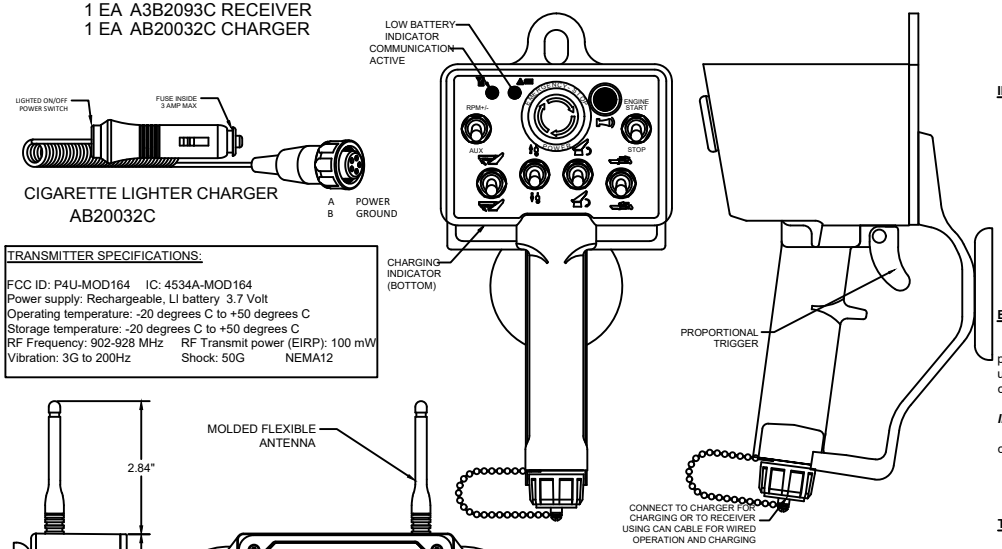
P/N A3B2901C SALES KIT, MOD 164, CRANE GUIDER W/ VC 194 RX ON-BOARD GATE

INCLUDING:

1 EA A3B2092A TRANSMITTER
1 EA A3B2093C RECEIVER
1 EA AB20032C CHARGER

TRANSMITTER: A3B2902A

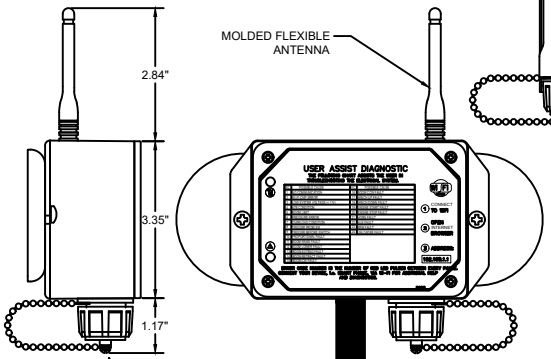


CIGARETTE LIGHTER CHARGER
AB20032C

A POWER
B GROUND

TRANSMITTER SPECIFICATIONS:

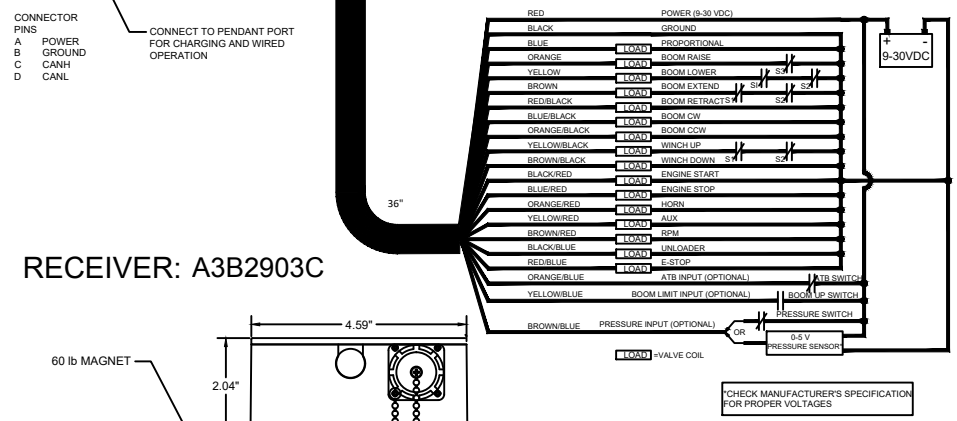
FCC ID: P4U-MOD164 IC: 4534A-MOD164
Power supply: Rechargeable, LI battery 3.7 Volt
Operating temperature: -20 degrees C to +50 degrees C
Storage temperature: -20 degrees C to +50 degrees C
RF Frequency: 902-928 MHz RF Transmit power (EIRP): 100 mW
Vibration: 3G to 200Hz Shock: 50G NEMA12



CRANES WITH ATB AND OVERLOAD SWITCH
S1 OVERLOAD PRESSURE SWITCH
S2 ANTI TWO BLOCK SWITCH

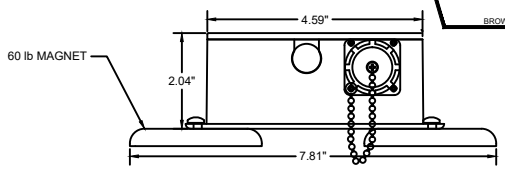
CRANES WITH OPTIONAL BOOM UP SWITCH TO PREVENT FALSE OVERLOAD
S1 BOOM UP LIMIT SWITCH

FACTORY SETTINGS
MIN: *300*
MAX: *1600*
FREQ: *200*



*CHECK MANUFACTURER'S SPECIFICATION FOR PROPER VOLTAGES

RECEIVER: A3B2903C



RECEIVER SPECIFICATIONS:

FCC ID: P4U-MOD164 IC: 4534A-MOD164
Power supply voltage: 9-30 VDC
Operating temperature: -40 degrees C to +85 degrees C
Storage temperature: -40 degrees C to +100 degrees C
Outputs: 5.0A max each, sourcing
Digital Inputs: supply voltage
Analog Inputs: 0-5 VDC
RF Frequency: 902-928 MHz
Vibration: 3G to 200Hz Shock:100G NEMA4X

OPERATION

- Power must be applied to the receiver module for the system to work.
- Releasing the E-STOP will turn on the transmitter. Pressing the E-STOP will turn off the transmitter. Pressing the E-STOP will also turn off all outputs as a safety feature. If the transmitter goes out of range for more than 2 seconds, all outputs will turn off as a safety feature.
- To operate a proportional output, toggle the switch of the desired function and pull the trigger to the level desired.
  ***Please note that if the trigger is pulled before the function is selected, the proportional output will not work as a safety feature. Release the trigger and begin again in the proper sequence.**
- To save battery life, the transmitter will turn off when it is idle (no functions are used) and receiver is off for period greater than 15 minutes. The user must press and release the E-STOP at this point to restore transmitter operation.
- **The transmitter will NOT go to sleep as long as the receiver has power applied to it.**

INDICATOR LED's

- The transmitter has two indicators, the red BATTERY indicator and the green TRANSMIT indicator. The green TRANSMIT indicator blinks rapidly (2x/second in RADIO mode, 5x/second in CAN mode) whenever there is communication between the transmitter and the receiver. It will double-blink when no functions are used.
- The red BATTERY indicator starts blinking once every second when the battery voltage is low and requires charging. Plug in the transmitter as soon as possible after seeing the low battery indicator. See BATTERY CHARGING below.
- The receiver module can identify problems with the system in the form of an error code. Check the red indicator or display window on the receiver to diagnose system problems. Then, refer to the ERROR CODE CHART in this manual for explanation of the error codes. The green LED indicator will blink on the receiver during active operation.
- If the ATB Input is enabled in calibration and the ATB input is driven low (no voltage), the red and green LEDs on the transmitter will blink alternately while using a switch.
- If the OVERLOAD Input is enabled in calibration and the input is driven low (no voltage), the red and green LEDs on the transmitter will blink together while using a switch.

BATTERY CHARGING

The transmitter is designed with a smart battery charger. The battery can be charged by connecting the CAN cable from the receiver module (powered on) to the port on the transmitter, or by plugging the AC wall charger or DC cigarette charger (minimum 2A @ 12.6VDC) into the port. Red and green LED indicators on the underside of the transmitter indicate the status of the charger: A red LED indicates that the battery is charging and a green LED indicates that the battery is fully charged.

IMPORTANT BATTERY INFORMATION:

When the battery is new, the run-time of the transmitter will be shorter until it has gone through the drain/charge cycle several times. After this point, the unit's current drain should allow at least 20 hours of run-time before a recharge is needed.

The temperature that the transmitter battery is exposed to affects performance and useful life. It is strongly recommended you keep within the following limits:

A. Charging: -0 degrees to +40 degrees C
B. Storing: -20 degrees to +50 degrees C

TRANSMITTER AND RECEIVER SYNCHRONIZATION

Each radio remote system is designed to operate with a unique radio ID code and RF channel sequence. Each receiver is programmed to respond *only* to the transmitter with the correct ID code/RF channel sequence for which it is set. This feature allows multiple systems to work in close proximity to one another without interference.

In the event that a transmitter becomes damaged and a new one is needed, the receiver can be reprogrammed to respond to the new transmitter. To teach the ID code to the receiver, use the following procedure. ***Please note that if this procedure is interrupted before it has completed, the system may have intermittent operation:**

TEACH BY CAN:

- Plug the CAN cable into the CAN port on both the receiver and transmitter and operate a function on the transmitter until the LEDs on the front panel go from steady to flashing for at least 5 seconds. The units will be synchronized at this point.

TEACH BY RADIO:

1. Turn the transmitter and receiver off
2. Press and hold the BOOM UP AND BOOM RETRACT switches
3. Release the E-STOP. Wait until the green LED begins blinking
4. Release the switches. Both LEDs should blink at this point
5. Apply power to the receiver. The green LED should go from steady to blinking on the transmitter
6. 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 E-STOP pressed, press and hold BOOM UP, WINCH UP, BOOM CCW and BOOM EXTEND.
2. Release E-STOP, keep holding the switches for >2 seconds. At this point, both lights will blink once per second. Release switches.
3. On the transmitter, press one of the following switches to adjust the sleep time:
   a. BOOM DOWN = 15 minutes
   b. WINCH DOWN = 30 minutes
   c. ROTATE CW = 60 minutes
   d. BOOM RETRACT = 2 hours
   e. HORN = sleep disabled
4. Sleep time programming complete

CLONING:

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, hold switches BOOM RAISE, BOOM RETRACT & release E-STOP and keep holding switches for couple of seconds and release. Green and red LEDs will blink together at this point
2. On Transmitter B, hold switches BOOM RETRACT, BOOM CCW, WINCH UP, release E-STOP and keep holding switches for couple of seconds and release. Green and red LEDs will blink together at this point
3. Wait for few seconds until the green LED starts to blink for Transmitter B, which indicates Cloning success.
4. Turn both the transmitters off
5. 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 transmitter is off.
2. Press and hold switches BOOM LOWER, WINCH DOWN, BOOM CW, BOOM RETRACT and release E-STOP and switches after couple of seconds. LEDs will start toggling.
3. Press any switch and release, GREEN LED should be blinking rapidly.
4. ID change Sequence complete.

CALIBRATING & TROUBLESHOOTING USING INTERNAL GATE:

The 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 KT3B290GUIDER should be available at this point. Connect to the network, password is "3B2903X1". If the Gate is not used for 5 minutes after power up it will automatically turn off. Recycle power to 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.
4. Enter the address http://192.168.1.1 in the address bar.

Calibration

Address Bar

Main Screen

CALIBRATION:

-To change the configuration of the unit, tap the Calibration icon. Calibration page can be used instead of the regular pendant calibration to change the outputs' behavior and enable limit conditions.

-The password to gain access to the calibration page is 1262.

-Tap the SAVE button to save 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.

-Tap the Help! button for more information about the controls.

Diagnostics

DIAGNOSTICS:

-Tap the Diagnostic button to see the diagnostic page, 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.

-It shows the info of the proportional output, transmitter battery level, receiver operating voltage and the value of the pressure in PSI when operated.

-It also shows the information of the current transmitter and receiver ID

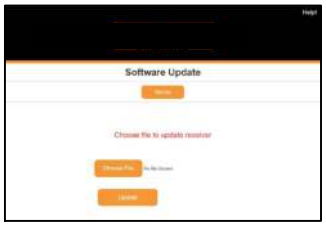
Histogram

HISTOGRAM:

-Tap the Histogram icon to see a page 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.



Receiver Software Update

SOFTWARE UPDATE: ***(Make sure .KAR file is available to start this process)***

-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 UPDATE button to upload the file.

Note: Do not turn the receiver off during the upload process.

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 Hide Network check box is checked, the Wi-Fi name (SSID) is hidden and it would require manual connection to the network. Otherwise the Wi-Fi name (SSID) is public and it will be visible to any other Wi-Fi devices.

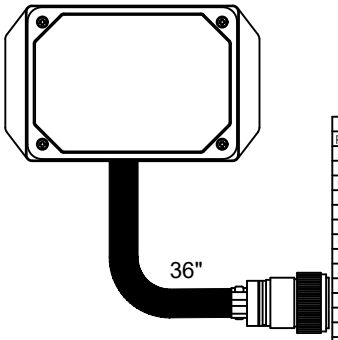
-If Enable Multiple Connections is selected, multiple connections up to 4 devices could be connected to the GATE. However, only one of the connected devices can use the GATE. If this is unchecked Single connection is enabled and only one device can be connected to the GATE.

-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. Then the Gate that the user wants to access can be made to have a higher power percentage.

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 "Not Broadcast SSID" option is selected. Forgetting the Wi-Fi name after selecting this option will require the Receiver to be sent to KAR-TECH for factory reprogramming.

NOTE TO INSTALLER:
RECEIVER INCLUDES A PROPORTIONAL VALVE DRIVER. REMOVE EXISTING DIN VALVE DRIVER FROM FLOW CONTROL VALVE. DISCONNECT BLACK AND GREEN WIRE FROM EXISTING VALVE DRIVER AND CONNECT DIRECTLY TO FLOW CONTROL VALVE COIL.
FOR CRANES WITHOUT THE DIN VALVE DRIVER, CONNECT PIN M FROM CRANE SIDE CIRCULAR CONNECTOR TO THE PROP VALVE AND CONNECT SECOND WIRE OF THE VALVE COIL TO GROUND.

SEE AUTO CRANE MANUAL FOR *ELECTRICAL SCHEMATIC HARD WIRE CRANE*



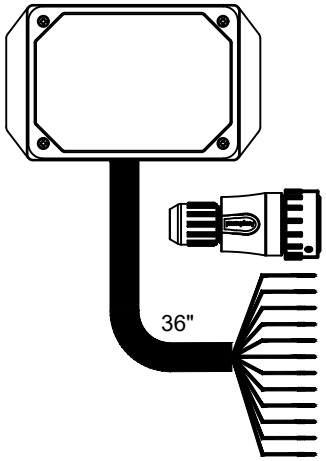
CA3106FA22-14 19 PIN CANON PLUG		
PIN	COLOR	DESCRIPTION
A	ORANGE	BOOM UP ON/OFF OUTPUT
B	YELLOW/BLACK	WINCH UP ON/OFF OUTPUT
C	BLUE/BLACK	BOOM CW ON/OFF OUTPUT
D	BROWN/RED	ENGINE FAST ON/OFF OUTPUT
E	ORANGE/BLACK	BOOM CCW ON/OFF OUTPUT
F	BROWN/BLACK	WINCH DOWN ON/OFF OUTPUT
G	YELLOW	BOOM DOWN ON/OFF OUTPUT
H	RED/BLACK	BOOM RETRACT ON/OFF OUTPUT
J	BROWN	BOOM EXTEND ON/OFF OUTPUT
K	BLACK/BLUE	UNLOADER OUTPUT
L	RED	POWER 9-30VDC
M	BLUE	PROPORTIONAL OUTPUT
N	BLACK	GROUND
P	YELLOW/RED	AUX ON/OFF OUTPUT
R	BLACK/RED	ENGINE START ON/OFF OUTPUT
S	BLUE/RED	ENGINE STOP ON/OFF OUTPUT
T	RED/BLUE	POWER TO BOSH RELAY OUTPUT/ E-STOP
U		NO CONNECT
V	ORANGE/RED	HORN ON/OFF OUTPUT

P/N: A3B290BC
RECEIVER AUTO CRANE WITH 19 PIN CONNECTOR

NOTE TO INSTALLER:
ALL WIRES ARE CRIMPED WITH DEUTSCH PINS. THEY ARE NOT INSTALLED IN THE CONNECTOR DUE TO THE VARIETY OF PIN OUT FOR EACH CARNE. INSTALL PINS IN THE CONNECTOR ACCORDING TO YOUR IMT CARNE WIRING.

RECEIVER INCLUDES A PROPORTIONAL VALVE DRIVER. TO CONNECT THE PROPORTIONAL OUTPUT TO THE PROP VALVE (FLOW CONTROL VALVE), REMOVE PIN B FROM 4 PIN PACKARD CONNECTOR J4 ON CRANE'S VALVE DRIVER AND PLACE IN PIN B OF THE TWO PIN PACKARD CONNECTOR J15 OF PROP VALVE COIL. FOR OLDER MODEL CRANES, CONNECT PIN R FROM CRANE SIDE CIRCULAR CONNECTOR TO THE PROP VALVE AND CONNECT SECOND WIRE OF THE VALVE TO GROUND.

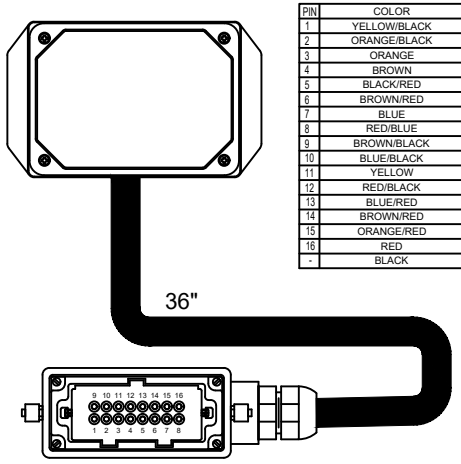
SEE IMT MANUAL FOR *SCHEMATIC, PROPORTIONAL REMOTE CONTROL.*



HD26-24-23PN 23 PIN DEUTSCH				
PIN**	PIN**		COLOR	DESCRIPTION
A			BLUE/BLACK	BOOM CW ON/OFF OUTPUT
B			BROWN	BOOM EXTEND ON/OFF OUTPUT
C			BROWN/BLACK	WINCH DOWN ON/OFF OUTPUT
D			YELLOW/BLACK	WINCH UP ON/OFF OUTPUT
F			RED/BLACK	BOOM RETRACT ON/OFF OUTPUT
G			BLACK/RED	ENGINE START ON/OFF OUTPUT
H			BLACK	GROUND
J			BROWN/RED	ENGINE SPEED/RPM OUTPUT
K			ORANGE/BLACK	BOOM CCW ON/OFF OUTPUT
L			RED	POWER 9-30VDC
M			BLUE/RED	ENGINE STOP ON/OFF OUTPUT
N			YELLOW	BOOM DOWN ON/OFF OUTPUT
P			ORANGE	BOOM UP ON/OFF OUTPUT
R			BLUE	PROPORTIONAL OUTPUT
S			BLACK/BLUE	CRANE UNLOADER OUTPUT
T			YELLOW/RED	COMPRESSOR/AUX OUTPUT
U			ORANGE/RED	HORN ON/OFF OUTPUT
V			RED/BLUE	E-STOP OUTPUT
		X	ORANGE/BLUE	ATB INPUT
		X	YELLOW/BLUE	BOOM LIMIT SWITCH INPUT
		X	BROWN/BLUE	BOOM PRESSURE INPUT

** BLANK PIN NUMBER COLUMN USED BY INSTALLER
*** SUGGESTED PINOUTS FOR IMT 3820 AND CRANES WITH TEHTHERED REMOTE (51713182)

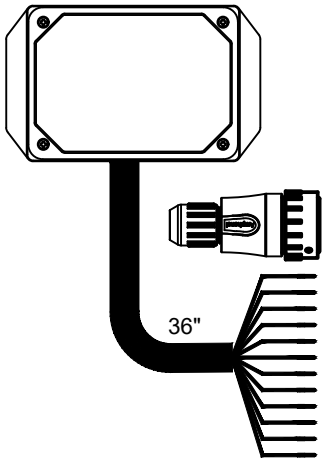
P/N: A3B290EC
RECEIVER IMT CRANE WITH 23 PIN DEUTSCH CONNECTOR



PIN	COLOR	DESCRIPTION
1	YELLOW/BLACK	WINCH UP ON/OFF OUTPUT
2	ORANGE/BLACK	ROTATION LEFT ON/OFF OUTPUT
3	ORANGE	ELEVATION UP ON/OFF OUTPUT
4	BROWN	EXTENSION OUT ON/OFF OUTPUT
5	BLACK/RED	ENGINE START ON/OFF OUTPUT
6	BROWN/RED	SPEED/RPM ON/OFF OUTPUT
7	BLUE	PROPORTIONAL OUTPUT
8	RED/BLUE	AUX POWER +12VDC/E-STOP OUTPUT
9	BROWN/BLACK	WINCH DOWN ON/OFF OUTPUT
10	BLUE/BLACK	ROTATION RIGHT ON/OFF OUTPUT
11	YELLOW	ELEVATION DOWN ON/OFF OUTPUT
12	RED/BLACK	EXTENSION IN ON/OFF OUTPUT
13	BLUE/RED	ENGINE STOP ON/OFF OUTPUT
14	BROWN/RED	AUX OUTPUT
15	ORANGE/RED	HORN ON/OFF OUTPUT
16	RED	POWER 9-30VDC
-	BLACK	GROUND (SHELL HOUSING)

P/N: A3B290HC
RECEIVER VENTURO CRANE WITH 16 PIN CONNECTOR

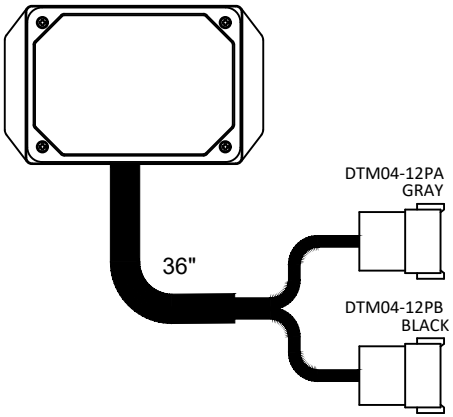
NOTE TO INSTALLER:
ALL WIRES ARE CRIMPED WITH DEUTSCH SOCKETS. THEY ARE NOT INSTALLED IN THE CONNECTOR DUE TO THE VARIETY OF PIN OUT FOR EACH CARNE. INSTALL PINS IN THE CONNECTOR ACCORDING TO YOUR MAINTAINER CARNE WIRING.



HD36-24-23SN 23 PIN DEUTSCH			
PIN**	PIN**	COLOR	DESCRIPTION
A		RED	POWER 9-30VDC
B		BLACK	GROUND
C		YELLOW	BOOM DOWN ON/OFF OUTPUT
D		ORANGE	BOOM UP ON/OFF OUTPUT
E		BROWN/RED	ENGINE SPEED/RPM OUTPUT
F		YELLOW/RED	COMPRESSOR/AUX OUTPUT
G		BROWN	BOOM EXTEND ON/OFF OUTPUT
H		RED/BLACK	BOOM RETRACT ON/OFF OUTPUT
J		BROWN/BLACK	WINCH DOWN ON/OFF OUTPUT
K		YELLOW/BLACK	WINCH UP ON/OFF OUTPUT
L		BLACK/BLUE	CRANE UNLOADER OUTPUT
M		ORANGE/BLACK	BOOM CCW ON/OFF OUTPUT
N		BLUE/BLACK	BOOM CW ON/OFF OUTPUT
O		BLACK	PROPORTIONAL VALVE GROUND
P		BLACK/RED	ENGINE START ON/OFF OUTPUT
Q			
R		BLUE/RED	ENGINE STOP ON/OFF OUTPUT
S		RED/BLUE	E-STOP OUTPUT
T			
U		BLUE	PROPORTIONAL OUTPUT
V		ORANGE/RED	HORN ON/OFF OUTPUT
W			
X			
	X	ORANGE/BLUE	ATB INPUT
	X	YELLOW/BLUE	BOOM LIMIT SWITCH INPUT
	X	BROWN/BLUE	BOOM PRESSURE INPUT

** BLANK PIN NUMBER COLUMN USED BY INSTALLER
*** SUGGESTED DETUSCH PINOUTS FOR MAINTAINER PROPORTIONAL CRANES WITH TETHERED REMOTE (P/N: 000385)

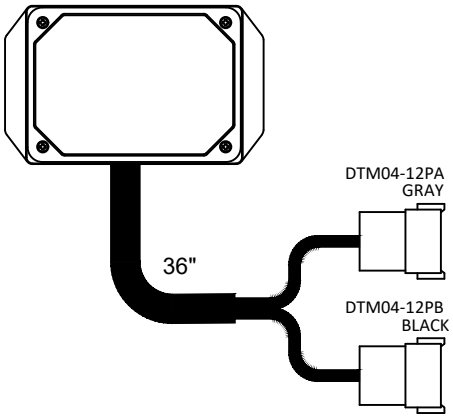
P/N: A3B290PC
RECEIVER MAINTAINER CRANE WITH 23 PIN DEUTSCH CONNECTOR



CONNECTOR, DTM04-12PA RECPTACLE, GRAY		
PIN	COLOR	DESCRIPTION
1		
2	BROWN/RED	ENGINE SPEED/RPM OUTPUT
3	BLUE/BLACK	ROTATION CW OUTPUT
4	YELLOW/BLACK	WINCH UP OUTPUT
5	BROWN	BOOM EXTEND OUTPUT
6	ORANGE	BOOM UP OUTPUT
7	YELLOW	BOOM DOWN OUTPUT
8	RED/BLACK	BOOM RETRACT OUTPUT
9	BROWN/BLACK	WINCH DOWN OUTPUT
10	ORANGE/BLACK	ROTATION CCW OUTPUT
11	YELLOW/RED	COMPRESSOR/AUX OUTPUT
12		

CONNECTOR, DTM04-12PB RECEPTACLE, BLACK		
PIN	COLOR	DESCRIPTION
1	BLUE/RED	ENGINE STOP OUTPUT
2		
3	RED/BLUE	MAIN CONTACT/ESTOP OUTPUT
4	BLUE	PROPORTIONAL OUTPUT
5		
6	RED	POWER (9-30V)
7	BLACK	GROUND
8		
9		
10		
11		
12	BLACK/RED	ENGINE START OUTPUT

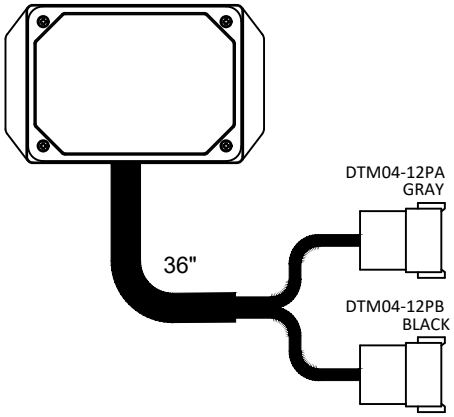
P/N: A3B2909C
RECEIVER STELLAR WITH TWO 12 PIN DEUTSCH CONNECTOR



CONNECTOR, DTM04-12PA RECPTACLE, GRAY		
PIN	COLOR	DESCRIPTION
1		
2	BLUE	PROPORTIONAL OUTPUT
3	BLACK	GROUND
4	BLACK	GROUND
5	BLACK/BLUE	UNLOADER
6	RED	POWER (9-30V)
7	BLUE/BLACK	ROTATION CW OUTPUT
8	ORANGE/BLACK	ROTATION CCW OUTPUT
9	ORANGE	BOOM UP OUTPUT
10	YELLOW	BOOM DOWN OUTPUT
11	BROWN	BOOM EXTEND OUTPUT
12	RED/BLACK	BOOM RETRACT OUTPUT

CONNECTOR, DTM04-12PB RECEPTACLE, BLACK		
PIN	COLOR	DESCRIPTION
1	YELLOW/BLACK	WINCH UP OUTPUT
2	BROWN/BLACK	WINCH DOWN OUTPUT
3	BLACK/RED	ENGINE START
4	BLUE/RED	ENGINE STOP
5	YELLOW/RED	AUX/BCN
6	BROWN/RED	RPM
7	ORANGE/RED	HORN
8		
9	BROWN/BLUE	PRESSURE SENSOR INPUT
10	ORANGE/BLUE	ATB SWITCH INPUT
11	YELLOW/BLUE	BOOM SWITCH INPUT
12		

P/N: A3B290VC
RECEIVER COBRA WITH TWO 12 PIN DEUTSCH CONNECTOR



CONNECTOR, DTM04-12PA RECPTACLE, GRAY		
PIN	COLOR	DESCRIPTION
1	YELLOW/RED	AUX OUTPUT
2		
3	BLACK	GROUND
4	BLUE	PROPORTIONAL OUTPUT
5		
6	RED	POWER (9-30V)
7	YELLOW	BOOM DOWN OUTPUT
8	RED/BLACK	BOOM RETRACT OUTPUT
9	BROWN/BLACK	WINCH DOWN OUTPUT
10	ORANGE/BLACK	ROTATION CCW OUTPUT
11	BLUE/RED	ENGINE STOP ON/OFF OUTPUT
12	BROWN/RED	RPM OUTPUT

CONNECTOR, DTM04-12PB RECEPTACLE, BLACK		
PIN	COLOR	DESCRIPTION
1	ORANGE	BOOM UP OUTPUT
2	BROWN	BOOM EXTEND ON/OFF OUTPUT
3	RED/BLUE	E-STOP OUTPUT
4	YELLOW/BLACK	WINCH UP ON/OFF OUTPUT
5	BLACK/RED	ENGINE START ON/OFF OUTPUT
6	BLUE/BLACK	ROTATION CW ON/OFF OUTPUT
7		
8		
9		
10	ORANGE/BLUE	ATB SWITCH INPUT
11	BROWN/BLUE	PRESSURE INPUT 0-5VDC
12		

P/N: A3B290XA
RECEIVER STELLAR 14528 WITH TWO 12 PIN DEUTSCH CONNECTOR

CALIBRATION BY PENDANT

This section will explain the process of configuring and calibrating the remote to work with many different types of cranes like stick boom or articulated types with or without engine/auxiliary functions. Some of the outputs can be configured from momentary to latching , i.e. changing momentary Horn output to latching Light output. The remote can be also configured for cranes with Anti Two Block (ATB), Over Load (OVL) and a Boom Up limit switch as an input to the receiver. The ATB and OVL logic stops the Winch Up, Boom Down and Extend when power is removed from those inputs. The Boom Up switch input is designed for cranes with a Boom Up limit switch to stop the boom up when power is applied to the input to prevent false overload.

The proportional flow-control output can be used in current-regulated or non-current-regulated (PWM voltage) mode. Current regulation is used when the output is connected directly to valve coils and non-current-regulated is used when the output is connected to the existing crane valve driver. Step 6 sets the current-regulated or non-current-regulated mode. Steps 7 and 8 will set the minimum and maximum values for the proportional valve as the trigger is pulled during crane operation to change the speed of operation. The valve frequency is set at step 8, with three of the most common values available. If additional crane functions are needed, i.e.: Winch 2 or Upper Boom, follow Step 11 to set the proportional output and dump valve output to work with the upper switches on the remote.

IMPORTANT NOTES:

1. Every part of this sequence must be performed for the system to be programmed successfully. *If at any time during the process you make a mistake or change your mind, you can start over by turning the transmitter and receiver off and beginning again at the start of the sequence*
2. To revert to the original factory settings, press and release BOOM EXTEND 16 times after entering calibration mode in step 4 or until the red light stops and the green light starts blinking on the transmitter.

Use the following procedure:

1. Make sure the transmitter is off
2. On the transmitter, press and hold BOOM UP, WINCH DOWN, and ROTATE CW
3. Release the E-STOP and wait until the green LED starts blinking, then release the switches - the red LED will blink rapidly at this point on the transmitter, indicating that you've entered the programming mode
4. The red LED on the receiver will blink rapidly indicating it is ready
5. Press and release the BOOM EXTEND switch once to begin programming. After each press and release of BOOM EXTEND to enter a choice, the red LED will change its blinking speed to confirm (first fast, then slow, etc.)

6. Set the PWM output mode:
   a. To choose current-regulated mode for the proportional output, press and release BOOM EXTEND
   b. To choose non-current-regulated mode for the proportional output, press and hold WINCH DOWN, then press and release BOOM EXTEND, then release WINCH DOWN
7. Set the MINIMUM speed required for the crane by toggling a function switch to activate the on/off valve or measure voltage/current at the proportional valve coil:
   a. Hold WINCH DOWN and pull trigger to desired level
   b. Press and release BOOM EXTEND to save the MINIMUM value
   c. Release the trigger
8. Set the MAXIMUM speed required for the crane by toggling a function switch to activate the On/Off valve or measure voltage/current at the proportional valve coil:
   a. Hold WINCH DOWN and pull trigger to desired level
   b. Press and release BOOM EXTEND to save MAXIMUM value
   c. Release the trigger

9. Set the valve dither frequency:
   a. Press and release BOOM UP the following number of times to get the required frequency desired:
      - Press and release once for 60Hz. The green LED will blink once and pause
      - Press and release twice for 100Hz. The green LED will blink twice and pause
      - Press and release 3 times for 200Hz. The green LED will blink 3 times and pause

   Toggling once more will bring you back to the beginning of the frequency selection
   b. Press and release BOOM EXTEND to save

10. Assign latching functions if needed:
    a. RPM
       - Latching action (DEFAULT) - hold RPM and press and release BOOM EXTEND, release RPM
       - Momentary action - Press and release BOOM EXTEND
    b. AUX
       - Latching action (DEFAULT) - hold AUX and press and release BOOM EXTEND , release AUX
       - Momentary action - Press and release BOOM EXTEND
    c. ENGINE START
       - Latching action - hold ENGINE START and press and release BOOM EXTEND, release
       - Momentary action (DEFAULT) - press and release BOOM EXTEND
    d. ENGINE STOP
       - Latching action - hold ENGINE STOP and press and release BOOM EXTEND, release
       - Momentary action (DEFAULT) - Press and release BOOM EXTEND
    e. HORN
       - Latching action - hold HORN and press and release BOOM EXTEND, release HORN
       - Momentary action (DEFAULT) - press and release BOOM EXTEND

11. Re-assign outputs as additional crane functions (to work with proportional output) if needed:
    a. RPM/AUX
       - Crane function - hold RPM and press and release BOOM EXTEND, release RPM
       - Normal (RPM/AUX) - Press and release BOOM EXTEND
    b. ENGINE START/STOP
       - Crane function - hold START and press and release BOOM EXTEND, release START
       - Normal (START/STOP) - press and release BOOM EXTEND

12. To enable optional Anti Two Block (ATB) input:
    a. Hold WINCH UP and press and release BOOM EXTEND, release WINCH UP
    b. Disable ATB input - press and release BOOM EXTEND

13. To enable optional Over Load (OVL) input:
    a. Hold BOOM DOWN and press and release BOOM EXTEND, release BOOM DOWN
    b. Disable OVL input - press and release BOOM EXTEND

14. To enable optional BOOM LIMIT switch input:
    a. Hold BOOM UP and press and release BOOM EXTEND, release BOOM UP
    b. Disable BOOM LIMIT input - press and release BOOM EXTEND

15. To enable FREE TRIGGER LOGIC:
    a. Hold HORN and press and release BOOM EXTEND, release HORN
    b. Disable FREE TRIGGER LOGIC (default) - press and release BOOM EXTEND

16. Press and release BOOM EXTEND to save settings
17. Turn receiver power off and on again
18. Programming complete