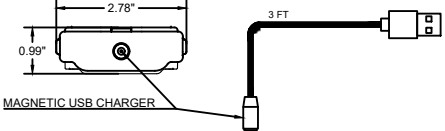
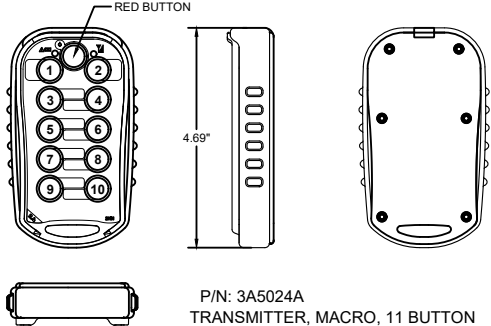


P/N 3A5024A  
SALES KIT, MACRO, PROGRAMMABLE, 11 BUTTON  
INCLUDING:  
1 EA 3A5024A TRANSMITTER  
1 EA 3A5023C RECEIVER



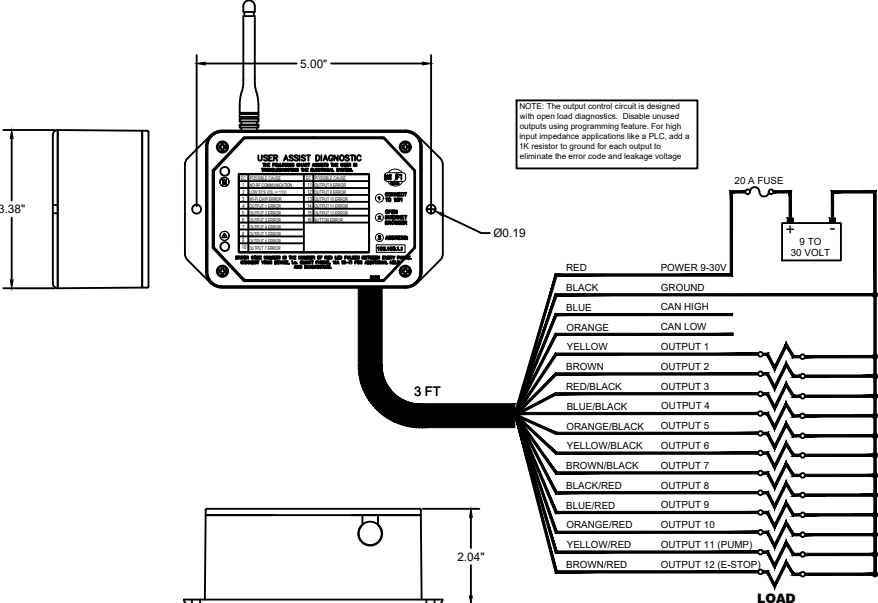
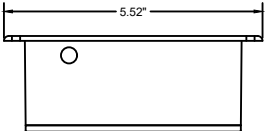
ONLY USE APPROVED CHARGERS  
MAGNETIC USB CHARGER (P/N: B20178A)

TRANSMITTER ERROR CODE CHART	
ERROR CODE	PROBABLE CAUSE
1	LOW BATTERY
CHECK CODE NUMBER, THE NUMBER OF "FLICK" CODES, BETWEEN EVERY PAGE.	



P/N: 3A5024A  
TRANSMITTER, MACRO, 11 BUTTON

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. Changes or modifications not expressly approved by Kar-Tech will void the user's authority to operate the equipment.



P/N: 3A5023C  
RECEIVER, 12 OUTPUT,CAN, PROGRAMMABLE

OPERATION

- To turn on the transmitter, press and hold the POWER button for at least 2 seconds and release
- To turn off the transmitter, press and hold the POWER button until the LEDs stop toggling
- The transmitter is designed with a power saving feature which turns the transmitter off after 15 minutes if no buttons are pressed, irrespective of receiver status.
- There are red and green LEDs both on the keypad of the transmitter and inside the receiver case. The green LED will blink 2 times per second when the transmitter and receiver are communicating. It will blink 1 time per second if there is no communication (i.e. - no power to the receiver)
- The red LED on the receiver will blink if there is a shorted or open output. Refer to the ERROR CODE CHART tables and count the number of blinks to determine the output with the fault
- The transmitter's red LED blinks 1 time per second if the battery is low and needs to be charged. The transmitter's red LED will be on during charging and when charging is complete the green LED will turn on and the red LED will turn off.
- The transmitter will take longer to charge if left on during charging

SYNCHRONIZING TRANSMITTER AND RECEIVER

- Each transmitter and receiver pair is synchronized together at the factory. If a new transmitter is needed, synchronizing is required. Use the following procedure:
1. Make sure both the transmitter and receiver are off.
  2. Press and hold the POWER button on the transmitter for more than 10 seconds. The red and green LED will start to blink.
  3. Apply power to the receiver
  4. Wait for a few seconds until only the green LED begins to blink on the transmitter
  5. Teach complete

SLEEP TIME

- All transmitters have the ability to change the sleep time from the default to user's preference. The transmitter is factory set to turn off (sleep) after 15 minutes. To change the time the transmitter waits before going to sleep, use the following procedure:
1. With the transmitter off, press and hold POWER and buttons 6, 7, and 8
  2. Release the buttons. At this point, both lights will blink once per second
  3. On the transmitter, press one of the following buttons to adjust the sleep time:
    - a. SW 1=15 minutes
    - b. SW 2=30 minutes
    - c. SW 3=1 hour
    - d. SW 4=2 hours
    - e. SW 5=sleep disabled
  4. Sleep time programming complete

CLONING TRANSMITTERS

**WARNING! - ONLY ONE TRANSMITTER CAN BE ON AT A TIME, THEY CANNOT BE USED SIMULTANEOUSLY - use with CAUTION!**

- Occasionally, it is desirable to have more than one transmitter work with a single receiver. This is accomplished by a process called cloning. Cloning allows an additional transmitter (B) to have the same ID code as the original transmitter (A). If this feature is desired, use the following procedure:
1. Make sure both transmitters and the receiver are off
  2. On Transmitter A, press and hold POWER button for 10 seconds then release. The transmitter's LEDs will start to blink together.
  3. On Transmitter B, press and hold buttons 5, 6, and POWER for 5 seconds then release. The transmitter's LEDs will start to blink.
  4. Wait for few seconds until only the green LED double blinks on both transmitters.
  5. Turn both the transmitters off
  6. Synchronize one of the transmitters to the receiver using SYNCHRONIZING TRANSMITTER AND RECEIVER instructions above

- If the cloning feature has been invoked and is no longer desired, the ID code of one of the transmitters needs to be changed. This will unclone the transmitters. If this is desired, use the following procedure:
1. Make sure the receiver and transmitter are OFF
  2. Press and hold buttons 2, 3, 7 and POWER simultaneously for 5 seconds then release. The transmitter's LEDs will start to toggle.
  3. Press any button again to select a new ID
  4. Uncloning complete
  5. Follow the SYNCHRONIZING TRANSMITTER AND RECEIVER procedure above to link the uncloned transmitter to a new receiver

SPECIFICATIONS:

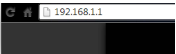
- Electrical:
- RF Transmit power (EIRP): 100 mW
  - RF Frequency: 2.4 GHz
  - Transmitter: Power: 3.7 LiPo Battery
  - Operation time with new battery: 30 to 40 hours continuous
  - Receiver: Power: 9 to 30 Volts DC
  - Outputs: 5A max each (20A system max)
- Environmental:
- Transmitter: -18°C to +55°C
  - Receiver: -40°C to +85°C
  - Encapsulated electronics inside receiver
- Default settings: 10 momentary outputs, no PUMP, and no E-STOP output/functionality

KAR-TECH				ORDER NUMBER	
Delafield, WI 53018				12	2
SALES KIT, MACRO 11 BTN 2.4 SYS				12	2
KAR-TECH				12	2
CSD DRAWING DO NOT REUSE UNLESS				12	2
FULL				12	2
12-11-24				12	2
3A-502-5-A-3A				12	2

**TROUBLESHOOTING USING ON BOARD GATE:**  
The ON-BOARD GATE creates a Wi-Fi access point which allows you to connect to any device with Wi-Fi and web browser such as smart phones, pads or personal computers. It supports Google Chrome, Internet Explorer, Firefox and IOS Safari and allows user to configure, diagnose and troubleshoot the system.

**ACCESSING THE CONTROL PANEL**

- 1. Turn on the power to the receiver.
- 2. Use your device and look for the available WiFi networks. A network under the name of “KARTECH3A502” should be available at this point. Connect to the network, password is 3A5023X1. If the Gate is not used for 5 minutes it will automatically turn off. Recycle power to the receiver to turn it back on.
- 3. Once the connection is established, open a web browser on your device. Kar-Tech recommends using the Chrome browser. The receiver's green LED will turn on solid when Wi-Fi is connected and pages are being accessed.
- 4. Enter the address http://192.168.1.1 in the address bar.



Address Bar

- 5. The following options are available from the main screen.



Main Screen

**DIAGNOSTICS**

Tap the Diagnostic button to see the diagnostic screens, which shows the present state of remote communications, and system I/O. When the round circle next to a label is dark, the corresponding ON/OFF input or output is sensed to be active or ON.



Diagnostics

**CALIBRATION**

To change the configuration of the unit, tap the Calibration icon.



Calibration

The password to gain access to the calibration screen is 1262.

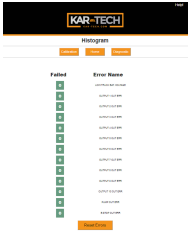
For each output 1-10 there are the following checkboxes/drop down boxes. Read below descriptions for desired configuration:

- a. Disable - checking this box will disable the output (no output and no error code). Otherwise, it will be enabled.
- b. Latched - checking this box will make the output latched instead of momentary
- c. Out of Range Off - checking this box will make the latched output turn off if the transmitter goes out of range. Otherwise, it will stay on.
- d. Pump - checking this box will turn on the PUMP (output 11) with the corresponding output
- e. Err. Code Disable - checking this box will disable the output error code
- f. Input for OFF - if the output is latched, select the button 1-10 that should turn the output off. Default is the same button that turns it on.
- g. Input for ON - if the output is latched, this indicates which button will turn on the output. These cannot be changed.
- h. E-STOP - if this box is checked, output 12 will be on as long as the transmitter is on. If the transmitter is turned off or POWER is pressed output 12 will go off along with all latched outputs. To reset, turn the transmitter back on or re-cycle power to the receiver and re-engage the outputs as before.

CAN packet Configuration - There are CAN messages available for to know the status of the buttons and outputs. Parameters of those CAN packets like PGN, Priority, Source address & Timing can be customized using the drop -down box available.

Tap the Save button to send the setting to memory  
Tap the Factory Settings button to return all outputs to standard values. Tap HOME to quit calibration and return to the main menu.

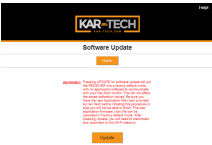
**HISTOGRAM**  
Tap the Histogram icon to see a set of screens that show which error codes are active and how many times the specific error code has been active.  
This feature can be used to troubleshoot machine wiring and other problems. Tapping the Reset button resets the error code counts. The password to reset error codes is 1262. Tap the Home button to return to the main menu.  
Note: the GATE is not a precision measurement instrument. There may be delays.



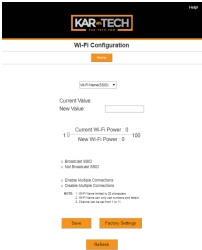
Histogram Page

**SOFTWARE UPDATE**

The password to gain access to the software update page is 1262.  
Use the Choose File button to select new software on your device with which to program the receiver. Kar-Tech will have provided software in the .kar format. Once the file is selected, press the SUBMIT button to upload the file.  
Note: This feature does not work on Apple mobile or tablet products.  
Note: Do not turn the receiver or the GATE off during the upload process.



Software Update Page



Wi-Fi Configuration Page

**Wi-Fi CONFIGURATION**

The password to gain access to the Wi-Fi configuration page is 1262.  
This page allows you to change the name (SSID) of the Wi-Fi network you are connecting to. Factory settings will rename the Wi-Fi to its original name.  
If Broadcast SSID option is selected, the Wi-Fi name (SSID) is public and it will be visible to any other Wi-Fi devices. Otherwise, the Wi-Fi name (SSID) is hidden and it would require manual connection to the network.  
If Enable Multiple Connections is selected, multiple connections up to 4 devices could be connected to the GATE. However, only one of the connected devices can use the GATE. If Single connection is enabled, only one device can be connected to the GATE.  
Also, there is a bar for adjusting the Wi-Fi power (default is 100%). This is useful to adjust if multiple Gates are being used in a close area.  
NOTE: A reconnect to the new Wi-Fi connection is needed after each change. It is advised to keep a note of the Wi-Fi name in case if Not Broadcast SSID option is selected. Forgetting the Wi-Fi name after selecting this option will require the GATE to be sent to KAR-TECH for RESET.

Note: the GATE is not a precision measurement instrument. There may be some delays.

CAN J-1939 PACKET 1 FROM RECEIVER TO CONTROLLER								
PGN	18FF007X							
PRIORITY	6							
TIMING	100 ms							
	DATA 0	DATA 1	DATA 2	DATA 3	DATA 4	DATA 5	DATA 6	DATA 7
BIT 1	0-1 TOGGLE	-	BUTTON 1	BUTTON 9	-	-	-	-
BIT 2	RF LINK	-	BUTTON 2	BUTTON 10	-	-	-	-
BIT 3	POWER BUTTON	-	BUTTON 3	-	-	-	-	-
BIT 4	-	-	BUTTON 4	-	-	-	-	-
BIT 5	-	-	BUTTON 5	-	-	-	-	-
BIT 6	-	-	BUTTON 6	-	-	-	-	-
BIT 7	-	-	BUTTON 7	-	-	-	-	-
BIT 8	-	-	BUTTON 8	-	-	-	-	-

CAN J-1939 PACKET 2 FROM RECEIVER TO CONTROLLER								
PGN	18FF0107X							
PRIORITY	6							
TIMING	100 ms							
	DATA 0	DATA 1	DATA 2	DATA 3	DATA 4	DATA 5	DATA 6	DATA 7
BIT 1	OUTPUT 1	OUTPUT 9	-	-	-	-	-	-
BIT 2	OUTPUT 2	OUTPUT 10	-	-	-	-	-	-
BIT 3	OUTPUT 3	OUTPUT 11	-	-	-	-	-	-
BIT 4	OUTPUT 4	OUTPUT 12	-	-	-	-	-	-
BIT 5	OUTPUT 5	-	-	-	-	-	-	-
BIT 6	OUTPUT 6	-	-	-	-	-	-	-
BIT 7	OUTPUT 7	-	-	-	-	-	-	-
BIT 8	OUTPUT 8	-	-	-	-	-	-	-

CAN J-1939 PACKET 3 FROM RECEIVER TO CONTROLLER								
PGN	18FF0207X							
PRIORITY	6							
TIMING	500ms							
	DATA 0	DATA 1	DATA 2	DATA 3	DATA 4	DATA 5	DATA 6	DATA 7
BIT 1	BATTERY VOLTAGE 0.05V/BIT		LOW SYS VOLTAGE	OUTPUT 7 ERROR	-	-	-	Wi-Fi CHIP ERROR
BIT 2			BUTTON ERROR	OUTPUT 8 ERROR	-	-	-	-
BIT 3			OUTPUT 1 ERROR	OUTPUT 9 ERROR	-	-	-	-
BIT 4			OUTPUT 2 ERROR	OUTPUT 10 ERROR	-	-	-	-
BIT 5			OUTPUT 3 ERROR	OUTPUT 11 ERROR	-	-	-	-
BIT 6			OUTPUT 4 ERROR	OUTPUT 12 ERROR	-	-	-	-
BIT 7			OUTPUT 5 ERROR	-	-	-	-	-
BIT 8			OUTPUT 6 ERROR	-	-	-	-	-

CAN J-1939 PACKET 4 FROM CONTROLLER TO RECEIVER								
PGN	18FF0006X							
PRIORITY	6							
TIMING	100ms							
	DATA 0	DATA 1	DATA 2	DATA 3	DATA 4	DATA 5	DATA 6	DATA 7
BIT 1	0	MESSAGE INDEX	CAN PGN (MSB: DATA3, LSB: DATA2)		PRIORITY	SOURCE ADDRESS	PERIOD (MSB: DATA7, LSB: DATA6)	
BIT 2								
BIT 3								
BIT 4								
BIT 5								
BIT 6								
BIT 7								
BIT 8								

CAN MESSAGING:

- The three packets to the left are sent from the receiver to the controller. Their indexes are as follows:
  - Packet 1 message index = 0
  - Packet 2 message index = 1
  - Packet 3 message index = 2
- The fourth packet can be sent to the receiver to change the settings of the three packets above
- Details of each packet are below

PACKET 1:

- This packet toggles Bit 1 under DATA 0, reports the link status between the transmitter & receiver, and the status of each of the transmitter's inputs
- Example:  
(Decimal) 2     0   5     0     0     0     0     0  
(HEX)    0x02   0   0x05   0x00   0x00   0x00   0x00   0  
This reports that the toggling bit is currently low, the transmitter & receiver are linked, and that switch 1 & 3 are pressed on the transmitter.

PACKET 2:

- This packet reports the status of each of the receiver's outputs (on or off).
- Example:  
(Decimal) 136    0     0     0     0     0   0   0  
(HEX)     0x88   0x00   0x00   0x00   0x00   0   0   0  
This reports that the following outputs are ON: output 4 and output 8.

PACKET 3:

- This packet reports the battery voltage applied to the receiver and any error codes if present. For battery voltage, byte 0 is the least significant byte and byte 1 is the most significant.
- Example:  
(Decimal) 22    1     0     128    0   0   0   0  
(HEX)     0x16   0x01   0x00   0x80   0   0   0   0  
This reports that the battery voltage is at 13.9V and that there is an error with output 14.

PACKET 4:

- This packet is used to configure Packets 1-3, if different settings are desired.
- PGN: the address number of the device to communicate with on the bus. Byte 2 is the least significant byte and byte 3 is the most significant.
  - Source Address: the address of the receiver.
  - Priority: the importance for the packet
  - Period: the time interval between packets sent on the bus. Byte 6 is the least significant byte and byte 7 is the most significant. Period should be entered in ms.

- Example:  
(Decimal) 0   0     239   255    3     6     50    0  
(HEX)     0   0x00   0xEF   0xFF   0x03   0x06   0x32   0x00  
This sets Packet 1's packet ID from 0x18FF0307 to 0x0CFFEF06 and changes the period to 50ms.
- To return all three packets to the default settings shown to the left, send the following:  
(Decimal) 0   3     0     0     0     0     0     0  
(HEX)     0   0x03   0x00   0x00   0x00   0x00   0x00   0x00

SPECIFICATIONS:

- Baud Rate = 250K
- Make sure your CAN bus has the proper terminating resistors installed. These are two 150 ohm resistors across CAN HIGH and CAN LOW, on at either end of the CAN bus.

FOR FCC, ICC, AND CE DECLARATIONS AND OTHER INFORMATION, SEE [HTTP://KAR-TECH.COM/CERTIFICATION](http://kar-tech.com/certification)

## **CALIBRATION BY TRANSMITTER:**

The user can determine output functionality (momentary or maintained action) and program the system to respond as desired with the transmitter. This is determined by the following procedure:

1. Turn the receiver off. Turn the transmitter on (press and hold POWER until both LEDs turn on, then release)
2. Press and hold 3, 4, and 7 and release. Red LED should be blinking on the transmitter
3. Turn the receiver on, make sure the green LED is blinking before proceeding to the next step. Be sure all outputs are connected to a load and that there are no error codes present (NOTE: outputs may cycle on and off while programming)
4. Are any outputs to be latched (push on/push off)? If yes continue. If no, skip to step 9 for outputs to be momentary.
5. Press button 1-10 corresponding to output 1-10 that is to be latched, until green LED goes on, then off
6. Press button that corresponds to OFF until green LED goes on, then off. This can be the same button that turns the output on. In this case, pressing the button alternates the output between ON and OFF.
7. If latched output should turn OFF for transmitter out of range condition press the button defined in step 6. If latched output should stay ON for transmitter out of range condition press any button other than button defined in step 6.
8. Repeat steps 5, 6, and 7 for any more outputs that are to be latched
9. Press POWER briefly. The receiver's red LED should blink, indicating that this step is accepted and complete. The red LED on the transmitter should also start to blink a different rate.
10. Are any outputs to be disabled (no output and no error code)? If yes, continue, if no, skip to step 12
11. One at a time, press and hold each button 1-10 corresponding to output 1-10 that is to be disabled, until the green LED goes on, then off
12. Press POWER briefly. The receiver's red LED should blink, indicating that this step is accepted and complete. The red LED on the transmitter should also start to blink at a different rate.
13. Is it desired to use the pump functionality (see description below)? If yes, continue, if no, skip to step 15
14. One at a time, press and hold each button 1-10 corresponding to output 1-10 that is to be associated with the pump output, until the green LED goes on, then off
15. Press POWER briefly. The receiver's red LED should blink, indicating that this step is accepted and complete. The red LED on the transmitter should also start to blink at a different rate.
16. Is it desired to use the e-stop functionality (see description below)? If yes, continue, if no, skip to step 18
17. To engage the e-stop functionality, press button 2 until the green LED goes on, then off
18. If no error code is desired for the E-STOP output press button 3 to disable otherwise go to step 19 to keep error code enabled
19. If the E-STOP output should turn OFF for transmitter out of range condition press button 4 otherwise go to step 20 to keep the output ON for transmitter out of range condition
20. If no error code is desired for the PUMP output press button 1 to disable otherwise go to step 21 to keep error code enabled
21. Press POWER briefly. The receiver's red LED should blink, indicating that this step is accepted and complete.
22. One at a time, press and hold each button 1-10 that the corresponding output error code needs to be disabled, until the green LED goes on, then off
23. Press POWER briefly. The receiver's red LED should blink, indicating that this step is accepted and complete.
24. Programming complete

### **NOTES:**

- Pump functionality: output 11 will turn on with any outputs that have been associated with it.
- E-stop functionality: output 12 will be on as long as the transmitter is on. If the transmitter is turned off or POWER is pressed output 12 will go off along with all latched outputs. To reset, turn the transmitter back on or re-cycle power to the receiver and re-engage the outputs as before.
- If the receiver does not blink the red LED after each sequence or the transmitter's red LED does not blink at a different rate as described above, the programming was not accepted for that section. Start from the beginning and go slowly. Keep a distance of 2-3 feet from the receiver when programming.
- The factory settings are: 10 momentary outputs, no pump output, and no e-stop output