MCS-7147 Maintenance Interface Panel

USER'S MANUAL

(version 2.0)

www.db-integrations.com

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MCS Maintenance Panel Overview:

The MCS-7147 Maintenance Interface Panel is a self-contained interface assembly for the *Honeywell* MCS-7147 SATCOM system. It breaks out all interfaces of the system for ease of testing or running on a bench. There are three built-in ARINC 429 channels for navigation injection and BITE monitoring.

Equipment Part Numbers:

Description	Part Number
MCS Maintenance Panel	DB10-300-01

Physical Specifications:

MCS Maintenance Interface Cabinet Physical Specifications	
Part Number:	DB10-300-01
Dimensions:	19” wide x 5.30” tall x 9.50” deep
Power:	120-240VAC (50-60 HZ)

Databoss-II:

The MCS Maintenance Panel incorporates three ARINC 429 channels which run off of DB Integrations' proprietary Databoss-II software. The indications of these transceivers are carried out to the touchscreen which can help determine the status of the unit without the need to connect to a PC and view the Graphical User Interface (GUI).

Panel Connector Pinouts:

J1, 57 pin female CPC
TE Connectivity, P/N: 1-796329-1

Mates With:
TE Connectivity, P/N: 206437-1
Pin QPL P/N: M39029/64-369

Backshell:
TE Connectivity, P/N: 182930-1

Pin 1	SDU TP13K strap	Pin 27	Non-MCS fail discrete
Pin 2	SDU TP13J strap	Pin 28	SDU TP12G strap
Pin 3	SDU TP13H strap	Pin 29	SDU TP11C strap
Pin 4	SDU TP13F strap	Pin 30	SDU TP11D strap
Pin 5	SDU TP12B strap	Pin 31	SDU TP11F strap
Pin 6	SDU TP13A strap	Pin 32	SDU TP11E strap
Pin 7	SDU TP13B strap	Pin 33	SDU TP10G strap
Pin 8	SDU TP13C strap	Pin 34	Spare discrete
Pin 9	SDU TP13G strap	Pin 35	Channel 2 in-use discrete
Pin 10	SDU address common	Pin 36	SDU TP11A strap
Pin 11	SDU TP12D strap	Pin 37	SDU TP10K strap
Pin 12	SDU TP12C strap	Pin 38	SDU TP10J strap
Pin 13	SDU TP12A strap	Pin 39	SDU TP10E strap
Pin 14	SDU TP12J strap	Pin 40	SDU TP10H strap
Pin 15	SDU TP12H strap	Pin 41	SDU TP10F strap
Pin 16	SDU TP12K strap	Pin 42	HPA power (115VAC)
Pin 17	SDU TP11K strap	Pin 43	Logged off discrete
Pin 18	HGA fail discrete	Pin 44	SDU TP13E strap
Pin 19	SDU TP12E strap	Pin 45	SDU TP10A strap
Pin 20	SDU TP13D strap	Pin 46	SDU TP10B strap
Pin 21	SDU TP12F strap	Pin 47	SDU TP10C strap
Pin 22	SDU TP11G strap	Pin 48	SDU TP10D strap
Pin 23	SDU TP11H strap	Pin 49	HPA power (115VAC)
Pin 24	SDU TP11J strap	Pin 50	Cabin voice available discrete
Pin 25	SDU TP11B strap	Pin 51	Cockpit voice available discrete
Pin 26	Channel 1 in-use discrete	Pin 52	Satlink available discrete

Pin 53	MCS fail discrete
Pin 54	HPA power (28VDC)
Pin 55	HPA power (28VDC)

Pin 56	HPA power (28VDC)
Pin 57	HPA power (28VDC)

J2, 63 pin male CPC
TE Connectivity, P/N: 206455-2

Mates With:
TE Connectivity, P/N: 205842-1
Pin QPL P/N: M39029/63-368

Backshell:
TE Connectivity, P/N: 182930-1

Pin 1	POTS 2, pin 2	Pin 28	Ethernet 1, pin 1
Pin 2	POTS 1, pin 3	Pin 29	Ethernet 1, pin 2
Pin 3	POTS 1, pin 2	Pin 30	Phone 1, ringer A
Pin 4	ARINC 429, TX channel 2B	Pin 31	ISDN 2, pin 3
Pin 5	Phone 2, audio output HI	Pin 32	ISDN 2, pin 6
Pin 6	Phone 2, audio input HI	Pin 33	ISDN 2, pin 5
Pin 7	Phone 2, ringer A	Pin 34	ISDN 2, pin 4
Pin 8	Phone 1, audio output LO	Pin 35	ARINC 429, HPA BITE RX A
Pin 9	Phone 1, audio input LO	Pin 36	ARINC 429, ACU BITE RX A
Pin 10	POTS 2, pin 3	Pin 37	Ethernet 1, pin 3
Pin 11	ARINC 429, TX channel 2A	Pin 38	Ethernet 1, pin 6
Pin 12	Phone 2, audio output LO	Pin 39	SDU CMT TX
Pin 13	Phone 2, audio input LO	Pin 40	ISDN 1, pin 5
Pin 14	Phone 2, ringer B	Pin 41	ISDN 1, pin 6
Pin 15	Phone 2, hookswitch	Pin 42	HSD console RX
Pin 16	Phone 1, audio output HI	Pin 43	ARINC 429, HPA BITE RX B
Pin 17	ARINC 429, MCDU RX A (future)	Pin 44	ARINC 429, ACU BITE RX B
Pin 18	Ethernet 2, pin 3	Pin 45	Cept-E1, pin 1
Pin 19	Ethernet 2, pin 1	Pin 46	Cept-E1, pin 3
Pin 20	Phone 1, audio input HI	Pin 47	SDU CMT RX
Pin 21	Phone 1, ringer B	Pin 48	ISDN 1, pin 4
Pin 22	Phone 1, hookswitch	Pin 49	ISDN 1, pin 3
Pin 23	ARINC 429, MCDU TX B (future)	Pin 50	HSD console TX
Pin 24	ARINC 429, MCDU TX A (future)	Pin 51	HSD console GND
Pin 25	ARINC 429, MCDU RX B (future)	Pin 52	SDU power (115VAC)
Pin 26	Ethernet 2, pin 6	Pin 53	Cept-E1, pin 2
Pin 27	Ethernet 2, pin 2	Pin 54	Cept-E1, pin 6

Pin 55	SDU CMT/DLT GND
Pin 56	SDU DLT RX
Pin 57	SDU DLT TX
Pin 58	Ground
Pin 59	SDU power (115VAC)

Pin 60	SDU power (28VDC)
Pin 61	SDU power (28VDC)
Pin 62	SDU power (28VDC)
Pin 63	SDU power (28VDC)

J3, 57 pin female CPC
TE Connectivity, P/N: 1-796329-1

Mates With:
TE Connectivity, P/N: 206437-1
Pin QPL P/N: M39029/64-369

Backshell:
TE Connectivity, P/N: 182930-1

Pin 1	ARINC 429, TX channel 1B	Pin 28	SDU AES ID, bit 21
Pin 2	ARINC 429, TX channel 1A	Pin 29	SDU AES ID, bit 18
Pin 3	HSD discrete out 1	Pin 30	SDU AES ID, bit 3
Pin 4	HSD WOW 2 strap	Pin 31	SDU AES ID, bit 10
Pin 5	HSD forward ID, bit 13	Pin 32	HSD config 3 discrete
Pin 6	HSD forward ID, bit 12	Pin 33	HSD config 2 discrete
Pin 7	HSD forward ID, bit 11	Pin 34	SDU AES ID, bit 16
Pin 8	HSD discrete out 2	Pin 35	SDU AES ID, bit 15
Pin 9	HSD WOW 1 strap	Pin 36	SDU AES ID, bit 14
Pin 10	HSD WOW select discrete	Pin 37	SDU AES ID, bit 12
Pin 11	Ground	Pin 38	HSD forward ID, bit 21
Pin 12	Ground	Pin 39	SDU AES ID, bit 8
Pin 13	Ground	Pin 40	HSD config 1 discrete
Pin 14	HSD forward ID, bit 14	Pin 41	HSD forward ID, bit 20
Pin 15	HSD reset common	Pin 42	SDU AES ID, bit 13
Pin 16	HSD SDI 2 discrete	Pin 43	SDU AES ID, bit 11
Pin 17	HSD SDI common	Pin 44	SDU AES ID, bit 2
Pin 18	SDU AES ID, bit 22	Pin 45	SDU AES ID, bit 5
Pin 19	SDU AES ID, bit 23	Pin 46	HSD forward ID, bit 22
Pin 20	SDU AES ID, bit 24	Pin 47	HSD forward ID, bit 17
Pin 21	HSD forward ID, bit 15	Pin 48	HSD forward ID, bit 18
Pin 22	SDU AES ID, bit 17	Pin 49	SDU AES ID, bit 1
Pin 23	HSD reset	Pin 50	SDU AES ID, bit 4
Pin 24	HSD SDI 1 discrete	Pin 51	SDU AES ID, bit 6
Pin 25	HSD config 4 discrete	Pin 52	HSD forward ID, bit 24
Pin 26	SDU AES ID, bit 19	Pin 53	HSD forward ID, bit 16
Pin 27	SDU AES ID, bit 20	Pin 54	HSD forward ID, bit 19

Pin 55	SDU AES ID, bit 7
Pin 56	HSD forward ID, bit 23

Pin 57	SDU AES ID, bit 9

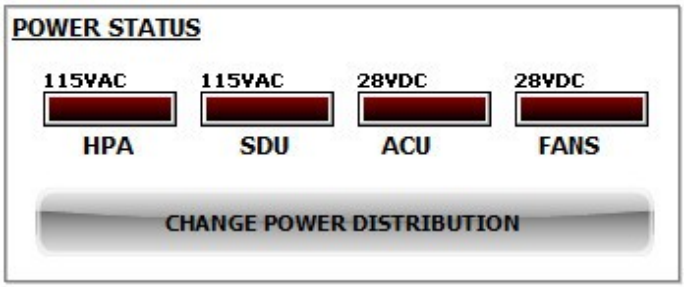
J4, 28 pin female CPC TE Connectivity, P/N: 1-207216-1 Mates With: TE Connectivity, P/N: 206039-1 Pin QPL P/N: M39029/64-369 Backshell: TE Connectivity, P/N: 182661-1			
Pin 1	Fan power (28VDC)	Pin 15	HSD forward ID common
Pin 2	Fan power (28VDC)	Pin 16	Ground
Pin 3	Fan power (28VDC)	Pin 17	Ground
Pin 4	HSD forward ID, bit 5	Pin 18	HSD forward ID, bit 6
Pin 5	Ground	Pin 19	HSD forward ID, bit 9
Pin 6	Ground	Pin 20	ACU power (28VDC)
Pin 7	Ground	Pin 21	Ground
Pin 8	ACU power (28VDC)	Pin 22	Ground
Pin 9	HSD forward ID, bit 4	Pin 23	HSD forward ID, bit 2
Pin 10	Ground	Pin 24	HSD forward ID, bit 8
Pin 11	Ground	Pin 25	HSD forward ID, bit 10
Pin 12	Ground	Pin 26	HSD forward ID, bit 3
Pin 13	Ground	Pin 27	HSD forward ID, bit 1
Pin 14	ACU power (28VDC)	Pin 28	HSD forward ID, bit 7

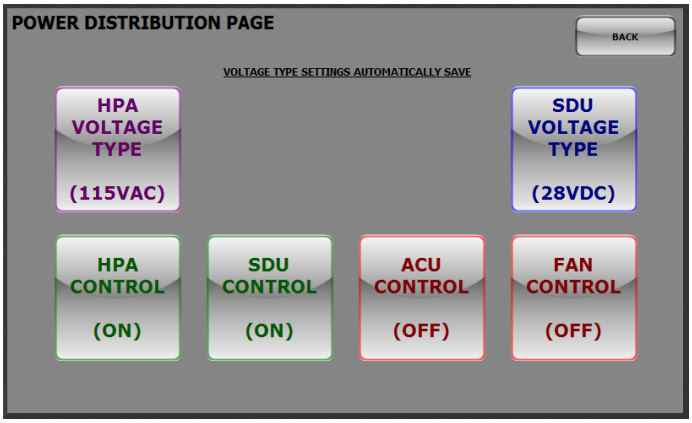
Powering On/Off The Panel:

Plug the Maintenance Interface Panel into the proper electrical receptacle. Initiate power by pressing the "ON/OFF" button located at the top, right hand side of the panel face. Press it a second time to turn the unit off.

Powering On/Off The LRUs:

The home screen shows the status of the power being distributed to the different LRUs of the SATCOM system. Press the CHANGE POWER DISTRIBUTION button to access the power distribution page.





The upper buttons will toggle the power output to the LRUs between 115VAC and 28VDC. Pressing these buttons automatically saves the option and sends this power type on the next power cycle.

The lower buttons will toggle the power to the individual LRUs. The fans will automatically power up when either LRU is powered.

LRU power is NOT provided by the cabinet. 115VAC and 28VDC needs to be provided by external power supplies. These connections are provided on the back of the cabinet.

28VDC 1 - is dedicated to powering the HPA, only.

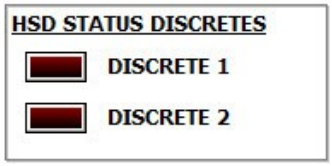
28VDC 2 - is used to power the SDU and ACU.

115VAC - is used to power both the SDU and HPA and needs to be 400Hz.

120-240VAC - is used to power the interface panel.

SATCOM Output Discretes:

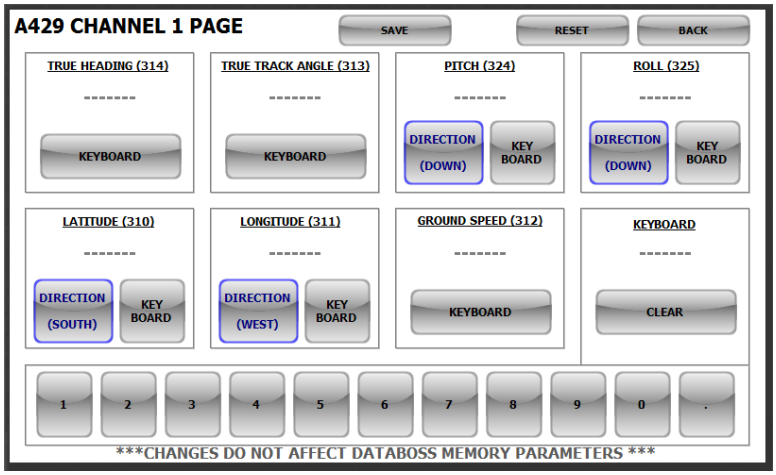
The MCS Maintenance Panel has many lights that represent the discrete outputs from the SDU and HPA. Each light corresponds to its respective output and can either be red or green. A red indication means that the output is high and green indicates that it is grounded.



Navigational Manipulation:

The MCS Maintenance Panel has the ability to change the ARINC 429 navigational words by inputs to the touchscreen. The starting point for these words comes from the internal memory of the unit and can be manipulated from there. 7 of the IRS transmitted words can be changed from the touchscreen by pressing VIEW under ARINC 429 CHANNEL 1 on the home screen.

The ARINC 429 channel one manipulation screen will display a snapshot of the IRS words that are currently set. These values are not necessarily being transmitted, but represent the parameters that are either set in memory or have been changed from the touchscreen.



To change a value for any given ARINC 429 word, simply type the value at the keyboard area. When complete, press any one of the KEYBOARD buttons to transfer the value to that specific label. The unit will automatically calculate the ARINC 429 word for the entered value and transmit accordingly. These changes do NOT affect the values that are stored in the unit's memory. Therefore, rebooting the unit will bring these values back to their stored defaults.

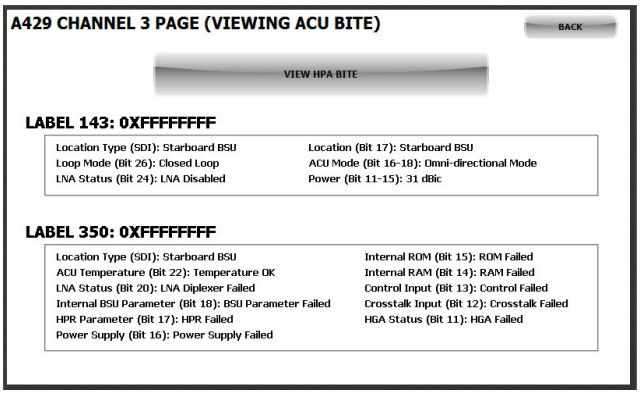
Pressing the SAVE button will save the entered values of the current page in the unit's memory.

Pressing the RESET button will bring all values that were changed in the touchscreen back to their internal memory values.

Channel 2 data can only be changed through a PC and the Databoss graphical user interface software. See the section labeled Databoss Graphical User Interface Software for more information. If desired, channel 2 can be tied to the output of channel 1 for duplicate IRS data by pressing the BUS TIE (OFF) button. This setting will automatically save.

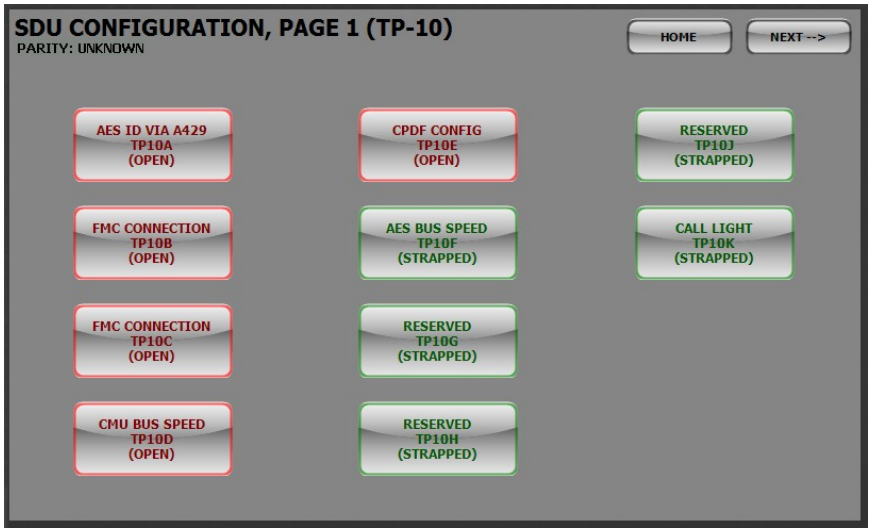
SATCOM BITE Decoding:

The MCS Maintenance Panel has the ability to read and decode ARINC 429 BITE information from the ACU and HPA. Pressing VIEW under ARINC 429 CHANNEL 3 on the home screen will display the ARINC 429 channel 3 page. Pressing the long button will toggle this screen between ACU and HPA BITE information.



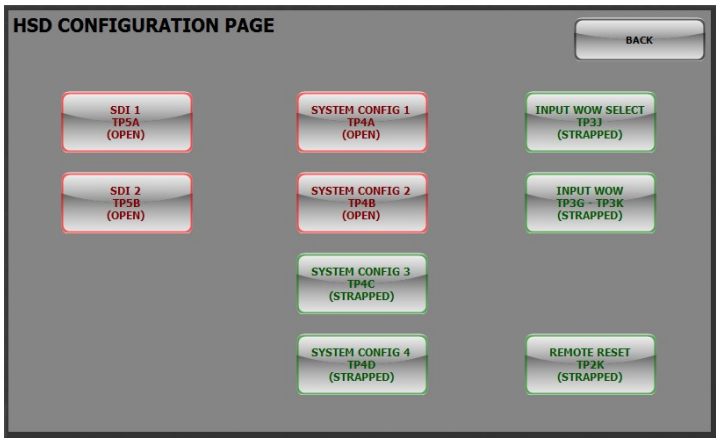
SDU Configuration Straps:

The MCS Maintenance Panel has the ability to toggle all SDU configuration straps on the fly for ease of system setup. Each strap change will automatically save to the unit's memory; therefore, will power up each time with the configuration set. After each strap change, the unit will also calculate for the proper parity strap setting. To reach the SDU configuration strap pages, press the SDU CONFIGURATION button.



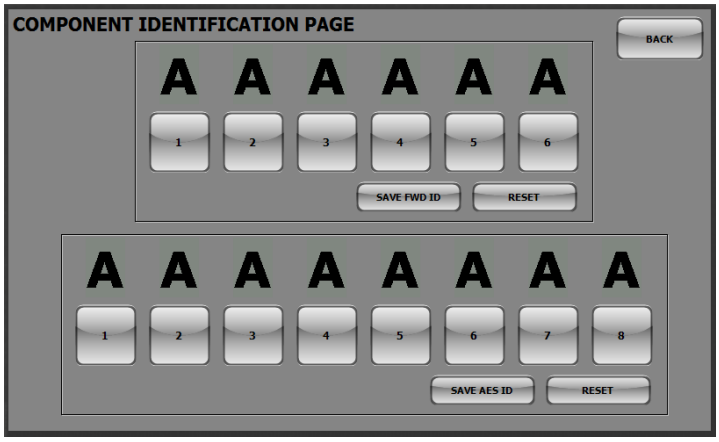
HSD Configuration Straps:

The MCS Maintenance Panel has the ability to toggle all HSD configuration straps on the fly for ease of system setup. Each strap change will automatically save to the unit's memory; therefore, will power up each time with the configuration set. To reach the HSD configuration strap pages, press the HSD CONFIGURATION button.



AES and forward ID Straps:

The MCS Maintenance Panel has the ability to toggle all SDU AES ID and HSD forward ID straps on the fly for ease of system setup. Press the CHANGE ID'S button to access the component identification page. Simply press each byte button until the desired byte is achieved.



Pressing either SAVE FWD ID or SAVE AES ID will save the entered values of the current array in the unit's memory respectively.

Pressing the RESET buttons will bring all values that were changed in the touchscreen back to their internal memory values respectively.

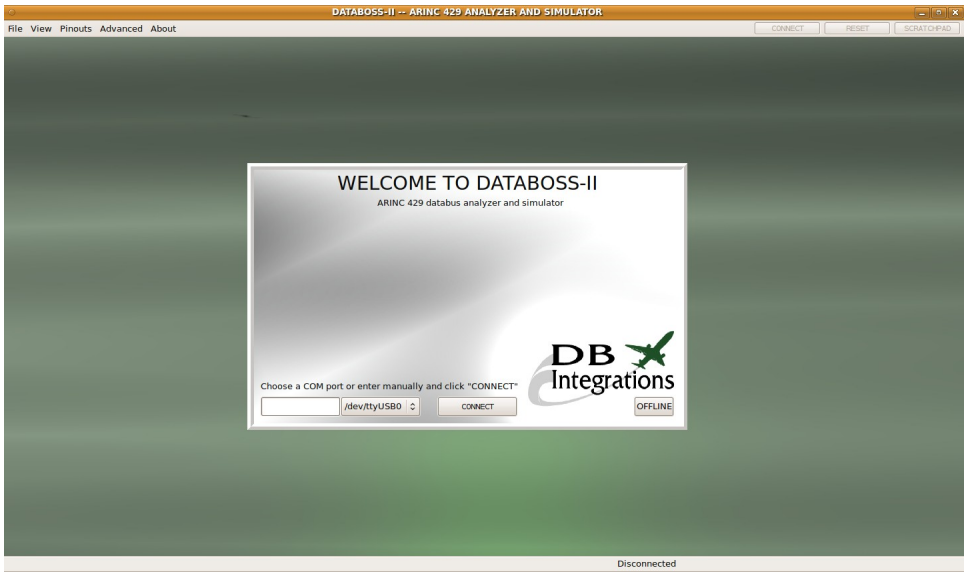
Databoss Graphical User Interface Software:

The MCS Maintenance Panel incorporates three ARINC 429 channels which run off of DB Integrations' proprietary Databoss-II software. Install the Databoss-II GUI program onto a laptop or PC. This program is provided free of charge and can be downloaded from our website.

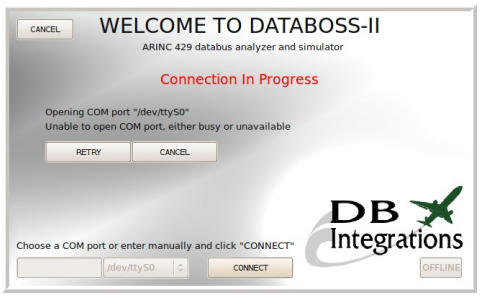
The default answers will most likely suffice during the installation process, but can be manipulated for specific needs. Once installed, the PC is ready to communicate with the unit.

Databoss-II PC Communication:

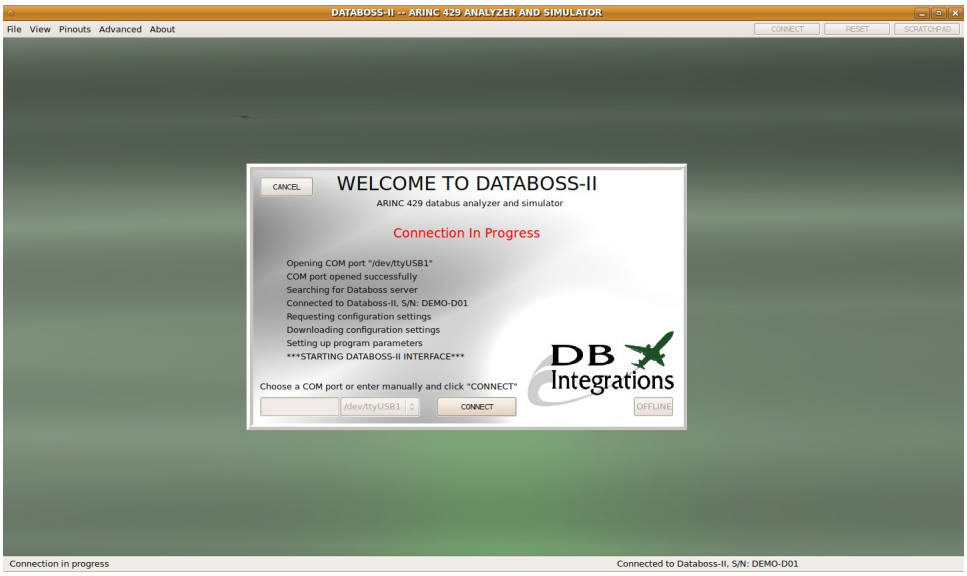
The Databoss-II communicates with a PC via an RS232 serial interface. A USB-Serial adapter will be required, even if the PC is equipped with a built in DB9 serial port. The baudrate needed to operate the software is not supported by the built in serial interface of most PCs. This adapter is not included with the purchase. Determine which COM port the PC is using and select it from the drop down list. A custom port option is also available. Once, the proper port has been selected, click the CONNECT button.



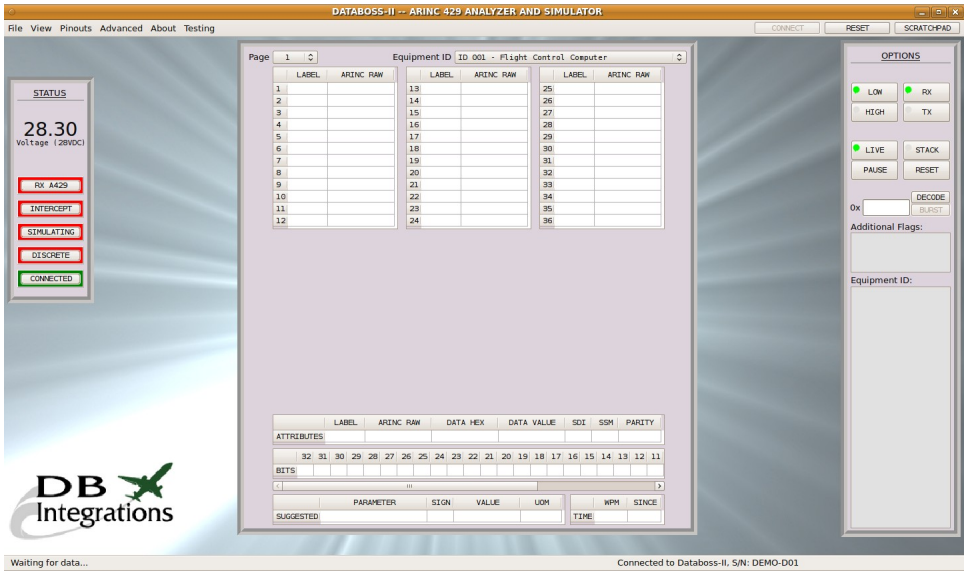
If the chosen COM port fails to open, the program will display the port as unavailable. Simply re-try the connection or click either CANCEL button to start again.



If the chosen COM port opens successfully, negotiation with the Databoss-II hardware begins. Any saved configuration settings from the Databoss will transfer to the program, which configures itself accordingly.

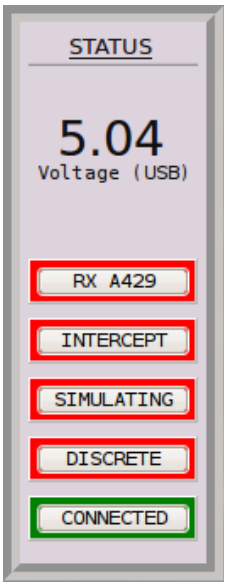


When the program is ready, the main page will appear.



Status Dashboard:

The left hand dashboard is a representation of how the unit is behaving, along with the input voltage and connection status.



Power input - Displays the current input power voltage.

RX A429 - Shows the receiving status of the ARINC 429 data under test.
Note: This is inoperative on this unit.

INTERCEPT - Shows if ARINC 429 intercept mode is active.
Note: This is inoperative on this unit.

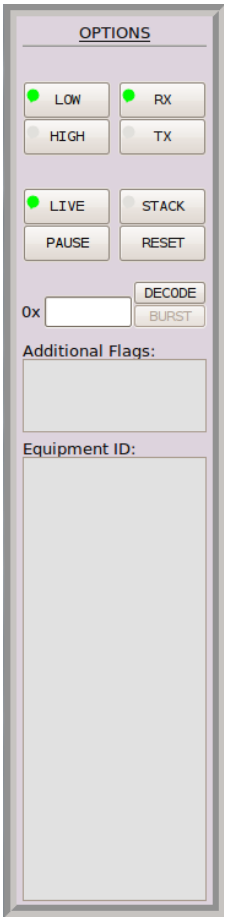
SIMULATING - Shows if the unit is transmitting any ARINC 429 data under its own processing.

DISCRETE - Shows the status of the input discrete.
Note: This is inoperative on this unit.

CONNECTED - Shows if the GUI has a valid connection with a Databoss unit.

Options:

The right hand dashboard allows for various options during operation.



LOW / HIGH - Selects the speed of the ARINC 429 databus.

RX / TX - Selects the mode of operation.

LIVE - Displays the ARINC 429 data in the tables as a whole (default).

STACK - Displays the ARINC 429 data in a progressive list (viewing the order of the words as received).

PAUSE - Stops the data from being displayed.

RESET - Clears the tables and stack list. Waits for more data.

DECODE - Decodes the ARINC 429 word in the edit box. Results display in the lower tables.

BURST - Performs a single transmission of the ARINC 429 word in the edit box. The format is a HEX representation of the 32 bits and must be 8 characters long.

Note: This option only becomes available while holding down the "CONTROL" button, to prevent inadvertent transmitting of ARINC 429 data.

Decoding Custom ARINC 429 Words:

Enter a valid ARINC 429 word in the edit box of the right hand dashboard. This word must be formatted as an 8 character HEX representation of the 32 bits with the most significant bit to the left. Press the DECODE button to display translated data in the lower tables.

Custom ARINC 429 Decoding Example:

ARINC 429 word: 0x60110017
Bit layout: MSB ⇨01100000 00010001 00000000 00010111⇦ LSB
Word to enter in decode edit box: 60110017

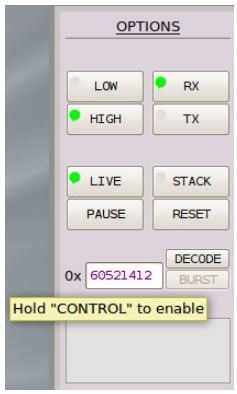
Transmitting Data:

There are six ways to transmit user defined ARINC 429 data.

- Burst transmission
- Loop transmissions:
  - IRS/FMS simulation
  - BSU/ACU simulation
  - GPS simulation
  - Custom transmission

Burst Transmission:

Enter a valid ARINC 429 word in the edit box of the right hand dashboard. This word must be formatted as an 8 character HEX representation of the 32 bits with the most significant bit to the left. Hold the "CONTROL" key and click the BURST button for each single transmission. This can only be done while in "receive" mode.

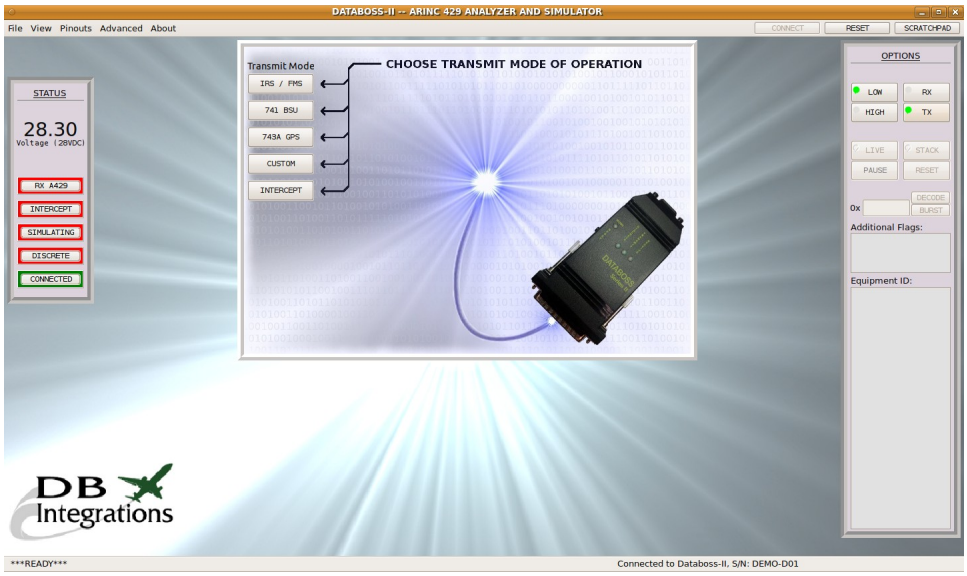


Custom ARINC 429 Burst Transmit Example:

ARINC 429 word: 0x60521412
Bit layout: MSB ⇨01100000 01010010 00010100 00010010⇦ LSB
Word to enter in decode edit box: 60521412

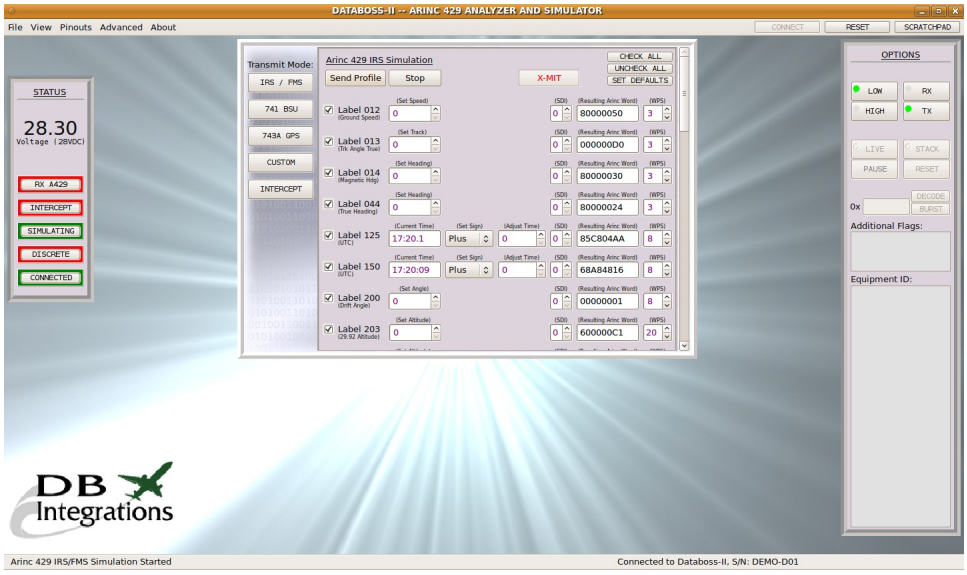
Loop Transmissions:

Click the TX button and choose the desired mode of transmit operation by clicking on one of the buttons to the left of the center window.



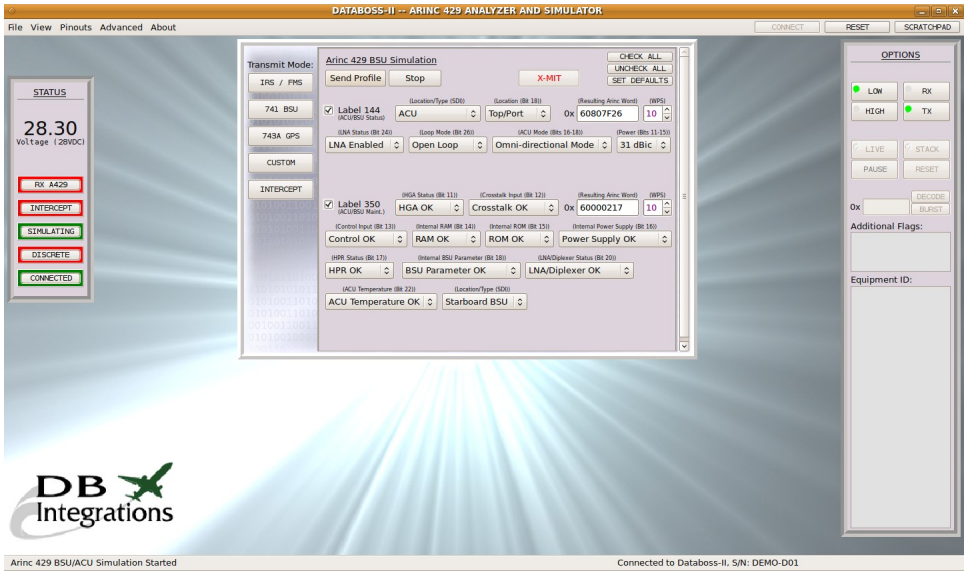
IRS/FMS Simulation:

The Databoss-II can simulate an Inertial Reference or Flight Management System using up to 35 pre-defined labels and user defined values and speeds. Time and date are automatically taken from the PC and the rest of the individual values can be changed on the fly. The words will be transmitted when their respective checkboxes to the left are selected. Version 2.4 and above incorporates an equipment prefill dropdown box. Click the Send Profile button to begin the transmissions and the Stop button to cease.



BSU/ACU Simulation:

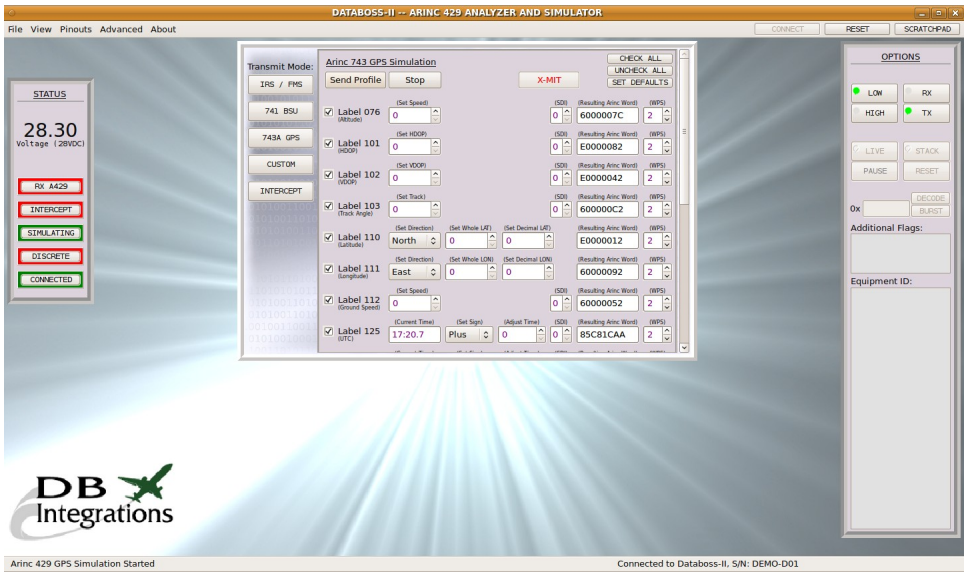
The Databoss-II can simulate an ARINC 741 Beam Steering or Antenna Control Unit using up to 2 pre-defined labels and user defined values and speeds. The words will be transmitted when their respective checkboxes to the left are selected. Click the Send Profile button to begin the transmissions and the Stop button to cease.



GPS Simulation:

The Databoss-II can simulate an ARINC 734A Global Positioning Satellite System (GNSS) using up to 12 pre-defined labels and user defined values and speeds. Time and date are automatically taken from the PC and the rest of the individual values can be changed on the fly. The words will be transmitted when their respective checkboxes to the left are selected. Click the Send Profile button to begin the transmissions and the Stop button to cease.

Note: Label 060 will be transmitted sequentially for each enabled version of the word at the transmission interval rate as defined by the first word.

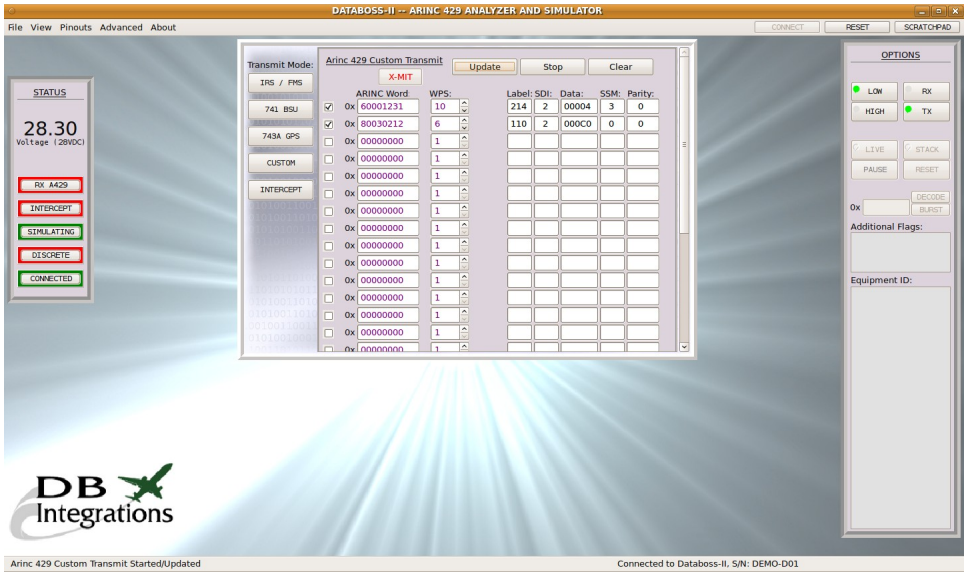


Custom Loop Transmissions:

The Databoss-II can transmit up to 25 ARINC 429 words using user defined values and speeds. The words will be transmitted when their respective checkboxes to the left are selected. Click the Send Profile button to begin the transmissions and the Stop button to cease.

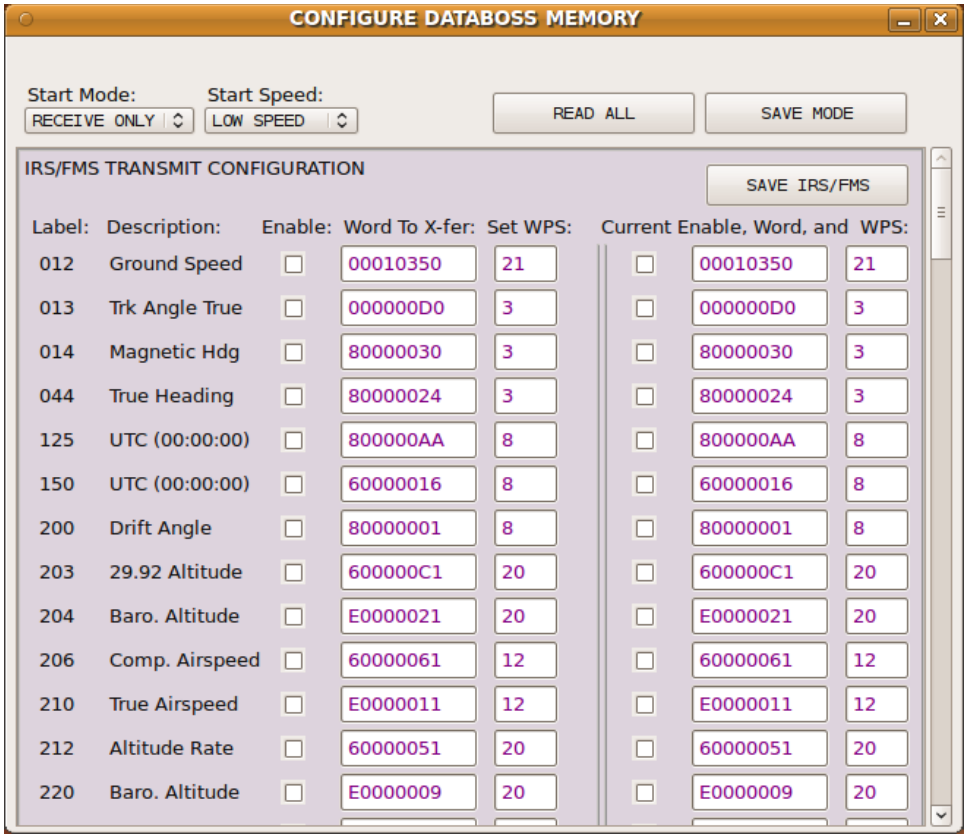
Note: The fields to the right will automatically fill in as the characters are entered.

In this mode, changing a word while the unit is actually transmitting will not automatically change the transmission word until the Update button is clicked. This is so a user can manipulate the words as necessary without disturbing the current transmissions; however, changing the rate (WPS) will dynamically set the transmission frequency without the need to press the Update button.



Configuring the Databoss:

The Databoss-II has the ability to store ARINC 429 transmit and intercept values and perform these functions upon start-up without the need for a user interface. To configure the Databoss for these options, click on "Advanced" and then "Configure Databoss" in the upper menu. This will immediately stop all transmissions and bring up the configuration page.



Configuring Databoss Mode:

The top section of the configuration page is the mode and databus speed settings for the Databoss and pertains to how the unit will perform on start-up.

START MODE:

RECEIVE ONLY –

The Databoss will do nothing on start-up except wait for incoming ARINC 429 data (normal operation).

Note: There is no receive circuitry included with this product, so this operation is inoperative.

TX IRS/FMS, TX GPS, TX BSU, or TX CUSTOM –

The Databoss will automatically transmit the ARINC 429 data with intervals and values that are stored in its non-volatile memory.

INTERCEPT –

The Databoss will automatically wait for incoming ARINC 429 data and intercept/transmit the values that are stored and enabled in its non-volatile memory.

Note: There is no receive circuitry included with this product, so this operation is inoperative.

START SPEED:

Choose “Low Speed” or “High Speed” to configure the Databoss for the incoming ARINC 429 databus speed.

READ ALL:

Click to fill in all of the information currently stored in the Databoss.

SAVE MODE:

Click to save the MODE and SPEED parameters in the Databoss's memory.

Important Time Note:

When the Databoss is transmitting data from its own memory, all time words are self-calculated from 00:00:00 on start-up. The date words are calculated from January 01 of the last year that was saved through label 260.

Configuring ARINC 429 Data:

All of the sections other than MODE and SPEED are automatically updated as the user changes values and checkbox settings in the normal transmit pages. The individual settings on this page can NOT be manipulated. The intent is that the user can make changes to the transmissions during normal operation and confirm satisfactory functionality of whichever system is being interfaced to and then save these settings via the configuration page.

On start-up, the configuration page will automatically update all of it's settings in accordance with the Databoss's memory. Each mode of operation is separated into its own section. Simply click the SAVE button for each section to transfer these values to the Databoss's non-volatile memory. The screen will become disabled once this process begins and will re-enable once complete. The values to the right (current Databoss values) should then match the values to the left (of their respective section).

More Options:

Reset:

Click the RESET button at the upper, right hand corner to bring both the GUI and Databoss back to default settings. This will NOT affect the internal configuration of the Databoss. Default parameters are:

- Receive mode
- Table display
- Tables cleared
- ARINC 429 receive un-paused
- Intercept mode deactivated
- TCAS mode deactivated

Scratchpad:

Click the SCRATCHPAD button at the upper, right hand corner to bring up a window which can be used to enter any notes or relevant information during operation.

Contact Us:

Please feel free to contact us if you need any additional help with the operation of this device.

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Allentown, PA 18109

Phone: (610) 443-0201
Fax: (732) 486-0211

Email: support@db-integrations.com
Web: www.db-integrations.com

Warranty:

DB Integrations offers a 1 year warranty on any malfunction of this device that does not relate to abuse. Technicians are available during normal working hours to help diagnose and approve units for return should they become defective. See contact information above. Warranty information is tracked internally by sales figures.

Databoss-II Software Versions:

As the Databoss-II configuration options evolve and expand, the Graphic User Interface (GUI) program must also follow suit, to ensure the best performance of the system. Please ensure that the correct program is used for the Databoss's software version. The sticker on the unit will display what the current version is. Any program version in the whole number family will work and the latest versions are always available for download at www.db-integrations.com.