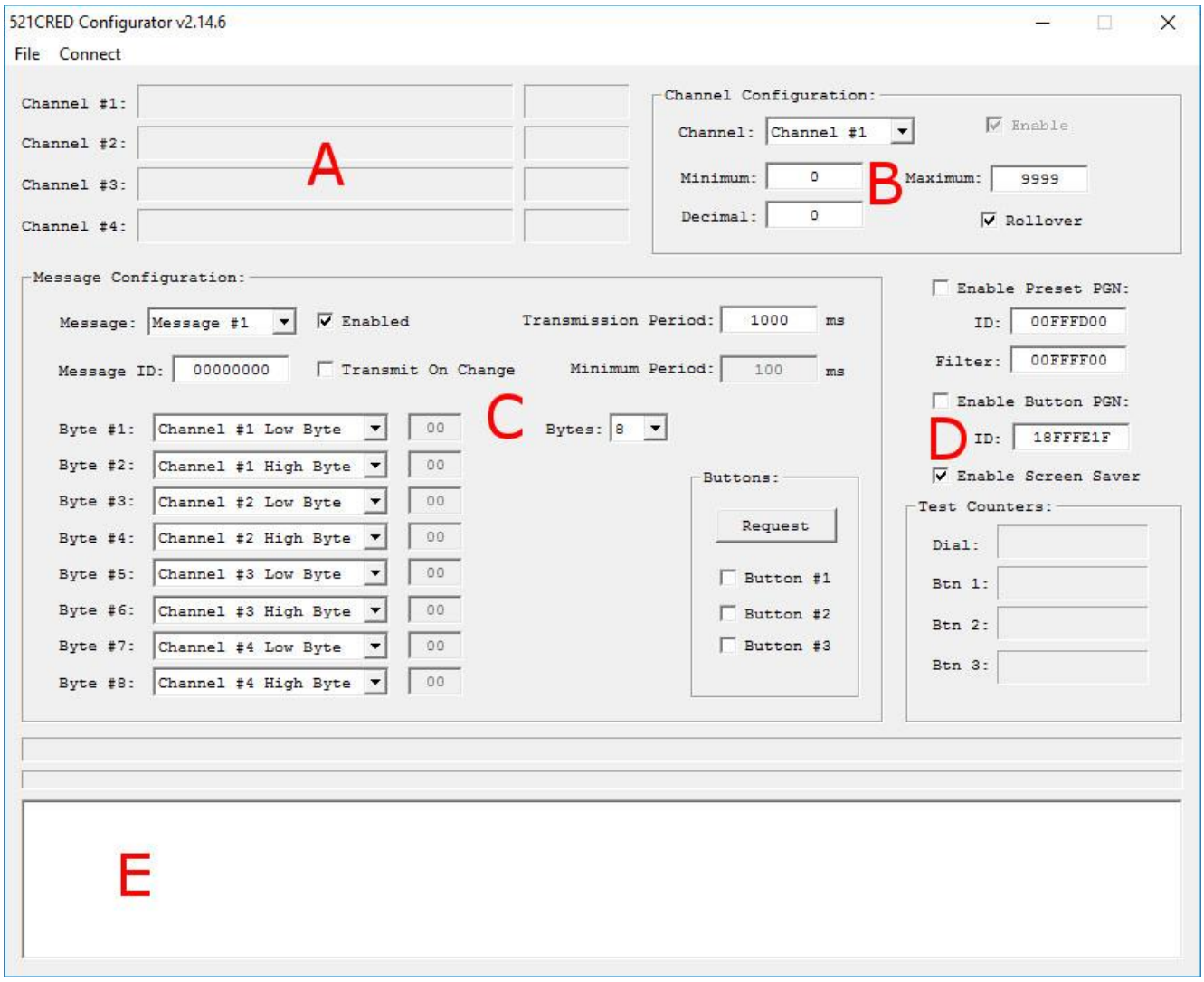
12. Next, use the Bit Selector to pick Enable All. Click bit 0 in Byte 7. A yellow box with two white ovals should be placed.

13. Return to the Bit Selector and change to Power. Make sure the top property is active. Click on bits 0 to 3 in Byte 8. Purple boxes should be placed with top ovals. For bits 4 to 7, use Power with Bottom property active.

14. Click the Write Design button. The module is now programmed.

15. OPTIONAL: Follow the Post-Test Setup instructions to test the newly edited 482CRM.

3.3 521CRED Interface



Interface Toolbar:

File

New - Reset all interface values to their defaults.

Close - Close the interface window.

Connect

Interrogate Module - Return the device address and version information.

Write Design - Export the newly created design to the device.

Verify Design - Ensure that the correct design is loaded on the device.

Read Design - Import the design currently stored on the device.

Note: If bad response messages occur, check connections and retry.

Read Diagnostics - For factory use only.

Interface Workspace:

A. When connected to the module, each Channel will display the corresponding number on the module. The empty bar next to each channel will visually fill up when reaching its programmed maximum. The actual number will be displayed next to it.

B. The Channel Configuration section has Channel 1 displayed first by default. This section allows the setting of the minimum, maximum, and decimal location for each channel. Use the drop down menu next to "Channel:" to select channels 1 to 4. The minimum allowed is 0 and the maximum allowed is 9999. Checking the enable box, turns on and off a channel. Checking the Rollover box will allow the user to return to the minimum when the maximum is reached without turning the dial back the same direction.

C. Within the Message Configuration section, the Message drop down menu can select between 4 different messages. Each message will have its own Message ID and specify its own selection of bytes to receive/read. Use the Enabled check box to turn on and off individual messages. Check the Transmit on Change box to transmit a message every time the value changes, unless it will only transmit at the set transmission period. Set the transmission period in milliseconds in the Transmission Period field and set the minimum period in the Minimum Period field. Use Bytes 1 to 8 and the drop down menu adjacent to specify the channel it associates with and whether it uses the high or low byte.

D. The Buttons make sure the buttons are working correctly. The Test Counters are for factory use only.

E. The information message section indicates what actions have occurred and may be currently executing. Any errors or successful read/write/verify messages will be shown in this message section.

521CRED Physical Device

The module has a digital display, 3 buttons, and the adjustment dial. The 2 buttons with the up and down arrows increase/decrease the channel being accessed. The lock button can be set to lock the channel and dial (defaults as free input). Turn the dial clockwise to increase the numbers and counter-clockwise to

decrease them. Tuning the dial faster will change the numbers at a quicker rate, while turning it slower will provide a more accurate, fine tuning adjustment.

Note: Turning the dial too quickly may cause it to skip increments.

3.4 521CRED Tutorial

Note: This requires a CAN-USB adapter and 521CRED module.

1. Connect the 521CRED module to the PC via a CAN to USB adapter.

2. Open CANconnect and click Request Broadcast. The attached module should show up in the Modules section. Double-click the module to open the editing interface.

3. Go to the Connect tab and select Interrogate Module. In the information message field, the address of the module, the model, and firmware version are listed.

4. Under the Channel Configuration section, use the drop-down menu to select between each channel. Use the check box to enable each channel and set each with a minimum to 0 and maximum to 9999. Rollover should also be active.

5. Under the Message Configuration, let only Message 1 be enabled. Set the Transmission Period to 1000ms and Minimum Period to 100ms.

6. Write the Message ID to "18FEF44A" with Transmit on Change checked.

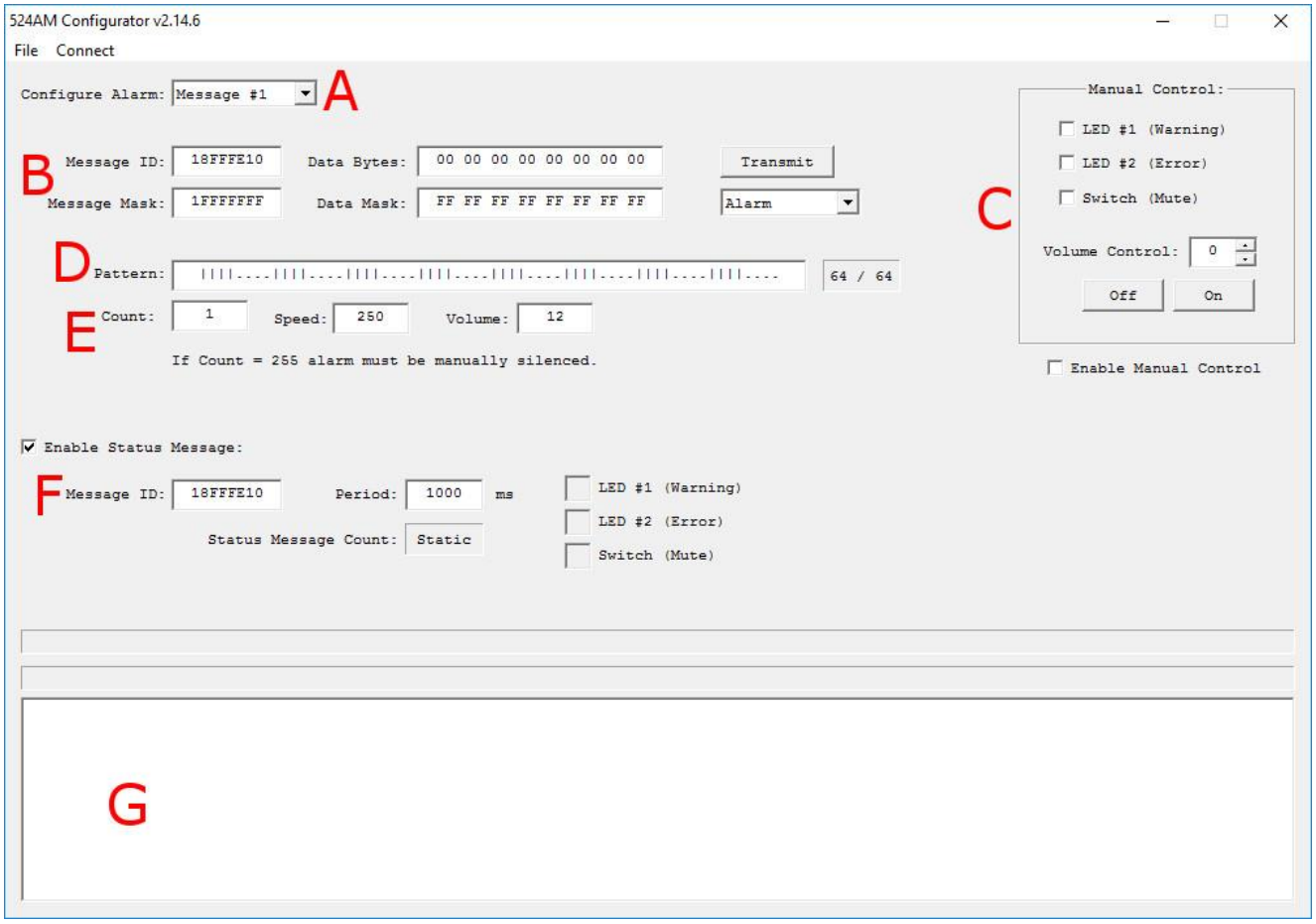
Note: This Message ID is for illustrative purposes only and can be set to whatever works with your system.

7. Using the drop-down menus set Byte 1 to "Channel #1 Low Byte" and Byte 2 to "Channel #2 High Byte." For bytes 3 to 8, set to Constant.

8. Go to Connect and Write Design. The module is now programmed.

9. OPTIONAL: Follow the Post-Test Setup instructions to test the newly edited 521CRED.

3.5 524AM Interface



Interface Toolbar:

File

Close - Close the interface window.

Connect

Interrogate Module - Return the device address and version information.

Write Design - Export the newly created design to the device.

Verify Design - Ensure that the correct design is loaded on the device.

Read Design - Import the design currently stored on the device.

Note: If bad response messages occur, check connections and retry.

Read Diagnostics - For factory use only.

Interface Workspace:

A. The Configure Alarm box allows for the implementation of four individual alarms or actions on the same device that correspond to different messages on the CAN bus. Use the drop-down box to select between them.

> **Note:** The same message mask will be shared across all four alarms.

B. The Message ID is a 29 bit CAN ID that is associated with each alarm. Use the Message Mask to mask out what bytes are needed and not needed for the alarm to sound. If the Data Bytes match the Data Mask, the alarm will be triggered. The Data Bytes and Data Mask are bitwise ANDed together so a single bit in the message can be isolated to trigger the alarm. Use the transmit button to send the current Message ID and Data Bytes over the CAN interface to test the alarm. The drop-down menu (default set to Alarm) can change what action the message triggers. Actions include Disabled, Alarm, Clear, and Silence.

> **Disabled** - The message isn't used.
>
> **Alarm** - The alarm pattern is played if criteria are matched.
>
> **Clear** - The message clears all active alarms, silences them, and clears all LED if criteria are matched.
>
> **Silence** - The message silences all active alarms if criteria are matched and clears warning LED. Error LED, however, will remain active.

C. Checking the Enable Manual Controls box enables these testing options. With a device connected, the volume level can be increased and decreased in the box next to Volume Control to test out what the appropriate volume level is for the current implementation. The two LED check boxes and Switch box allow for testing of those functions as well.

> **Note:** Enable Manual Controls are software features only and don't affect the actual testing of the module.

D. The Pattern section specifies the 64 bit configurable tone pattern to be played when the correct message is received by the module. The periods "." in the pattern turn the buzzer off and the lines "|" in the pattern turn the buzzer on. Continuous tones can be produced by multiple adjacent periods or lines. To create your own pattern, input zeros into the Pattern section to specify periods and ones to specify lines. Once 64 characters are typed in, the program will switch them to periods and lines for better readability.

E. Below the Pattern section is the Count, Speed, and Volume fields. The Count field defines how many times the pattern will be played upon receiving the correct message and data combination. Setting the count to

255 will repeat the alarm indefinitely and require either a message to clear or direct input from the operator through the mute button on the unit. The Speed field will determine how fast the pattern is played upon receiving the correct message and data combination. The lower the number, the faster the message will be played; higher numbers (up to 255) add delay in between each of the pattern's bits. The Volume field will determine how loud each pattern will be played. The volume goes from 1 to 255 (max). Full volume is approximately 105dB.

F. Checking the Enable Status Message box will allow the ability to echo back a status message. The status message will indicate the current state of the LED and switch. Set the Message ID and the period, and then it will start broadcasting the information.

Status message defined:

Byte 1

Bit 0 - Warning LED
Bit 1 - Error LED
Bit 2 - Switch status (1 = pressed, 0 = not pressed)

Byte 2

Current active alarm (value from 1 to 4)

G. The information message section indicates what actions have occurred and may be currently executing. Any errors or successful read/write/verify messages will be shown in this message section.

524AM Physical Device

Two indicators are provided for warnings and errors. The default mode will illuminate the red error LED and green warning LED during an alarm annunciation. Hitting the mute button will turn off the alarm annunciation tone. The green warning LED will remain lit until after the alarm annunciation is finished, even if the mute button is pressed. The red error LED will remain lit until the mute button is pressed.

3.6 524AM Tutorial

> **Note:** This requires a CAN-USB adapter and an eight switch 524AM module.

1. Connect the 524AM module to the PC via a CAN to USB adapter.

2. Open CANconnect and click Request Broadcast. The attached module should show up in the Modules section. Double-click the module to open the editing interface.

3. Go to the Connect tab and select Interrogate Module. In the information message field, the address of the module, the model, and firmware version are listed.

4. The Volume Control field is used to test the correct volume for the module. Setting a number in the field and clicking the "On" button will play that sound from the module. Leave Disable Manual Controls checked.

5. Under Configure Alarm, select Alarm #1. For Message ID, enter "18FEF44B". Next, in the Data Bytes field enter "01 00 00 00 00 00 00 00". In the Message Mask field enter "1FFFFFFF".

> **Note:** This Message ID is for illustrative purposes only and can be set to whatever works with your system.

6. To specify the pattern, use 1's and 0's. Type in "11110000111100001111000011110000111100001111000011110000111100 00". This will then change to "||||....||||....||||....||||....||||....||||....||||....||||...." for a better visualization of the pattern.

7. Finally, set Count to 3 (to repeat the pattern three times), set Speed to 1, and Volume to 50.

8. Go to the Connect tab and select Write Design. The module is now programmed.

9. OPTIONAL: Follow the Post-Test Setup instructions to test the newly edited 524AM.

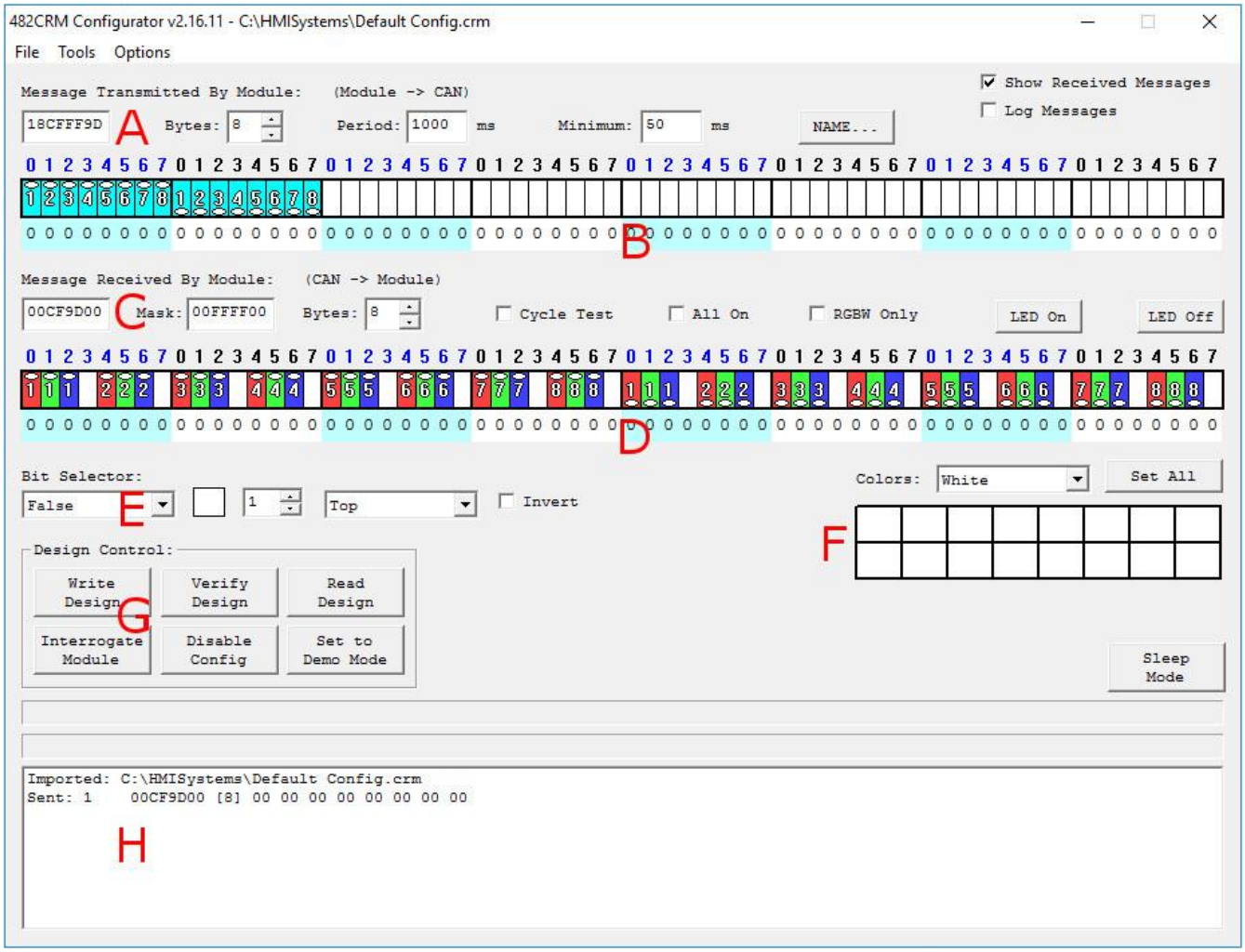
3.7 529BIB Interface

For factory use only.

3.8 529BIB Tutorial

For factory use only.

3.9 531CRM Interface



(The 531CRM Configurator window is similar to the 482CRM's.)

Interface Toolbar:

File

New - Open a new .crm file.

Import... - Import a previously created .crm file.

Export... - Export the current 531CRM configuration as a .crm file.

Close - Close the interface window.

Tools

Open Diagnostics Window... - Test and verify that components are working correctly.

Open Burn In Window... - For factory use only.

Read Diagnostics - For factory use only.

Rotate Switch 180 - Change switch assignments from low to high byte and from high to low.

Invert Received - Swap each switch's top and bottom setting.

Options

Read Only Mode - Prevent editing.

Reverse Displayed Bit Order - Change the bit order from 0->7 to 7->0.

Interface Workspace:

A. The Message Transmitted By Module section is where the information to be transmitted is specified. The first text field includes the destination address in the CAN system. The Bytes field specifies how many bytes. The Period field specifies how often the information is being sent in milliseconds. The Minimum field is the fastest the data can be sent when transmitting on change. The NAME button opens a new window that edits the message that will be transmitted when the module powers up.

B. This bar is the visual representation of the bytes being transmitted. Each byte is broken down into each of its eight bits. The individual bits within each byte can be changed to be associated with a certain switch, and/or switch position, that the receiving CAN module can decode.

C. The Message Received By Module section is where the address and mask can be set in order to listen to the correct module. The number of bytes to use may also be specified as well as how the LEDs are to be configured in order to test functionality.

D. This bar is a visual representation of the bytes received and what the significance of each bit has for the LEDs on the module. Using the tools below, LEDs can be set to a variety of colors and locations (top or bottom LED on a switch).

E. The Bit Selector includes False, True, Switch, LED, Enable, Power, Enable All, Power All, Red LED, Green LED, and Blue LED. Each selector affects the switches in a different way, with some being associated with a specific color (seen in the square next to the drop down menu). The number field is the Switch Selector and can be set between 1 and 8 with each representing a switch on the module, from left to right, starting with 1. For example, set the value as 2, select the Red LED drop-down option, and select a byte. The byte value will show as 2, meaning switch 2. The drop-down menu with the options Top and Bottom is the Row Selector and can be used to select the

top or bottom LED on the switch. Checking the Invert box will set the LED to be true on 0 instead of 1.

False - This bit will always transmit as a 0. It has no effect on received messages.

True - This bit will always transmit as a 1. It has no effect on received messages.

Switch - This represents the status of a switch. Use the Switch Selector to select one of the eight switches, and the Row Selector to select whether it's the top or bottom switch. It has no effect on received messages.

LED - This is used to control the LED. Use the Switch Selector to select one of the eight switches, and the Row Selector to select whether it's the top or bottom LED. Transmitted messages with LED bits will reflect the status of the last received message.

Enable - A single bit that enables the top or bottom row of LEDs. This control is optional. If no enable bit is specified, the LEDs will default to on. Use Enable All to enable both the top and bottom rows of LEDs with a single bit.

Power - Eight bits for each row represent the power (intensity) of the LEDs. A value of 0 is 0% and a value of 255 is 100%. Any power bits after the first eight will be ignored. If less than eight bits are specified, the least significant bits are filled with the value of the most significant bit (the bits specified are assumed to be the most significant). This control is optional. If no power bits are specified, the LEDs will default to 100% on.

Enable ALL - This enables all switch LEDs.

Power ALL - This sets all switch LED powers to 100%.

Red LED - This sets all switch LEDs to red.

Green LED - This sets all switch LEDs to green.

Blue LED - This sets all switch LEDs to blue.

Output – Controls any auxiliary outputs on the received message and reports their status in the transmit message. Currently only supported by the PKUXX00 series of switch panels.

Feedback – Reports the status of the auxiliary outputs with the value of 1 indicating a fault. This has no effect on the received message. Currently only supported by the PKUXX00 series of switch panels.

F. The Colors drop-down menu has a selection of colors from black to white. The top eight boxes represent the top LEDs on eight switches with the bottom eight boxes representing the bottom LEDs. Using the drop-down

menu, colors can be placed into the boxes. Use the Bit Selector LED option to enable that color in the corresponding bit. This method allows for LED control with two bytes, but limits the LED customization.

G. In the Design Controls box, the design can be programmed onto the module with Write Design. Verify Design allows you to verify the design on the current module. To import the current design from the module, use Read Design. To get the module's address and version information, use Interrogate Module. Disable Config will disable configuration on the module. Set to Demo Mode will put the module into demo mode.

> **Note:** When reading a design, bad response messages may occur. Ensure connections are correct and retry.

H. The Information Message section indicates what actions have occurred and may be currently executing. Any errors or successful read, write, and verify messages will be shown in this message section.

531CRM Physical Device

The switches can be set up for many different uses, including rocking up or down for an increasing or decreasing function. Single directional rocker switches can also be used. A blank dummy switch can be inserted into any unused slots.

3.10 531CRM Tutorial

> **Note:** This requires a CAN-USB adapter and 531CRM module.

1. Connect the 531CRM module to the PC via a CAN to USB adapter.

2. Open CANconnect and click Request Broadcast. The attached module should show up in the Modules section. Double-click the module to open the editing interface.

3. Click the Interrogate Module button. In the information message field, the address of the module, the model, and firmware version are listed.

4. Under Message Transmitted By Module, set the ID field as “18EFFF94”. Set Bytes at 8, Period to 1000ms, and Minimum to 100ms.

> **Note:** This Message ID is for illustrative purposes only and can be set to whatever works with your system.

5. For the Byte/Bit representation field, use the Bit Selector drop down menu to select Switch with the value 1 and Top in the corresponding fields. Click in bit 0 of Byte 1. A light blue box should show up with "1" inside and a white oval at the top. Change the value under Bit Selector to 2. Click bit 1 of Byte 1. Repeat until all 8 bits are filled in Byte 1. The last should be switch 8 in bit 7.

6. For Byte 2, repeat step 5 except change the Top property to Bottom. Leave Bytes 3 to 8 blank.

7. Under Message Received By Module, set the ID field as "18EFFF93" and Mask as "1FFFFFFF". Leave Bytes as 8 and Cycle Test unchecked.

> **Note:** This Message ID is for illustrative purposes only and can be set to whatever works with your system.

8. Use the Bit Selector to pick Red LED, set the value as 1 and drop-down menu to Top. Click the bit 0 in Byte 1 of the receiving message. Increment the value to 2 and click bit 1 in Byte 1. Repeat up to value 8 for bit 7.

9. Change the property to Bottom and repeat step 8 for Byte 2.

10. Change the Bit Selector to Green LED and repeat step 8 for Byte 3. Then change the property to Bottom and fill in Byte 4.

11. Change the Bit Select to Blue LED and repeat step 8 for Byte 5. Then change property to Bottom and fill in Byte 6.

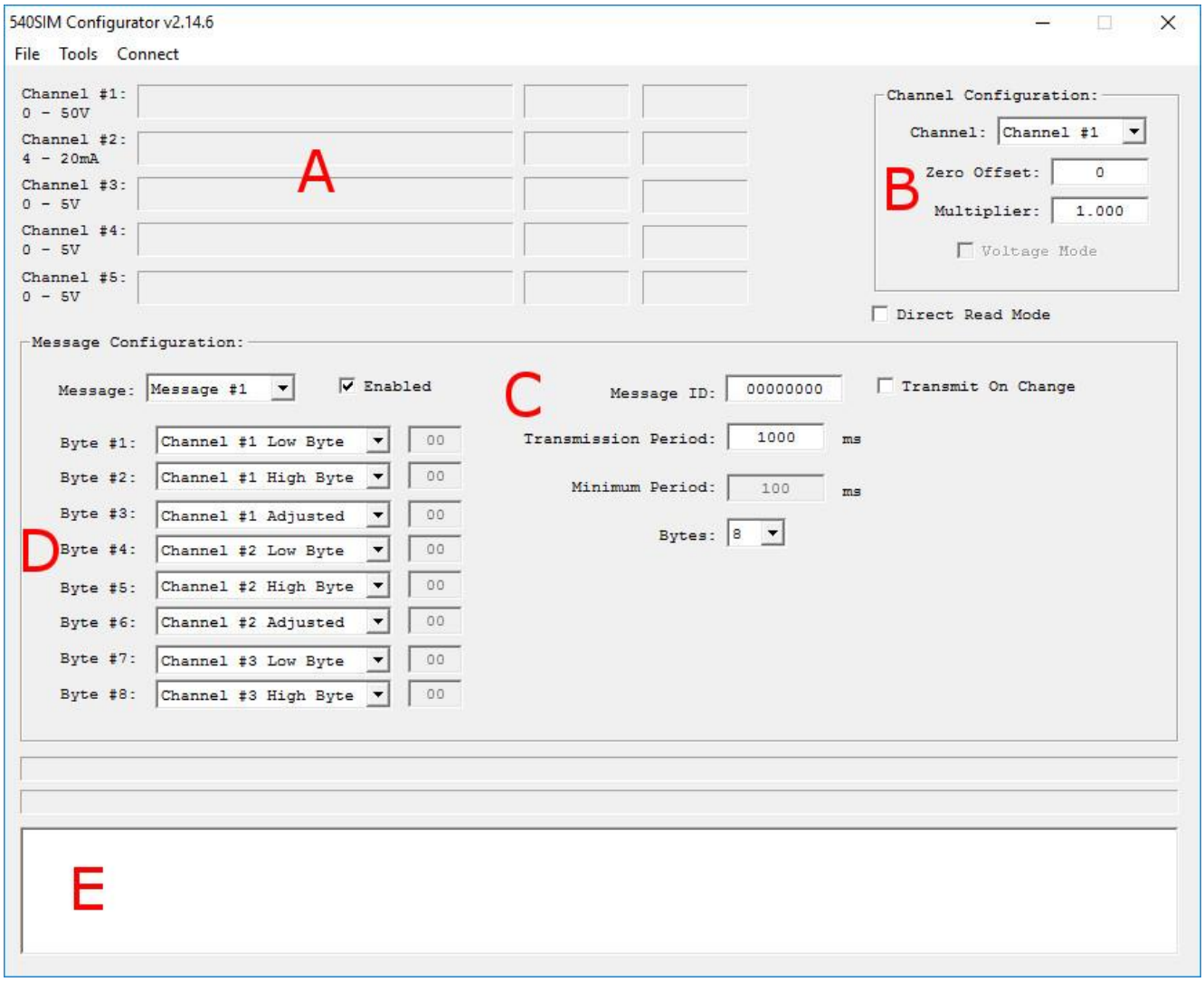
12. Next, use the Bit Selector to pick Enable All. Click bit 0 in Byte 7. A yellow box with two white ovals should be placed.

13. Return to the Bit Selector and change to Power. Make sure the top property is active. Click on bits 0 to 3 in Byte 8. Purple boxes should be placed with top ovals. For bits 4 to 7, use Power with Bottom property active.

14. Click the Write Design button. The module is now programmed.

15. OPTIONAL: Follow the Post-Test Setup instructions to test the newly edited 531CRM.

3.11 540SIM Interface



Interface Toolbar:

File

New - Reset all interface values to their defaults.

Close - Close the interface window.

Tools

Open Diagnostics Window... - For factory use only.

Open Factory Calibration... - For factory use only.

Connect

Interrogate Module - Return the device address and version information.

Write Design - Export the newly created design to the device.

Verify Design - Ensure that the correct design is loaded on the device.

Read Design - Import the design currently stored on the device.

Note: If bad response messages occur, check connections and retry.

Read Diagnostics - For factory use only.

Interface Workspace:

A. When connected to the module, each Channel will display the corresponding voltage value on the module. The empty bar next to each Channel will visually fill up in accordance to the value being read. The actual number will be displayed next to it.

B. Under the Channel Configuration, there are three fields. The Channel field contains a drop-down menu to select what Channel that you want to edit (Channels 1 to 5). The Zero Offset and Multiplier fields are used to calibrate the module for the system. For Channels 3 through 5, the Voltage Mode box can be checked and activated.

Note: When Voltage Mode is unchecked, these Channels will measure a resistive input.

C. Under Message Configuration, the Message field drop-down menu can be used to add or edit up to five different messages. Checking the Enabled box will activate that message's number. They each have their own Message ID which can be changed in the Message ID field. Checking the Transmit On Change box will have the module send data every time it gets modified instead of waiting for the set transmission period. It will not transmit faster than the value set in the Minimum Period field.

D. Each of the eight Byte fields can be configured to return the data of any channel's analog value. To get the full 10 bit analog value you must use both the "Low Byte" and "High Byte" options, consuming two bytes of the eight byte message. Alternatively, you can use the "Adjusted" option to get the 10 bit value reduced to 8 bits (divided by four) so it will fit in a single byte. The "Status" option is used for error detection resulting from an external fault due to a fuse trip.

E. The information message section indicates what actions have occurred and may be currently executing. Any errors or successful read/write/verify messages will be shown in this message section.

540SIM Physical Device

This module supports one 0-50V channel, one 4-20mA channel, and three 0-5V channels.

3.12 540SIM Tutorial

Note: This requires a CAN-USB adapter and 540SIM module.

1. Connect the 540SIM module to the PC via CAN to USB adapter.

2. Open CANconnect and click Request Broadcast. The attached module should show up in the Modules section. Double-click the module to open the editing interface.

3. Go to Connect and interrogate Module. In the information message field, the address of the module, the model, and firmware version are listed.

4. Under Channel Configuration, verify that Channel #1 has a zero Offset of 0 and Multiplier of 1.

5. Next, under Message Configuration, check the box to enable message #1. Set the Transmission Period to 1000ms. For the Message ID, write in "18EFFF96". Leave Transmit On Change unchecked.

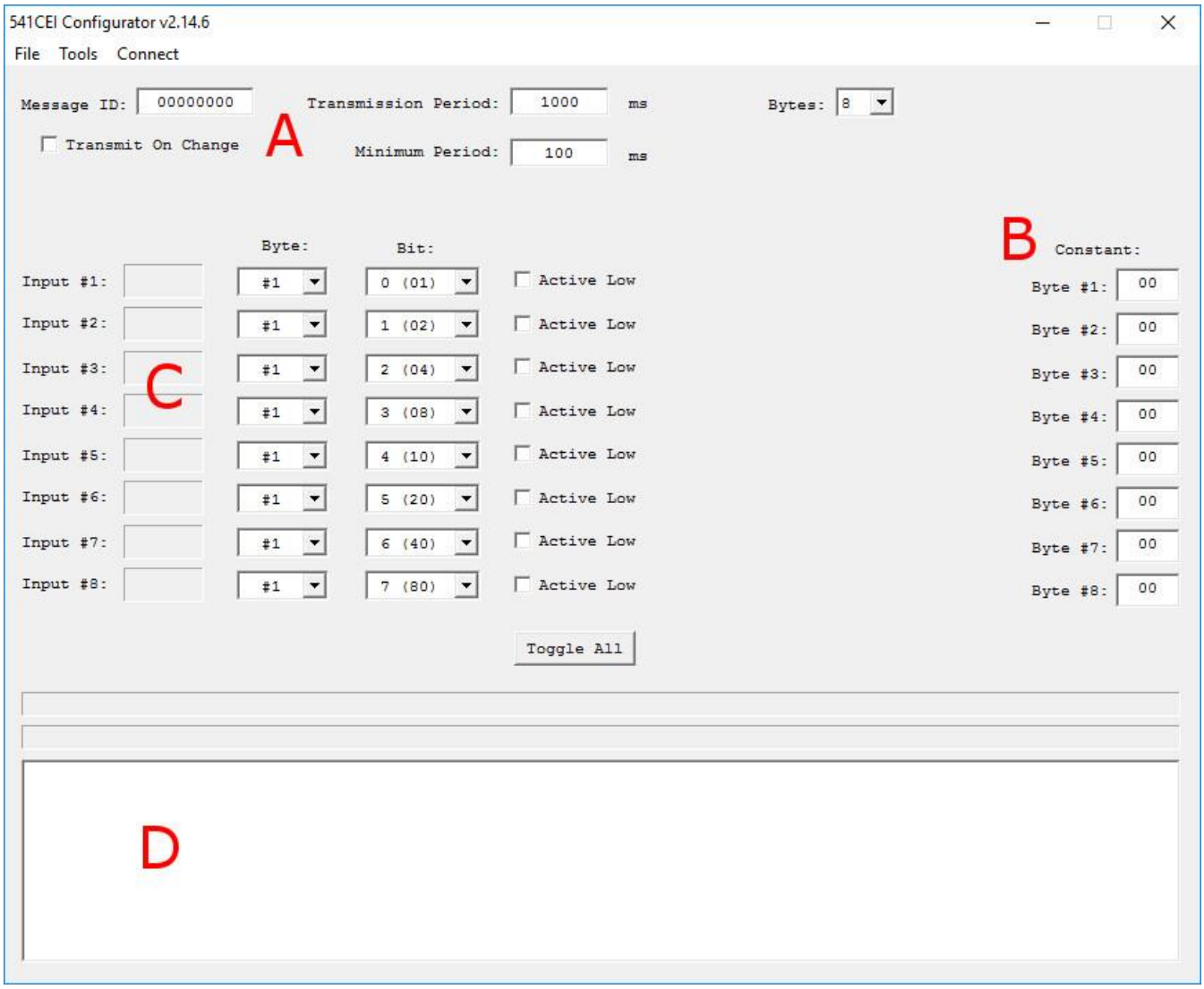
Note: This Message ID is for illustrative purposes only and can be set to whatever works with your system.

6. For Byte #1, use the drop-down menu to select "Channel #1 Low Byte". Next, set Byte #2 to "Channel #1 High Byte". In Byte #3, set it to "Channel #1 Adjusted". Finally, in Byte #4, select "Status Register". For the remaining bytes, set them all as "Constant" with "00" in each number field next to them.

7. Go to Connect and Write Design. The module is now programmed.

8. OPTIONAL: Follow the Post-Test Setup instructions to test the newly edited 540SIM.

3.13 541CEI Interface



Interface Toolbar:

File

New - Reset all interface values to their defaults.

Close - Close the interface window.

Tools

Open Diagnostics Window... - For factory use only.

Connect

Interrogate Module - Return the device address and version information.

Write Design - Export the newly created design to the device.

Verify Design - Ensure that the correct design is loaded on the device.

Read Design - Import the design currently stored on the device.

Note: If bad response messages occur, check connections and retry.

Read Diagnostics - For factory use only.

Interface Workspace:

A. The Message ID field edits the specific address for the module. When the Transmit on Change box is checked, the module will send the new data before the Transmission Period. It will not transmit any faster than the Minimum Period. The Bytes drop-down menu changes the number of bytes to be looked at.

B. This lists the inputs coming into the module. Next, in the Byte column, each input has a drop-down menu to select what byte it will be compared to (Bytes 1 to 8). In the Bit column, each input has a drop-down menu to select which bit from the previously selected byte to use. Finally, the Active Low check box can be used to change from active high to active low or active low to active high. The Toggle All button can be used to check or uncheck all the boxes at once.

C. Under the Constant section, each Byte being used can be set using a constant. By default, all are set to 00. The constant value is exclusive ORed with the value detected on the input. When an active high input is selected the non-active result is true. When the input is detected as being active high, the result will be false.

Example: Bit 0 of byte 1 is active high. When the external input is pulled low bit 0 is 1. When the external input is pulled high bit 0 is 0. Writing a value of 01 to the constant field will XOR the results so that the external input pulled low equates bit 0 to 0 and the external input pulled high equates bit 0 to 1.

D. The information message section indicates what actions have occurred and may be currently executing. Any errors or successful read/write/verify messages will be shown in this message section.

541CEI Physical Device

This module supports eight digital inputs that can be individually configured as active high or active low.

3.14 541CEI Tutorial

Note: This requires a CAN-USB adapter and 541CEI module.

1. Connect the 541CEI module to the PC via CAN to USB adapter.

2. Open CANconnect and click Request Broadcast. The attached module should show up in the Modules section. Double-click the module to open the editing interface.

3. Go to Connect and interrogate Module. In the information message field, the address of the module, the model, and firmware version are listed.

4. In the Message ID field, write "18EFFF97". Check the Transmit On Change box. Set the Transmission Period to 1000ms and Minimum Period to 100ms. Make sure Bytes is set to 8.

Note: This Message ID is for illustrative purposes only and can be set to whatever works with your system.

5. For every input (#1 to #8), under the Byte column, set each drop-down menu to #1.Under the Bit column, set Input #1 to 0. For Input #2, set bit to 1. Repeat for Inputs #3 to #8 with bits 2 to 7.

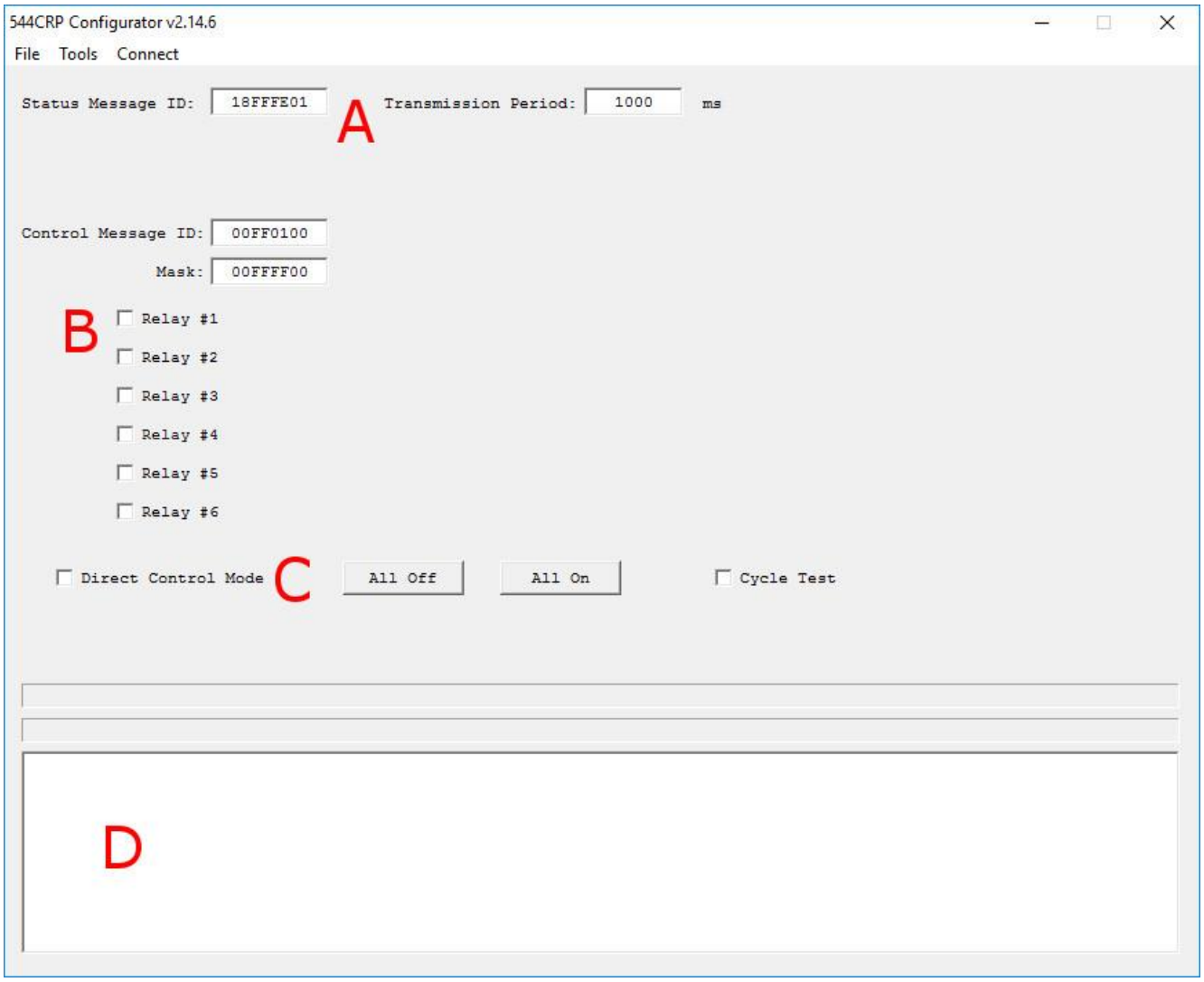
6. Click Toggle All to make all Active Low boxes checked.

7. Under the Constant list of Bytes on the right, set Byte #1 to 55. Leave Bytes #2 to #8 as 00.

8. Go to Connect and Write Design. The module is now programmed.

9. OPTIONAL: Follow the Post-Test Setup instructions to test the newly edited 541CEI.

3.15 544CRP Interface



Interface Toolbar:

File

New - Reset all interface values to their defaults.

Close - Close the interface window.

Tools

Open Diagnostics Window... - For factory use only.

Connect

Interrogate Module - Return the device address and version information.

Write Design - Export the newly created design to the device.

Verify Design - Ensure that the correct design is loaded on the device.

Read Design - Import the design currently stored on the device.

Note: If bad response messages occur, check connections and retry.

Read Diagnostics - For factory use only.

Interface Workspace:

A. Define the status message CAN ID. The status message is an eight byte message. Byte #1 is the module voltage (255=50V), Byte #2 is the current relay PWM level (255=100%), and Byte #3 is the current status of the relays.

B. Define the control message CAN ID and mask. The message should be eight bytes in length. The first byte controls the relays. The remaining bytes are reserved for future use. The check boxes can be used to manually control the relays.

C. Enable direct control model. Direct control mode does not require the module to be programmed with the design to control the LEDs. Only one module can be on the CAN bus at a time to use direct control mode.

D. The message window will report any status messages that occur while interfacing with the module.

544CRP Physical Device

This module has six relays. This would be a good place to include their ratings and the ratings of the module itself (i.e. its connector).

3.16 544CRP Tutorial

Note: This requires a CAN-USB adapter and 541CEI module.

1. Connect the 541CEI module to the PC via CAN to USB adapter.

2. Open CANconnect and click Request Broadcast. The attached module should show up in the Modules section. Double-click the module to open the editing interface.

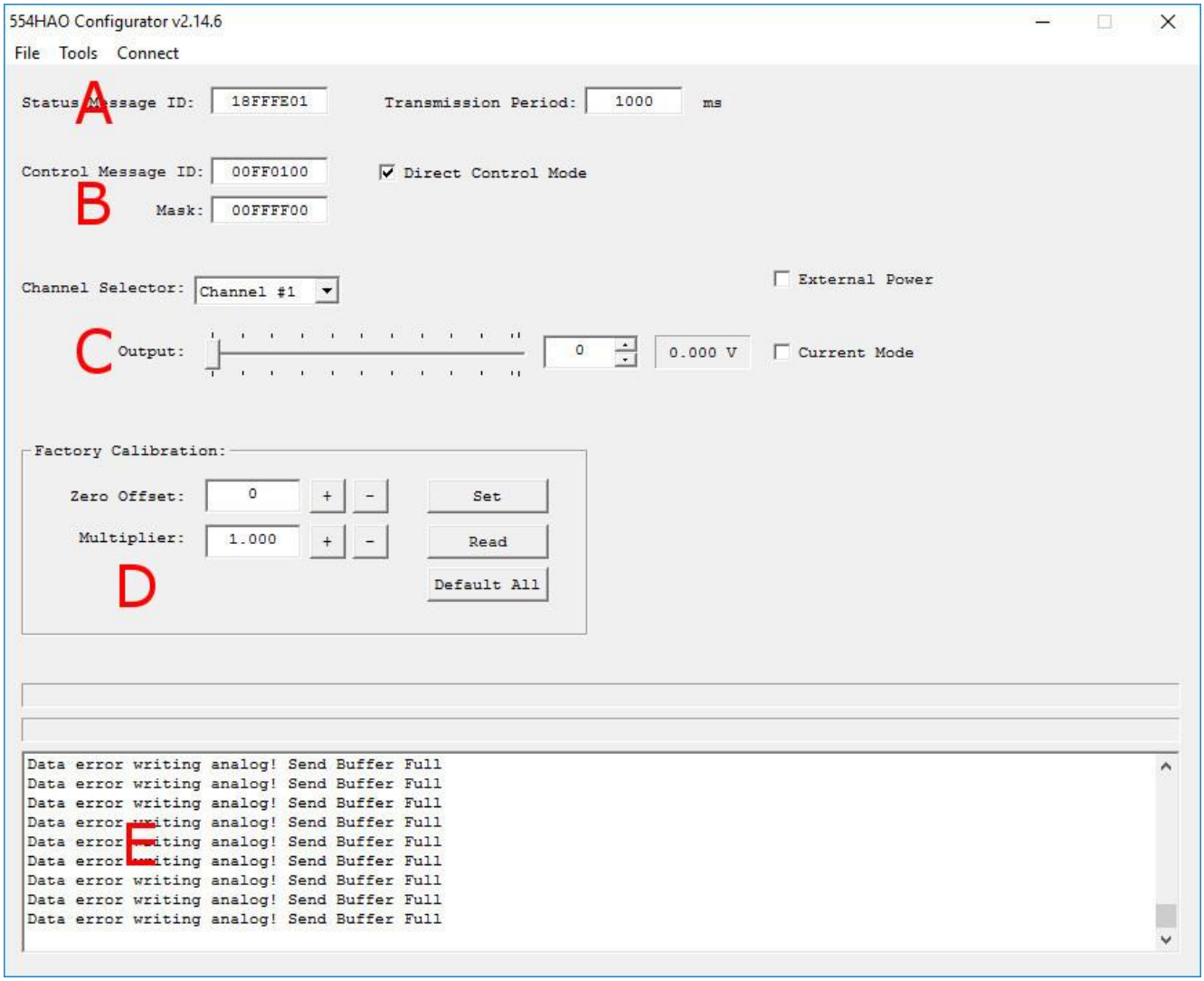
3. Go to Connect and interrogate Module. In the information message field, the address of the module, the model, and firmware version are listed.

4. Set the desired CAN status message ID and transmit period.

5. Set the desired CAN control message ID and mask.

6. Go to Connect->Write Design to load the design into the module.

3.17 554HAO Interface



Interface Toolbar:

File

New - Reset all interface values to their defaults.

Close - Close the interface window.

Tools

Open Diagnostics Window... - For factory use only.

Connect

Interrogate Module - Return the device address and version information.

Write Design - Export the newly created design to the device.

Verify Design - Ensure that the correct design is loaded on the device.

Read Design - Import the design currently stored on the device.

> **Note:** If bad response messages occur, check connections and retry.

Read Diagnostics - For factory use only.

Interface Workspace:

A. Define the status message CAN ID and its transmission period. Bytes #1 to #6 report the status of the analog outputs as 8-bit scaled values. (255=100%) Byte #7 is the firmware major version number and byte #8 is the firmware minor version number.

B. Define the control message CAN ID and mask. Byte #1 specifies the analog channel to write to. (0=Channel #1) Byte #2 is the low byte of the analog output value and byte #3 is the high byte. The maximum value of the DAC is 4095. The direct control option will allow you to control the module without it being programmed, but can only be used with one module connected to the bus at a time.

C. This section allows you to control the analog output for testing. You can also change the "External Power" for all channels, and the "Current Mode" option for each individual channel.

D. The factory calibration should only be used by the factory. It calibrates the output of the module to within its rated accuracy.

E. The message window will report any status messages that occur while interfacing with the module.

554HAO Physical Device

The module features six analog outputs that can be defined as either 0 – 10V voltage or 4-20mA current outputs.

3.18 554HAO Tutorial

Note: This requires a CAN-USB adapter and 541CEI module.

1. Connect the 541CEI module to the PC via CAN to USB adapter.

2. Open CANconnect and click Request Broadcast. The attached module should show up in the Modules section. Double-click the module to open the editing interface.

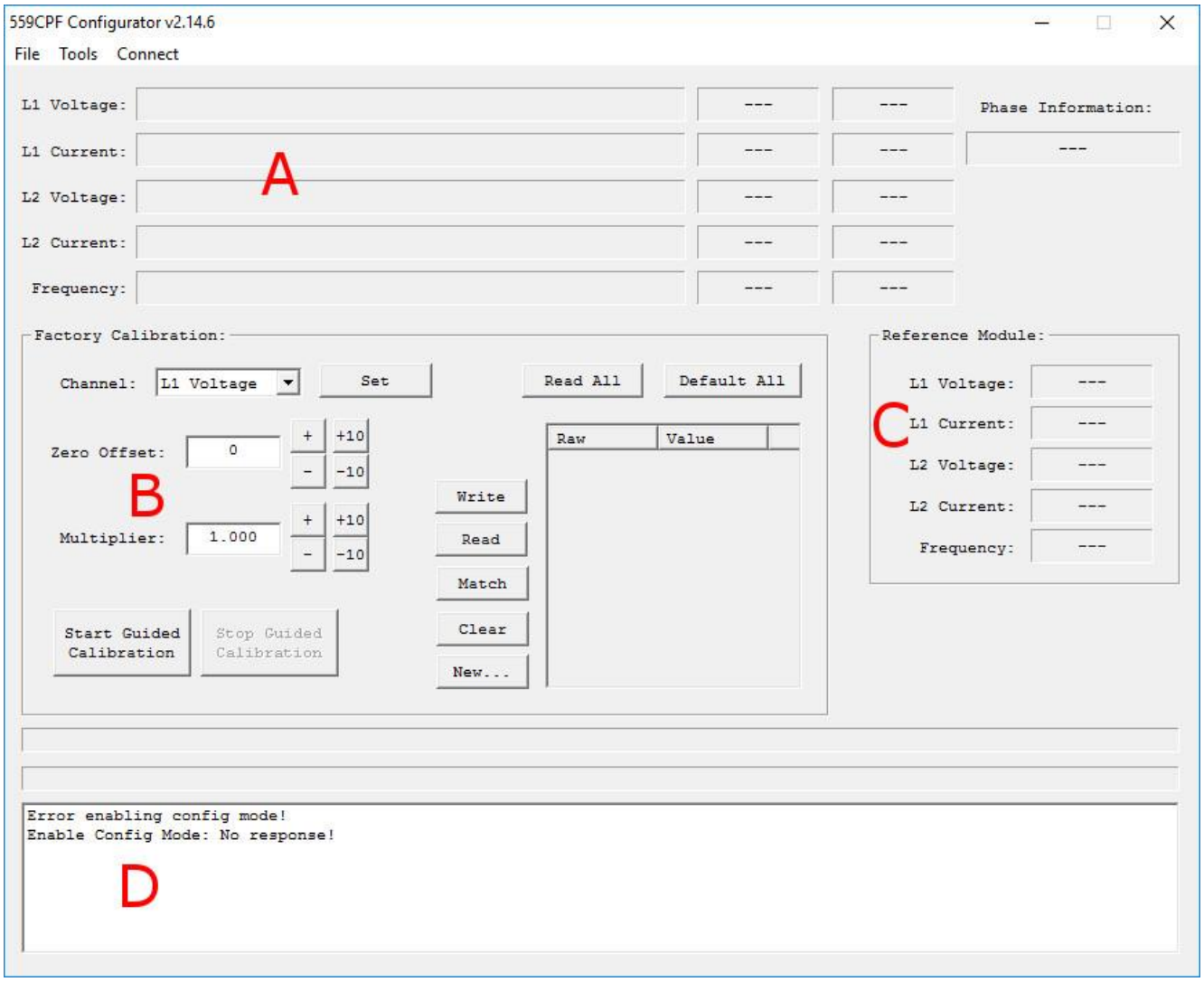
3. Go to Connect and interrogate Module. In the information message field, the address of the module, the model, and firmware version are listed.

4. Set the desired CAN status message ID and transmit period.

5. Set the desired CAN control message ID and mask.

6. Go to Connect->Write Design to load the design into the module.

3.19 559CPF Interface



Interface Toolbar:

File

New - Reset all interface values to their defaults.

Close - Close the interface window.

Tools

Open Diagnostics Window... - For factory use only.

Connect

Interrogate Module - Return the device address and version information.

Write Design - Export the newly created design to the device.

Verify Design - Ensure that the correct design is loaded on the device.

Read Design - Import the design currently stored on the device.

Note: If bad response messages occur, check connections and retry.

Read Diagnostics - For factory use only.

Interface Workspace:

A. This shows the active readings of the module's voltage, current, and frequency readings. It also shows the current phase information of L1 and L2.

B. The factory calibration should only be used by the factory. It calibrates the inputs of the module to within its rated accuracy.

C. For factory calibration only, the reference module is used to calibrate the module's inputs.

D. The message window will report any status messages that occur while interfacing with the module.

559CPF Physical Device

The 559CPF can read voltage and current off of two AC lines. It will also read the frequency of L1, as well as detect the phase difference of L1 and L2. This would be a good place to include the maximum ratings of the module.

3.20 559CPF Tutorial

Note: This requires a CAN-USB adapter and 541CEI module.

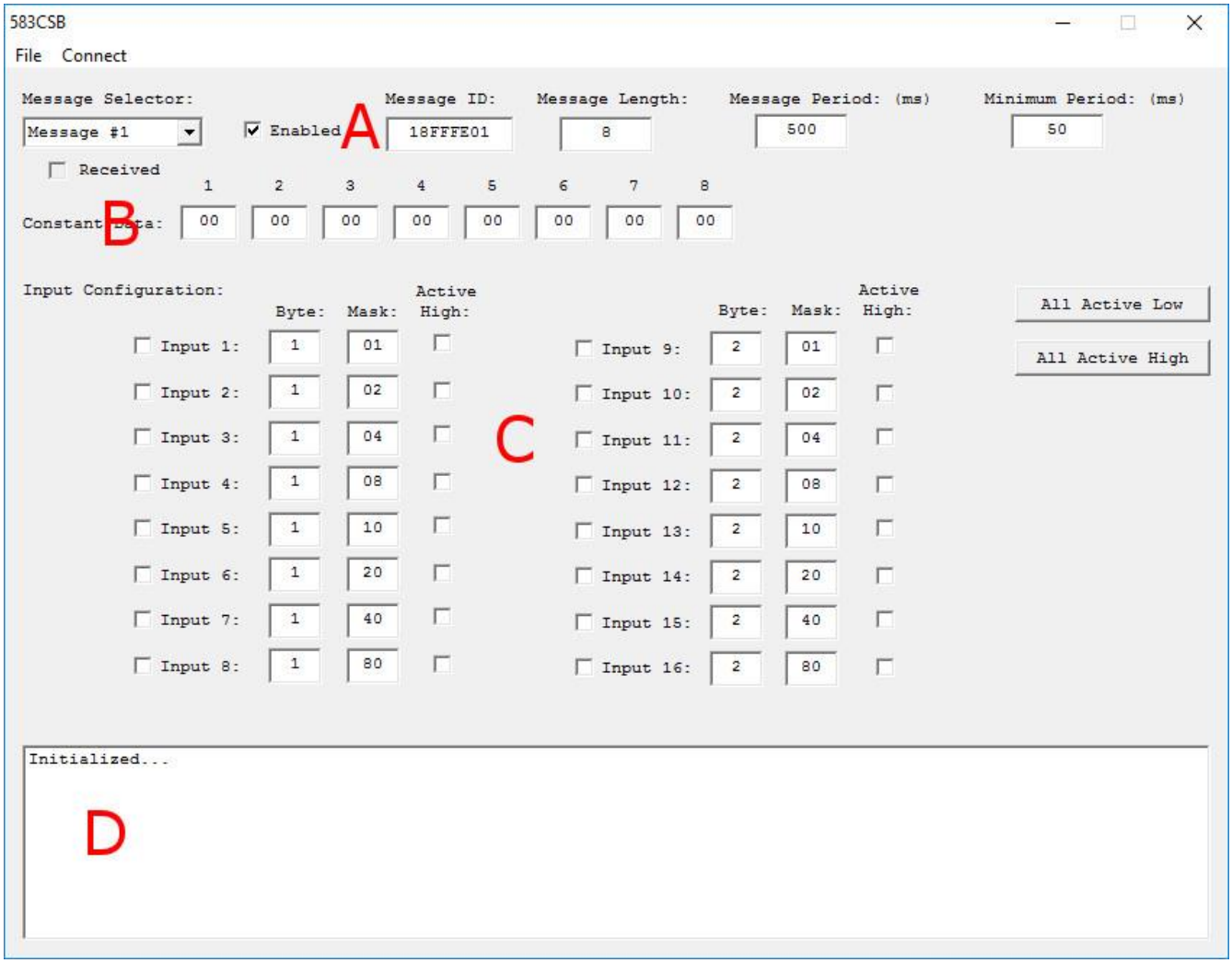
1. Connect the 541CEI module to the PC via CAN to USB adapter.

2. Open CANconnect and click Request Broadcast. The attached module should show up in the Modules section. Double-click the module to open the editing interface.

3. Go to Connect and interrogate Module. In the information message field, the address of the module, the model, and firmware version are listed.

4. The 559CPF module does not require configuration and will automatically transmit the voltage, current, and frequency readings at the RVC standard messages 0x01FFAD00 and 0x01FFAB00.

3.21 583CSB Interface



Interface Toolbar:

File

New - Reset all interface values to their defaults.

Close - Close the interface window.

Connect

Interrogate Module - Return the device address and version information.

Write Design - Export the newly created design to the device.

Verify Design - Ensure that the correct design is loaded on the device.

Read Design - Import the design currently stored on the device.

Note: If bad response messages occur, check connections and retry.

Read Diagnostics - For factory use only.

Interface Workspace:

A. Here is specified up to two message transmitted by the module. You can specify the message ID and length, the transmit period, and the maximum "on change" transmit period.

B. This is the optional constant data in the defined message that does not change.

C. Here is defined which byte and the bit mask that corresponds with each input. You can also define whether the input is active high or low. The check boxes will indicate the present status of the input if the message is being received.

D. The message window will report any status messages that occur while interfacing with the module.

583CSB Physical Device

This module supports sixteen active high or low digital inputs.

3.22 583CSB Tutorial

Note: This requires a CAN-USB adapter and 541CEI module.

1. Connect the 541CEI module to the PC via CAN to USB adapter.

2. Open CANconnect and click Request Broadcast. The attached module should show up in the Modules section. Double-click the module to open the editing interface.

3. Go to Connect and interrogate Module. In the information message field, the address of the module, the model, and firmware version are listed.

4. Set the desired message ID in the Message ID field.

5. Set the desired number of bytes in the message in the Message Length field.

6. Set the desired message period (maximum time between transmits) in the Message Period field.

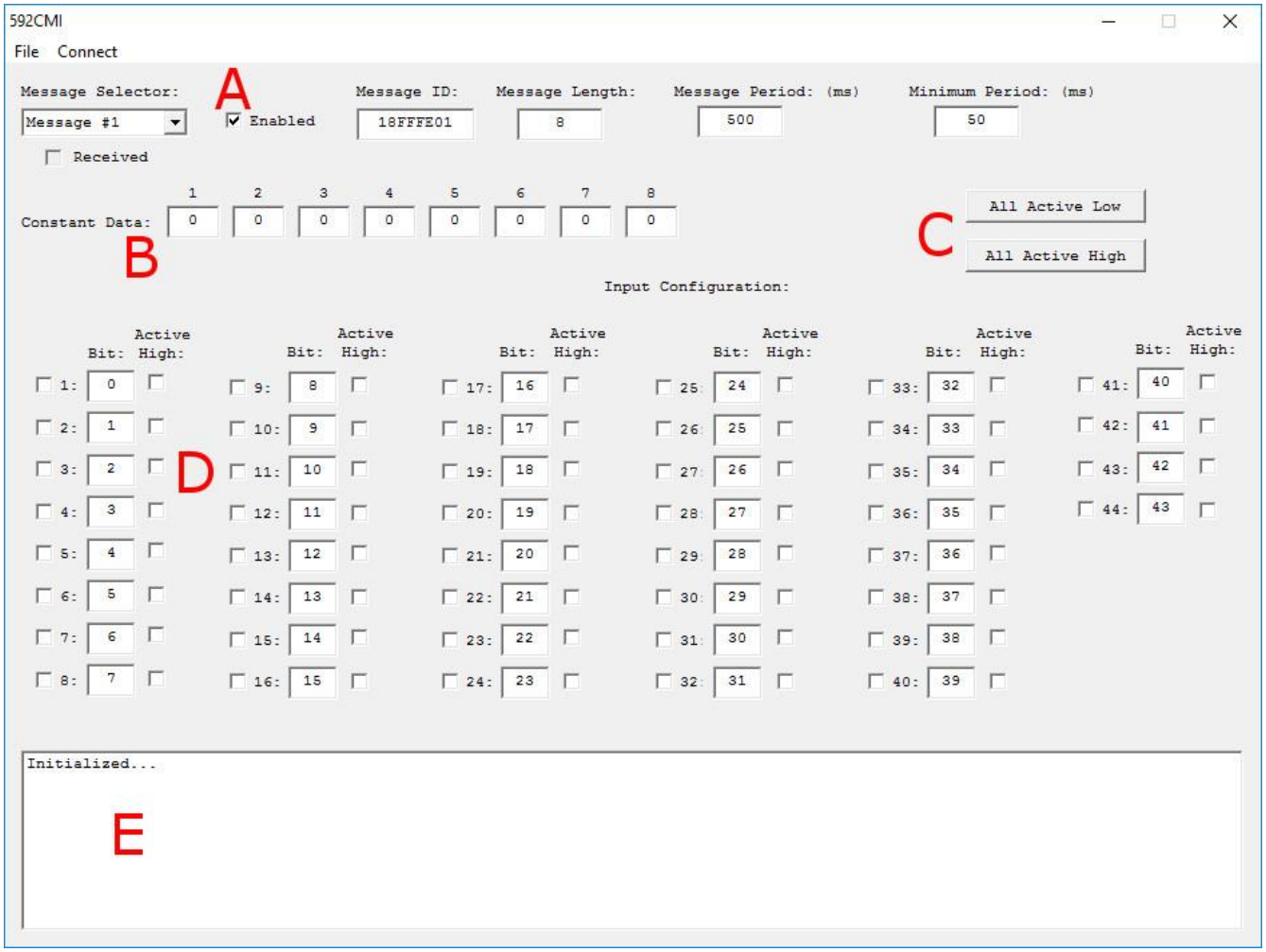
7. Set the designed minimum period (minimum time between transmits if the inputs change) in the Minimum Period field.

8. Set any required constant data fields in the Constant Data section.

9. The bytes and bits that will change for each input can be set in the Input Configuration. The default configuration can be used to transmit inputs #1-#8 in byte #1 and inputs #9-#16 in byte #2.

10. Select Connect->Write Design to write the design to the module.

3.23 592CMI Interface



Interface Toolbar:

File

New - Reset all interface values to their defaults.

Close - Close the interface window.

Connect

Interrogate Module - Return the device address and version information.

Write Design - Export the newly created design to the device.

Verify Design - Ensure that the correct design is loaded on the device.

Read Design - Import the design currently stored on the device.

Note: If bad response messages occur, check connections and retry.

Read Diagnostics - For factory use only.

Interface Workspace:

A. Here is specified up to two message transmitted by the module. You can specify the message ID and length, the transmit period, and the maximum "on change" transmit period.

B. This is the optional constant data in the defined message that does not change.

C. Use these buttons to quickly set all inputs active high or low.

D. Shows the status of each input if the message is being received. Allows you to configure whether the input is active high or low. Defines which bit in the message corresponds with each input. For example, bit 0 indicates the lowest bit of byte #1. Bit 7 indicates the highest bit of byte #1. Bit 40 indicates the lowest bit of Byte #6.

E. The message window will report any status messages that occur while interfacing with the module.

592CMI Physical Device

This module supports 44 active high or low digital inputs.

3.24 592CMI Tutorial

Note: This requires a CAN-USB adapter and 541CEI module.

1. Connect the 541CEI module to the PC via CAN to USB adapter.

2. Open CANconnect and click Request Broadcast. The attached module should show up in the Modules section. Double-click the module to open the editing interface.

3. Go to Connect and interrogate Module. In the information message field, the address of the module, the model, and firmware version are listed.

4. Set the desired message ID in the Message ID field.

5. Set the desired number of bytes in the message in the Message Length field.

6. Set the desired message period (maximum time between transmits) in the Message Period field.

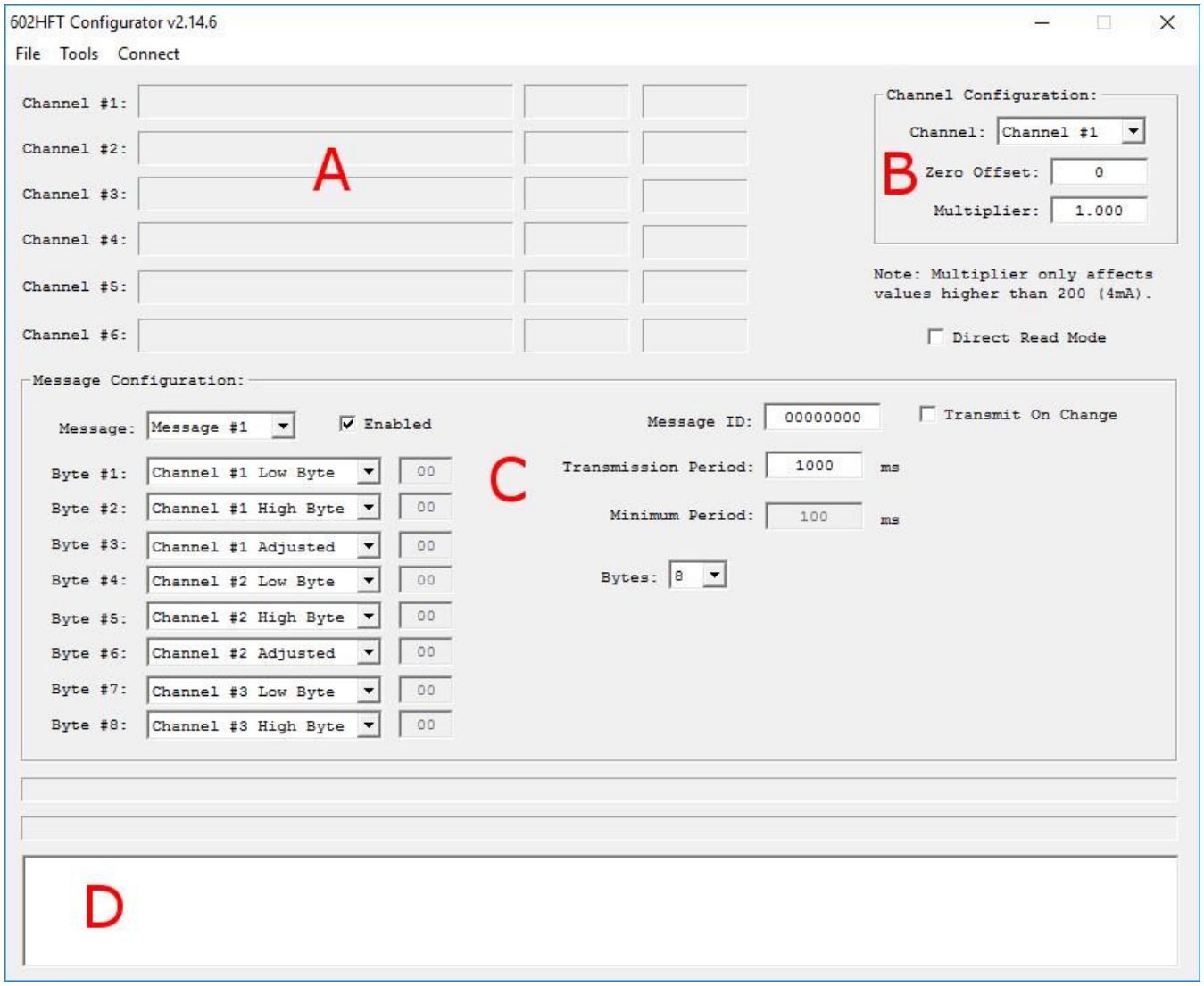
7. Set the designed minimum period (minimum time between transmits if the inputs change) in the Minimum Period field.

8. Set any required constant data fields in the Constant Data section.

9. The message bit that will toggle with each input can be set in the Input Configuration setting. The default configuration will place all 44 inputs in order in the first 6 bytes, with only the first 4 bits of the 6^{th} byte being used.

10. Select Connect->Write Design to write the design to the module.

3.25 602HFT Interface



Interface Toolbar:

File

New - Reset all interface values to their defaults.

Close - Close the interface window.

Tools

Open Diagnostics Window... - For factory use only.

Open Factory Calibration... - For factory use only.

Connect

Interrogate Module - Return the device address and version information.

Write Design - Export the newly created design to the device.

Verify Design - Ensure that the correct design is loaded on the device.

Read Design - Import the design currently stored on the device.

Note: If bad response messages occur, check connections and retry.

Read Diagnostics - For factory use only.

Interface Workspace:

A. Shows the present values of the six analog 4-20mA inputs. Direct read mode allows you to read the module without first programming it. Only works if the 602HFT is the only module on the CAN bus.

B. User configurable zero offset the multiplier values. The zero offset is applied first, then the multiplier.

C. Allows you to define up to five messages transmitted by the module. The user can specify the CAN message ID, the transmit period, and the transmit on change period. The user can define the number of bytes in the message, as well as which bytes correspond to which analog input channel.

D. The message window will report any status messages that occur while interfacing with the module.

602HFT Physical Device

The 602HFT has six 4-20mA analog inputs.

3.26 602HFT Tutorial

Note: This requires a CAN-USB adapter and 602HFT module.

1. Connect the 602HFT module to the PC via CAN to USB adapter.

2. Open CANconnect and click Request Broadcast. The attached module should show up in the Modules section. Double-click the module to open the editing interface.

3. Go to Connect and interrogate Module. In the information message field, the address of the module, the model, and firmware version are listed.

4. Set the desired message ID in the Message ID field.

5. Set the desired transmission period in the Transmission Period field.

6. Check the Transmit On Change check box if that functionality is desired. The desired minimum period should then be set.

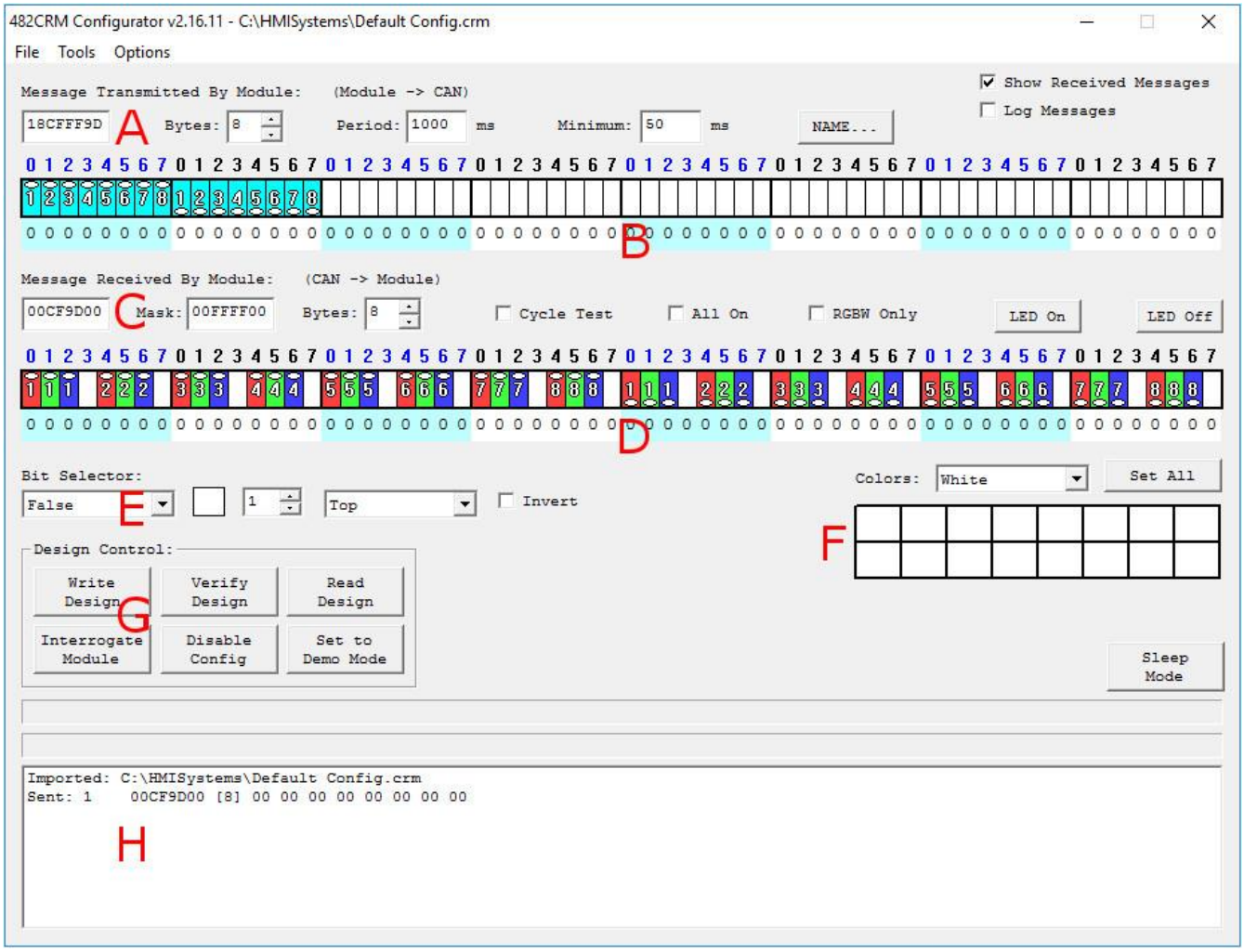
7. Set the number of bytes desired in the message with the Bytes drop down box.

8. The default configuration will transmit the first four inputs in the eight bytes of the first message, with each channel being assigned two bytes.

9. The first message can be reconfigured to transmit only 8-bit values to fit all 6 inputs in the first message, or a 2nd message can be defined to contain the full 16-bit values of inputs #5 and #6.

10. Click on Connect->Write Design to write the design to the module.

3.27 606PKP Interface



(The 606PKP Configurator window is similar to the 482CRM's.)

Interface Toolbar:

File

New - Open a new .crm file.

Import... - Import a previously created .crm file.

Export... - Export the current 606PKP configuration as a .crm file.

Close - Close the interface window.

Tools

Open Diagnostics Window... - Test and verify that components are working correctly.

Open Burn In Window... - For factory use only.

Read Diagnostics - For factory use only.

Rotate Switch 180 - Change switch assignments from low to high byte and from high to low.

Invert Received - Swap each switch's top and bottom setting.

Options

Read Only Mode - Prevent editing.

Reverse Displayed Bit Order - Change the bit order from 0-> 7 to 7->0.

Interface Workspace:

A. The Message Transmitted By Module section is where the information to be transmitted is specified. The first text field includes the destination address in the CAN system. The Bytes field specifies how many bytes. The Period field specifies how often the information is being sent in milliseconds. The Minimum field is the fastest the data can be sent when transmitting on change. The NAME button opens a new window that edits the message that will be transmitted when the module powers up.

B. This bar is the visual representation of the bytes being transmitted. Each byte is broken down into each of its eight bits. The individual bits within each byte can be changed to be associated with a certain switch, and/or switch position, that the receiving CAN module can decode.

C. The Message Received By Module section is where the address and mask can be set in order to listen to the correct module. The number of bytes to use may also be specified as well as how the LEDs are to be configured in order to test functionality.

D. This bar is a visual representation of the bytes received and what the significance of each bit has for the LEDs on the module. Using the tools below, LEDs can be set to a variety of colors and locations (top or bottom LED on a switch).

E. The Bit Selector includes False, True, Switch, LED, Enable, Power, Enable All, Power All, Red LED, Green LED, and Blue LED. Each selector affects the switches in a different way, with some being associated with a specific color (seen in the square next to the drop down menu). The number field is the Switch Selector and can be set between 1 and 8 with each representing a switch on the module, from left to right, starting with 1. For example, set the value as 2, select the Red LED drop-down option, and select a byte. The byte value will show as 2, meaning switch 2. The drop-down menu with the options Top and Bottom is the Row Selector and can be used to select the

top or bottom LED on the switch. Checking the Invert box will set the LED to be true on 0 instead of 1.

False - This bit will always transmit as a 0. It has no effect on received messages.

True - This bit will always transmit as a 1. It has no effect on received messages.

Switch - This represents the status of a switch. Use the Switch Selector to select one of the eight switches, and the Row Selector to select whether it's the top or bottom switch. It has no effect on received messages.

LED - This is used to control the LED. Use the Switch Selector to select one of the eight switches, and the Row Selector to select whether it's the top or bottom LED. Transmitted messages with LED bits will reflect the status of the last received message.

Enable - A single bit that enables the top or bottom row of LEDs. This control is optional. If no enable bit is specified, the LEDs will default to on. Use Enable All to enable both the top and bottom rows of LEDs with a single bit.

Power - Eight bits for each row represent the power (intensity) of the LEDs. A value of 0 is 0% and a value of 255 is 100%. Any power bits after the first eight will be ignored. If less than eight bits are specified, the least significant bits are filled with the value of the most significant bit (the bits specified are assumed to be the most significant). This control is optional. If no power bits are specified, the LEDs will default to 100% on.

Enable ALL - This enables all switch LEDs.

Power ALL - This sets all switch LED powers to 100%.

Red LED - This sets all switch LEDs to red.

Green LED - This sets all switch LEDs to green.

Blue LED - This sets all switch LEDs to blue.

Output – Controls any auxiliary outputs on the received message and reports their status in the transmit message. Currently only supported by the PKUXX00 series of switch panels.

Feedback – Reports the status of the auxiliary outputs with the value of 1 indicating a fault. This has no effect on the received message. Currently only supported by the PKUXX00 series of switch panels.

F. The Colors drop-down menu has a selection of colors from black to white. The top eight boxes represent the top LEDs on eight switches with the bottom eight boxes representing the bottom LEDs. Using the drop-down

menu, colors can be placed into the boxes. Use the Bit Selector LED option to enable that color in the corresponding bit. This method allows for LED control with two bytes, but limits the LED customization.

G. In the Design Controls box, the design can be programmed onto the module with Write Design. Verify Design allows you to verify the design on the current module. To import the current design from the module, use Read Design. To get the module's address and version information, use Interrogate Module. Disable Config will disable configuration on the module. Set to Demo Mode will put the module into demo mode.

> **Note:** When reading a design, bad response messages may occur. Ensure connections are correct and retry.

H. The Information Message section indicates what actions have occurred and may be currently executing. Any errors or successful read, write, and verify messages will be shown in this message section.

606PKP Physical Device

This module is 482CRM style firmware for DSS PKP2X00 hardware.

3.28 606PKP Tutorial

> **Note:** This requires a CAN-USB adapter and 606PKP module.

1. Connect the 606PKP module to the PC via a CAN to USB adapter.

2. Open CANconnect and click Request Broadcast. The attached module should show up in the Modules section. Double-click the module to open the editing interface.

3. Click the Interrogate Module button. In the information message field, the address of the module, the model, and firmware version are listed.

4. Under Message Transmitted By Module, set the ID field as "18EFFF94". Set Bytes at 8, Period to 1000ms, and Minimum to 100ms.

> **Note:** This Message ID is for illustrative purposes only and can be set to whatever works with your system.

5. For the Byte/Bit representation field, use the Bit Selector drop down menu to select Switch with the value 1 and Top in the corresponding fields. Click in bit 0 of Byte 1. A light blue box should show up with "1" inside and a white oval at

the top. Change the value under Bit Selector to 2. Click bit 1 of Byte 1. Repeat until all 8 bits are filled in Byte 1. The last should be switch 8 in bit 7.

6. For Byte 2, repeat step 5 except change the Top property to Bottom. Leave Bytes 3 to 8 blank.

7. Under Message Received By Module, set the ID field as "18EFFF93" and Mask as "1FFFFFFF". Leave Bytes as 8 and Cycle Test unchecked.

> **Note:** This Message ID is for illustrative purposes only and can be set to whatever works with your system.

8. Use the Bit Selector to pick Red LED, set the value as 1 and drop-down menu to Top. Click the bit 0 in Byte 1 of the receiving message. Increment the value to 2 and click bit 1 in Byte 1. Repeat up to value 8 for bit 7.

9. Change the property to Bottom and repeat step 8 for Byte 2.

10. Change the Bit Selector to Green LED and repeat step 8 for Byte 3. Then change the property to Bottom and fill in Byte 4.

11. Change the Bit Select to Blue LED and repeat step 8 for Byte 5. Then change property to Bottom and fill in Byte 6.

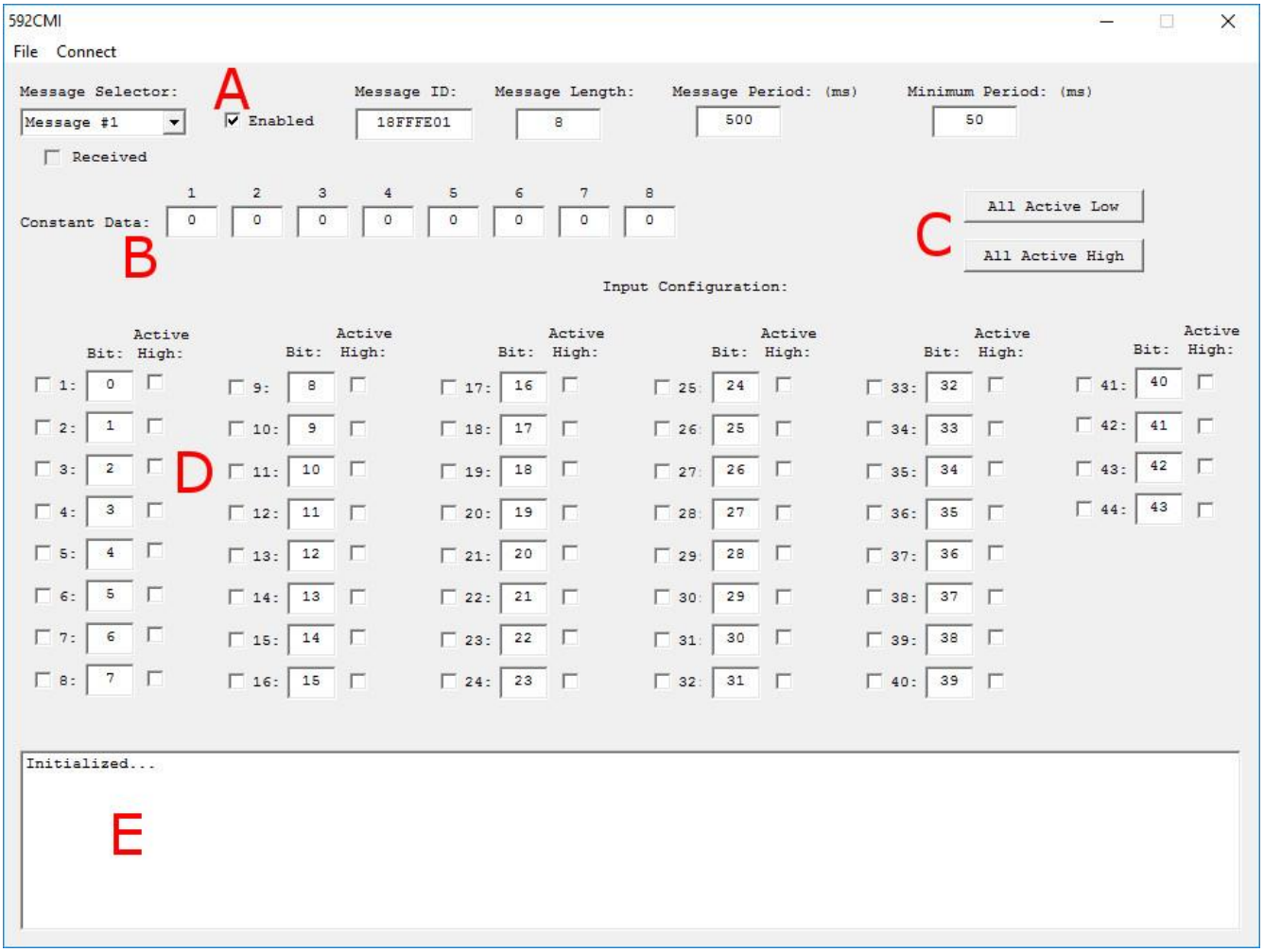
12. Next, use the Bit Selector to pick Enable All. Click bit 0 in Byte 7. A yellow box with two white ovals should be placed.

13. Return to the Bit Selector and change to Power. Make sure the top property is active. Click on bits 0 to 3 in Byte 8. Purple boxes should be placed with top ovals. For bits 4 to 7, use Power with Bottom property active.

14. Click the Write Design button. The module is now programmed.

15. OPTIONAL: Follow the Post-Test Setup instructions to test the newly edited 606PKP.

3.29 614DCI Interface



(The 614DCI configuration window is similar to the 592CMI's.)

Interface Toolbar:

File

New - Reset all interface values to their defaults.

Close - Close the interface window.

Connect

Interrogate Module - Return the device address and version information.

Write Design - Export the newly created design to the device.

Verify Design - Ensure that the correct design is loaded on the device.

Read Design - Import the design currently stored on the device.

Note: If bad response messages occur, check connections and retry.

Read Diagnostics - For factory use only.

Interface Workspace:

A. Here is specified up to two message transmitted by the module. You can specify the message ID and length, transmit period, and the maximum "on change" transmit period.

B. This is the optional constant data in the defined message that does not change.

C. Use these buttons to quickly set all inputs active high or low.

D. Shows the status of each input if the message is being received. Allows you to configure whether the input is active high or low. Defines which bit in the message corresponds with each input. For example, bit 0 indicates the lowest bit of byte #1. Bit 7 indicates the highest bit of byte #1. Bit 40 indicates the lowest bit of Byte #6.

E. The message window will report any status messages that occur while interfacing with the module.

614DCI Physical Device

This module supports 44 active high or low digital inputs.

3.30 614DCI Tutorial

Note: This requires a CAN-USB adapter and 614DCI module.

1. Connect the 614DCI module to the PC via CAN to USB adapter.

2. Open CANconnect and click Request Broadcast. The attached module should show up in the Modules section. Double-click the module to open the editing interface.

3. Go to Connect and interrogate Module. In the information message field, the address of the module, the model, and firmware version are listed.

4. Set the desired message ID in the Message ID field.

5. Set the desired number of bytes in the message in the Message Length field.

6. Set the desired message period (maximum time between transmits) in the Message Period field.

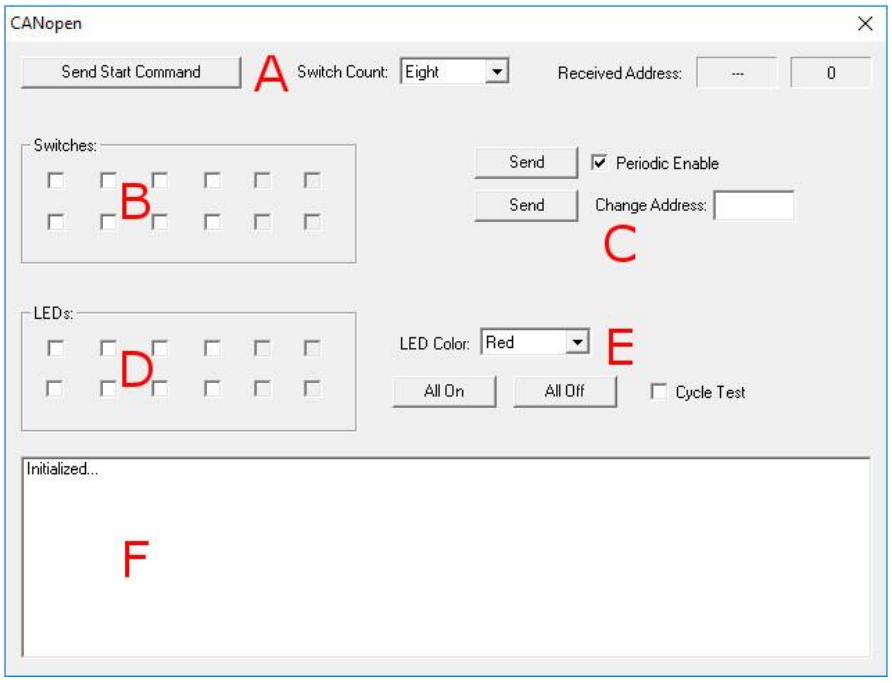
7. Set the designed minimum period (minimum time between transmits if the inputs change) in the Minimum Period field.

8. Set any required constant data fields in the Constant Data section.

9. The message bit that will toggle with each input can be set in the Input Configuration setting. The default configuration will place all 44 inputs in order in the first 6 bytes, with only the first 4 bits of the 6th byte being used.

10. Select Connect->Write Design to write the design to the module.

3.31 CANopen Interface



Interface Workspace:

A. Select the number of switches the module has to test.

B. Indicates which switches are pressed (set automatically by the software).

C. Periodic Enable enables the periodically transmitted messages. Change Address changes the CANopen address of the module. Click the corresponding Send button to send the message that commits the change to the module.

D. Turn individual LEDs on and off (controlled by the user).

E. Select what color to set the LEDs to. All On and All Off are utility functions to set all of the LEDs at once. Cycle Test will automatically cycle the LED colors.

3.32 CANopen Tutorial

Note: This requires a CAN-USB adapter and a CAN enabled module.

1. Connect the CAN enabled module to the PC via CAN to USB adapter.

2. Open CANconnect and click Request Broadcast. The attached module should show up in the Modules section. Double-click the module to open the editing interface.

3. Go to Connect and interrogate Module. In the information message field, the address of the module, the model, and firmware version are listed.

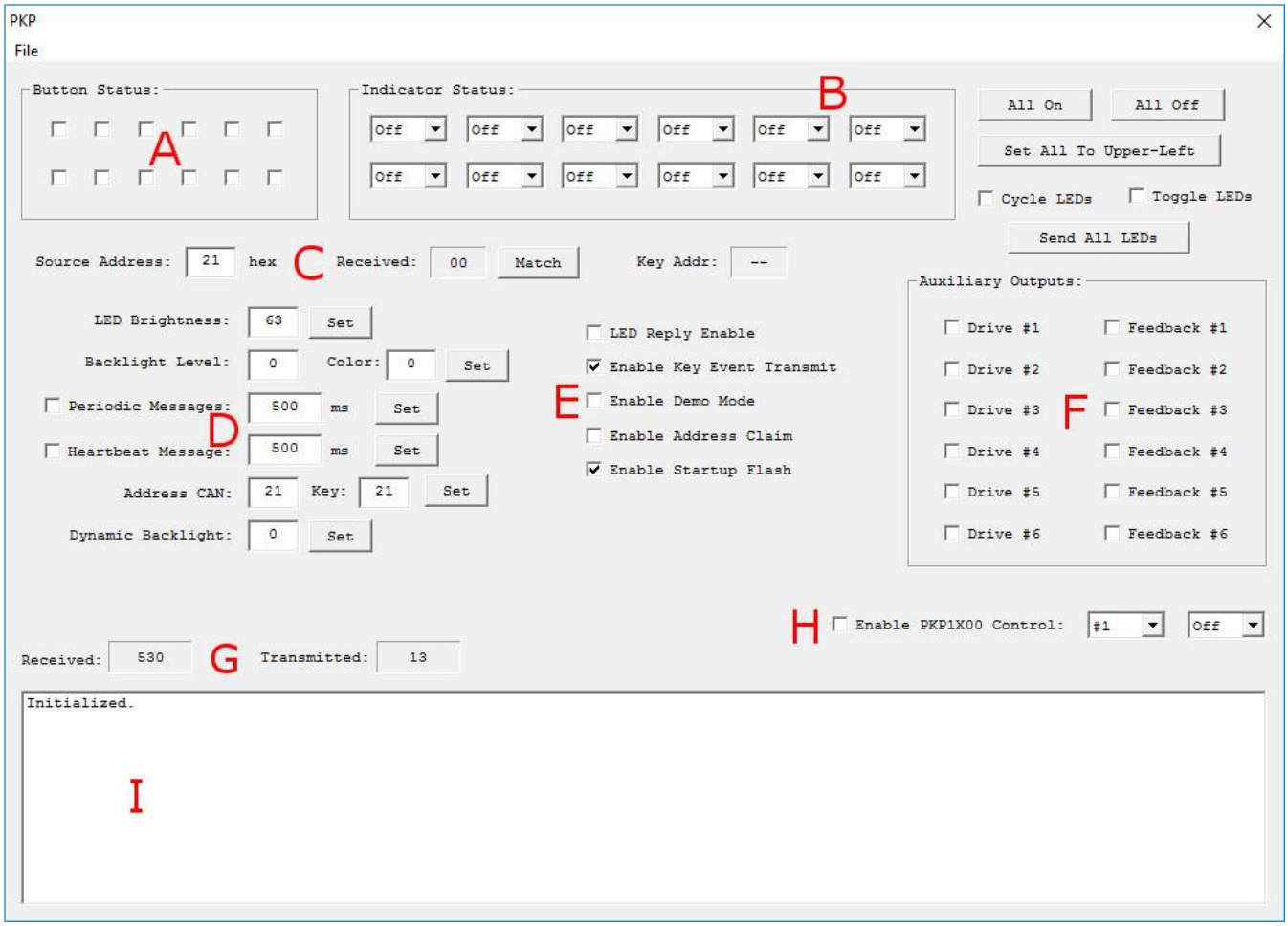
4. Set the number of switches on the module.

5. Click the Send Start Command.

6. Press each switch and check for communication in the Switches box.

7. Enable each LED and ensure the correct color lights.

3.33 PKP Interface



Interface Toolbar:

File

Close - Close the interface window.

Interface Workspace:

A. The Button Status section will indicate which switches are pressed. This area is controlled by the software.

B. The Indicator Status section will set the colors of the LEDs. This section is controllable by the user. All On will turn all the LEDs on. All Off will turn all the LEDs off. Set All To Upper-Left will change all the LEDs to whatever the upper-left LED is set to. Cycle LEDS will cause the LEDs to cycle through their colors. Toggle LEDs will cause all the LEDs to turn on and off again.

C. Source Address is the address that the interface will send out commands on. Received address is the address that the software is receiving messages at. The Match button will set the source address to the received address. Key Addr is the key address of the received message, which is not use by the test interface but can be set below.

D. Use the Set buttons to send the value to the module and commit the change. LED Brightness controls the primary LED brightness value, with 63 being the maximum value for 100% brightness. Color sets the backlight color (see table below). Periodic Messages enables the periodic message and controls the rate at which it is sent. Heartbeat Message enables the heartbeat message and controls the rate at which it is sent. Address CAN and Key allows you to change the address of the module.

> **Note:** The Key address can also be set, but it is not used by this interface. The address can only be changed if the source address field matches the current address of the module. Once the address is changed, the source address must be changed to match in order to keep communicating with the module.

The Dynamic Backlight command allows you to change the backlight brightness on the module without saving it (The backlight setting will be reverted when power is reset to the module).

Colors:

0 - Red
1 - Green
2 - Amber
3 - Blue
4 - Cyan
5 - Magenta
6 - White

E. LED Reply Enable enables and acknowledges messages that are sent by the module any time the LED state is changed. Enable Key Event Transmit enables a message to be sent any time the user presses or releases a push button on the module. Enable Demo Mode puts the module into demo mode which is a preview mode that allows the module to demonstrate some of its functionality without being connected to other hardware. Enable Address Claim causes the module to transmit a CAN bus address claim message on power up indicating which address it is programmed to. Enable Startup Flash causes the module to flash its LEDs when the module powers on.

F. The Auxiliary Output controls provide an interface for controlling the module’s auxiliary outputs. The Drive column is controlled by the user and turns the auxiliary output on and off. The Feedback column is controlled by the software and indicates the feedback status of each output. The feedback

signal going true indicates an overload on the output and will not be cleared until the output is turned off.

G. Indicates the number of CAN messages received and transmitted by the interface.

H. Enables the special interface for controlling the PKP1X00 series of modules, which have more than 16 LED indicators.

I. Message status window which shows the results of various commands.

PKP Physical Device

The PowerKey Pro keypad utilizes push buttons and LEDs.

3.34 PKP Tutorial

Note: This requires a CAN-USB adapter and PKP module.

1. Connect the PKP module to the PC via CAN to USB adapter.

2. Open CANconnect and click Request Broadcast. The attached module should show up in the Modules section. Double-click the module to open the editing interface.

3. Go to Connect and interrogate Module. In the information message field, the address of the module, the model, and firmware version are listed.

4. Under Message Transmitted By Module, set the ID field as "18EFFF94". Set Bytes at 8, Period to 1000ms, and Minimum to 100ms.

Note: This Message ID is for illustrative purposes only and can be set to whatever works with your system.

5. For the Byte/Bit representation field, use the Bit Selector drop down menu to select Switch with the value 1 and Top in the corresponding fields. Click in bit 0 of Byte 1. A light blue box should show up with "1" inside and an white oval at the top. Change the value under Bit Selector to 2. Click bit 1 of Byte 1. Repeat until all 8 bits are filled in Byte 1. The last should be switch 8 in bit 7.

6. For Byte 2, repeat step 5 except change the Top property to Bottom. Leave Bytes 3 to 8 blank.

7. Under Message Received By Module, set the ID field as "18EFFF93" and Mask as "1FFFFFFF". Leave Bytes as 8 and Cycle Test unchecked.

> **Note:** This Message ID is for illustrative purposes only and can be set to whatever works with your system.

8. Use the Bit Selector to pick Red LED, set the value as 1 and drop-down menu to Top. Click the bit 0 in Byte 1 of the receiving message. Increment the value to 2 and click bit 1 in Byte 1. Repeat up to value 8 for bit 7.

9. Change the property to bottom and repeat step 8 for Byte 2.

10. Change the Bit Selector to Green LED and repeat step 8 for Byte 3. Then change the property to bottom and fill in Byte 4.

11. Change the Bit Select to Blue LED and repeat step 8 for Byte 5. Then change the property to bottom and fill in Byte 6.

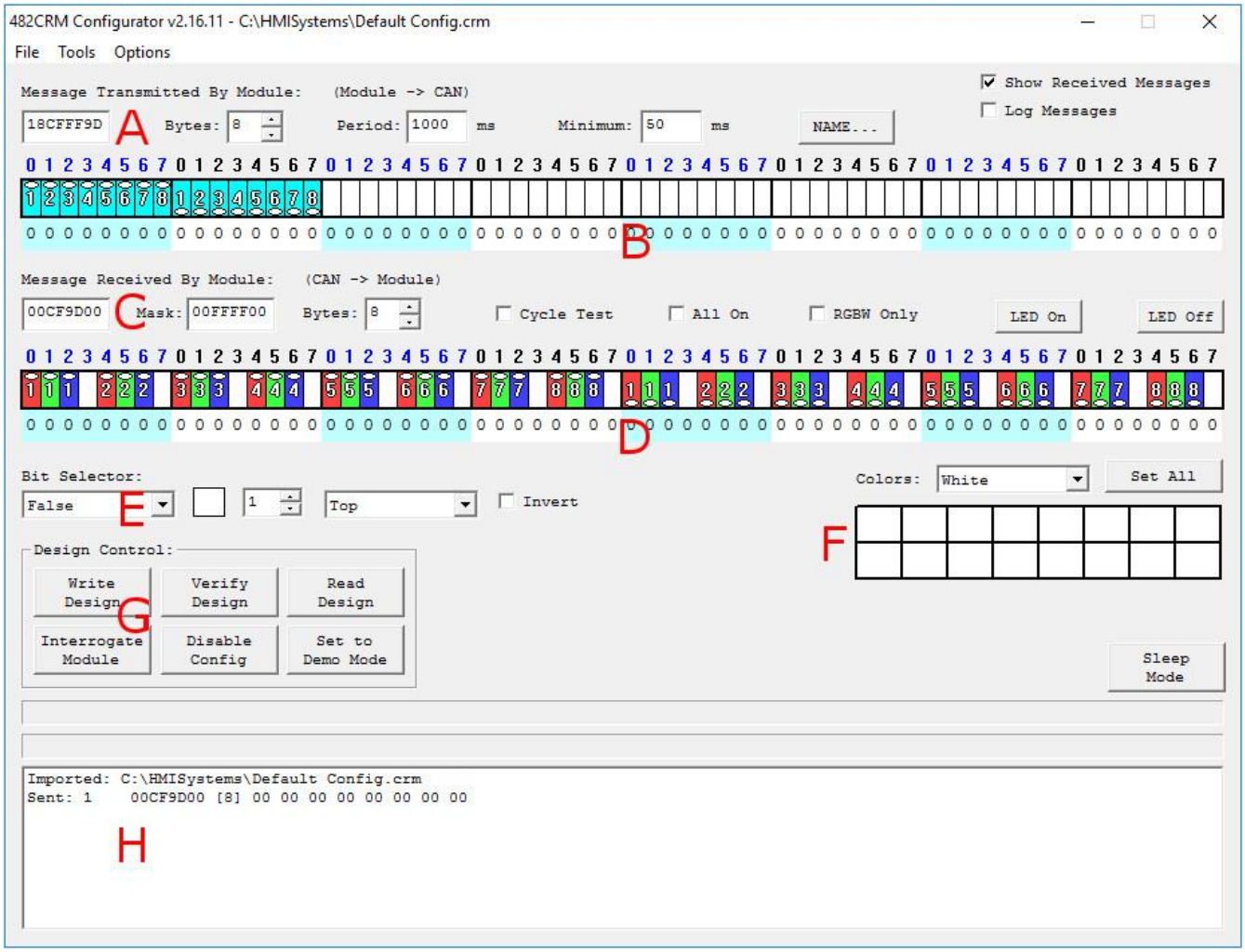
12. Next, use the Bit Selector to pick Enable All. Click bit 0 in Byte 7. A yellow box with two white ovals should be placed.

13. Return to the Bit Selector and change to Power. Make sure the top property is active. Click on bits 0 to 3 in Byte 8. Purple boxes should be placed with top ovals. For bits 4 to 7, use Power with bottom property active.

14. Go to Connect and Write Design. The module is now programmed.

15. OPTIONAL: Follow the Post-Test Setup instructions to test the newly edited PKP.

3.35 PKUXX00 Interface



(The PKUXX00 Configurator window is similar to the 482CRM's.)

Interface Toolbar:

File

New - Open a new .crm file.

Import... - Import a previously created .crm file.

Export... - Export the current 606PKP configuration as a .crm file.

Close - Close the interface window.

Tools

Open Diagnostics Window... - Test and verify that components are working correctly.

Open Burn In Window... - For factory use only.

Read Diagnostics - For factory use only.

Rotate Switch 180 - Change switch assignments from low to high byte and from high to low.

Invert Received - Swap each switch's top and bottom setting.

Options

Read Only Mode - Prevent editing.

Reverse Displayed Bit Order - Change the bit order from 0-> 7 to 7->0.

Interface Workspace:

A. The Message Transmitted By Module section is where the information to be transmitted is specified. The first text field includes the destination address in the CAN system. The Bytes field specifies how many bytes. The Period field specifies how often the information is being sent in milliseconds. The Minimum field is the fastest the data can be sent when transmitting on change. The NAME button opens a new window that edits the message that will be transmitted when the module powers up.

B. This bar is the visual representation of the bytes being transmitted. Each byte is broken down into each of its eight bits. The individual bits within each byte can be changed to be associated with a certain switch, and/or switch position, that the receiving CAN module can decode.

C. The Message Received By Module section is where the address and mask can be set in order to listen to the correct module. The number of bytes to use may also be specified as well as how the LEDs are to be configured in order to test functionality.

D. This bar is a visual representation of the bytes received and what the significance of each bit has for the LEDs on the module. Using the tools below, LEDs can be set to a variety of colors and locations (top or bottom LED on a switch).

E. The Bit Selector includes False, True, Switch, LED, Enable, Power, Enable All, Power All, Red LED, Green LED, and Blue LED. Each selector affects the switches in a different way, with some being associated with a specific color (seen in the square next to the drop down menu). The number field is the Switch Selector and can be set between 1 and 8 with each representing a switch on the module, from left to right, starting with 1. For example, set the value as 2, select the Red LED drop-down option, and select a byte. The byte value will show as 2, meaning switch 2. The drop-down menu with the options Top and Bottom is the Row Selector and can be used to select the

top or bottom LED on the switch. Checking the Invert box will set the LED to be true on 0 instead of 1.

False - This bit will always transmit as a 0. It has no effect on received messages.

True - This bit will always transmit as a 1. It has no effect on received messages.

Switch - This represents the status of a switch. Use the Switch Selector to select one of the eight switches, and the Row Selector to select whether it's the top or bottom switch. It has no effect on received messages.

LED - This is used to control the LED. Use the Switch Selector to select one of the eight switches, and the Row Selector to select whether it's the top or bottom LED. Transmitted messages with LED bits will reflect the status of the last received message.

Enable - A single bit that enables the top or bottom row of LEDs. This control is optional. If no enable bit is specified, the LEDs will default to on. Use Enable All to enable both the top and bottom rows of LEDs with a single bit.

Power - Eight bits for each row represent the power (intensity) of the LEDs. A value of 0 is 0% and a value of 255 is 100%. Any power bits after the first eight will be ignored. If less than eight bits are specified, the least significant bits are filled with the value of the most significant bit (the bits specified are assumed to be the most significant). This control is optional. If no power bits are specified, the LEDs will default to 100% on.

Enable ALL - This enables all switch LEDs.

Power ALL - This sets all switch LED powers to 100%.

Red LED - This sets all switch LEDs to red.

Green LED - This sets all switch LEDs to green.

Blue LED - This sets all switch LEDs to blue.

Output – Controls any auxiliary outputs on the received message and reports their status in the transmit message. Currently only supported by the PKUXX00 series of switch panels.

Feedback – Reports the status of the auxiliary outputs with the value of 1 indicating a fault. This has no effect on the received message. Currently only supported by the PKUXX00 series of switch panels.

F. The Colors drop-down menu has a selection of colors from black to white. The top eight boxes represent the top LEDs on eight switches with the bottom eight boxes representing the bottom LEDs. Using the drop-down

menu, colors can be placed into the boxes. Use the Bit Selector LED option to enable that color in the corresponding bit. This method allows for LED control with two bytes, but limits the LED customization.

G. In the Design Controls box, the design can be programmed onto the module with Write Design. Verify Design allows you to verify the design on the current module. To import the current design from the module, use Read Design. To get the module's address and version information, use Interrogate Module. Disable Config will disable configuration on the module. Set to Demo Mode will put the module into demo mode.

> **Note:** When reading a design, bad response messages may occur. Ensure connections are correct and retry.

H. The Information Message section indicates what actions have occurred and may be currently executing. Any errors or successful read, write, and verify messages will be shown in this message section.

PKUXX00 Physical Device

The PowerKey Ultra keypad utilizes push buttons and LEDs.

3.36 PKUXXoo Tutorial

> **Note:** This requires a CAN-USB adapter and PKUXX00 module.

1. Connect the PKUXX00 module to the PC via a CAN to USB adapter.

2. Open CANconnect and click Request Broadcast. The attached module should show up in the Modules section. Double-click the module to open the editing interface.

3. Click the Interrogate Module button. In the information message field, the address of the module, the model, and firmware version are listed.

4. Under Message Transmitted By Module, set the ID field as "18EFFF94". Set Bytes at 8, Period to 1000ms, and Minimum to 100ms.

> **Note:** This Message ID is for illustrative purposes only and can be set to whatever works with your system.

5. For the Byte/Bit representation field, use the Bit Selector drop down menu to select Switch with the value 1 and Top in the corresponding fields. Click in bit 0 of Byte 1. A light blue box should show up with "1" inside and a white oval at

the top. Change the value under Bit Selector to 2. Click bit 1 of Byte 1. Repeat until all 8 bits are filled in Byte 1. The last should be switch 8 in bit 7.

6. For Byte 2, repeat step 5 except change the Top property to Bottom. Leave Bytes 3 to 8 blank.

7. Under Message Received By Module, set the ID field as "18EFFF93" and Mask as "1FFFFFFF". Leave Bytes as 8 and Cycle Test unchecked.

> **Note:** This Message ID is for illustrative purposes only and can be set to whatever works with your system.

8. Use the Bit Selector to pick Red LED, set the value as 1 and drop-down menu to Top. Click the bit 0 in Byte 1 of the receiving message. Increment the value to 2 and click bit 1 in Byte 1. Repeat up to value 8 for bit 7.

9. Change the property to Bottom and repeat step 8 for Byte 2.

10. Change the Bit Selector to Green LED and repeat step 8 for Byte 3. Then change the property to Bottom and fill in Byte 4.

11. Change the Bit Select to Blue LED and repeat step 8 for Byte 5. Then change property to Bottom and fill in Byte 6.

12. Next, use the Bit Selector to pick Enable All. Click bit 0 in Byte 7. A yellow box with two white ovals should be placed.

13. Return to the Bit Selector and change to Power. Make sure the top property is active. Click on bits 0 to 3 in Byte 8. Purple boxes should be placed with top ovals. For bits 4 to 7, use Power with Bottom property active.

14. Click the Write Design button. The module is now programmed.

15. OPTIONAL: Follow the Post-Test Setup instructions to test the newly edited PKUXX00.

3.37 Post-Test Setup (OPTIONAL)

For use with the 540SIM, 541CEI, 521CRED, 524CAM, 482CRM, and 516CANDI only. For PKUs, use the Configurator Interface.

1. Open CANcreate and load the "TestLab.ccs" file.

> **Note:** If the images fail to load, open the Image Library and click Import Image Pack. Locate the "testlab.cip" file and click Open. Click Refresh in the Image Library and then Reload.

2. Enable CAN Simulation and the CANcreate simulator.

> **Note:** Make sure CANconnect isn't open when testing with the CANcreate software.

3. Use the virtual display to select the appropriate module and open up the module's page.

4. From the simulator, you can observe the receiving and transmitting of data between the software and the CAN module.

Chapter 4 - Error Messages

4.1 Error Message Table

Error	Message
ERR_OK	"OK"
ERR_XMTFULL	"Send Buffer Full"
ERR_OVERRUN	"Overrun"
ERR_BUSLIGHT	"Bus Light"
ERR_BUSHEAVY	"Bus Heavy"
ERR_BUSOFF	"Bus Off"
ERR_QRCVEMPTY	"Receive Queue Empty"
ERR_QOVERRUN	"Receive Queue Overrun"
ERR_QXMTFULL	"Send Queue Full"
ERR_REGTEST	"Register Test Failed"
ERR_NOVXD	"No VxD Available"
ERR_HWINUSE	"Hardware in Use"
ERR_NETINUSE	”Net in Use"
ERR_ILLHW	"Invalid Hardware Handle (Device Not Connected)"
ERR_ILLNET	"Invalid Net Handle"
ERR_ILLCLIENT	"Invalid Client Handle"
ERR_RESOURCE	"Unable to Generate Resource (FIFO, Client, Timeout)"
ERR_PARMTYP	"Parameter Not Permitted"
ERR_PARMVAL	"Invalid Parameter Value"
ERR_NO_DLL	"No DLL Present"
ERR_TIMEOUT	"Time out communicating with 514UTC"
ERR_DATAERROR	"Data error communicating with 514UTC"
ERR_TXERR	"Transmission Error Detected"
ERR_MLOA	"Message Lost Arbitration"
ERR_ABTF	"Message Aborted Flag"

4.2 Error Information

Transmission error detected - A connection isn't working or set up correctly.

"DLL could not be loaded" when opening CANconnect - Typically means that you already have a copy of CANconnect open or the Gridconnect drivers have not been loaded.

Fail to Read/Write - Bad response message may occur upon request, check connections and retry Read/Write Design.