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This bulletin covers the use of 0-5 VDC GBAS and 0-10 VDC GBAS with the 20 through 60 ton IntelliPak® Air Cooled Chiller units.

Section 1: Covers 0-5 VDC GBAS.

Section 2: Covers 0-10 VDC GBAS.

“SECTION 1”

0-5 VDC GBAS

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Programming

The GBAS 0-5 VDC Module I/O Assignments Submenu and status screens appear on the Human Interface only if the GBAS 0-5 VDC Module is installed.

GBAS 0-5VDC Module I/O Assignments Press ENTER to Review or Adjust

- There are 4 analog inputs available on the GBAS 0-5 VDC Module. The GBAS 0-5 VDC Analog Input Assignments setup screens allow the user to select assignments for each analog input: Leaving Solution Setpoint, Ice Build Terminate Setpoint, Hot Start Load Limit Setpoint, Capacity Limit Setpoint, or Not Assigned.

GBAS 0-5VDC Analog Input 1 Assignment NOT ASSIGNED
GBAS 0-5VDC Analog Input 2 Assignment NOT ASSIGNED
GBAS 0-5VDC Analog Input 3 Assignment NOT ASSIGNED
GBAS 0-5VDC Analog Input 4 Assignment NOT ASSIGNED

NOTE: Once you have defined a GBAS 0-5 VDC Analog Input Assignment, you must also program that setpoint to get its value from GBAS 0-5 VDC in the Setpoint Source Selection menu on the Human Interface.

- There are 5 binary outputs available on the GBAS 0-5 VDC Module. The GBAS 0-5 VDC Binary Output Definition setup screens allow the user to select assignments for each binary output: Indicate Selected Diag Alarms, Indicate Unit At Max Capacity, Indicate Any Comp Is Running, or Output Is Not Assigned.

GBAS 0-5VDC Binary Output 1 Definition Output Is Not Assigned
GBAS 0-5VDC Binary Output 2 Definition Output Is Not Assigned
GBAS 0-5VDC Binary Output 3 Definition Output Is Not Assigned
GBAS 0-5VDC Binary Output 4 Definition Output Is Not Assigned
GBAS 0-5VDC Binary Output 5 Definition Output Is Not Assigned

The GBAS 0-5 VDC Output Alarm Assignments status screens appear after the corresponding definition screen only if that binary output is set to Indicate Selected Diag Alarms. This screen allows the user to specify if the binary output will respond to Any Active Diagnostic or specific diagnostics. If Any Active Diagnostic is selected (YES), individual diagnostics will not appear. If Any Active Diagnostic is not selected (NO), the Previous/Next keys will scroll through all available diagnostics. Any combination of diagnostics can be assigned to a binary output.

GBAS 0-5VDC Output 2 Alarm Assignments Press Enter to Review or Adjust

Assign Diag to GBAS 0-5VDC Output # 2 ? Any Active Diagnostic (NO)

Analog Inputs

The terminal board hookup locations for each GBAS 0-5 VDC analog input is as follows:

ANALOG INPUTS		
#	Terminal Hookup Locations	
	positive (+)	negative (-)
1	1TB16-1	1TB16-2
2	1TB16-3	1TB16-4
3	1TB16-7	1TB16-8
4	1TB16-9	1TB16-10

The range for each analog input setpoint, as well as corresponding voltage ranges, are as follows:

SETPOINT	SETPOINT RANGE	VOLTAGE RANGE
Leaving Solution Setpoint	Special	0.5 to 4.5 VDC
	20 to 29 degrees F	0.5 to 4.5 VDC
	30 to 39 degrees F	0.5 to 4.5 VDC
	40 to 50 degrees F	0.5 to 4.5 VDC
	51 to 65 degrees F	0.5 to 4.5 VDC
Ice Build Terminate Setpoint	20 to 31 degrees F	0.5 to 4.5 VDC
Hot Start/Load Limit Setpoint	60 to 80 degrees F	0.5 to 4.5 VDC
Capacity Limit Setpoint (For MCM Units)	0%	0.5 VDC (+/- 0.25 VDC)
	25%	1.5 VDC (+/- 0.25 VDC)
	50%	2.5 VDC (+/- 0.25 VDC)
	75%	3.5 VDC (+/- 0.25 VDC)
	100%	4.5 VDC (+/- 0.25 VDC)
Capacity Limit Setpoint (For SCM Units)	0%	0.5 VDC (+/- 0.25 VDC)
	50%	2.5 VDC (+/- 0.25 VDC)
	100%	4.5 VDC (+/- 0.25 VDC)

NOTE: If an input signal is lost, the setpoint will "clamp" to the low end of the setpoint scale (0.5 VDC) and no diagnostic will result. Also, any input under 0.5 VDC will be considered 0.5 VDC and any input over 4.5 VDC will be considered 4.5 VDC.

Binary Outputs

The terminal board hookup locations for each GBAS 0-5 VDC binary outputs is as follows:

BINARY OUTPUTS			
#	Terminal Hookup Locations		
	common	normally open	normally closed
1	1TB16-16	1TB16-15	1TB16-17
2	1TB5-8	1TB5-7	1TB5-9
3	1TB5-11	1TB5-10	1TB5-12
4	1TB5-14	1TB5-13	1TB5-15
5	1TB16-13	1TB16-12	1TB16-14

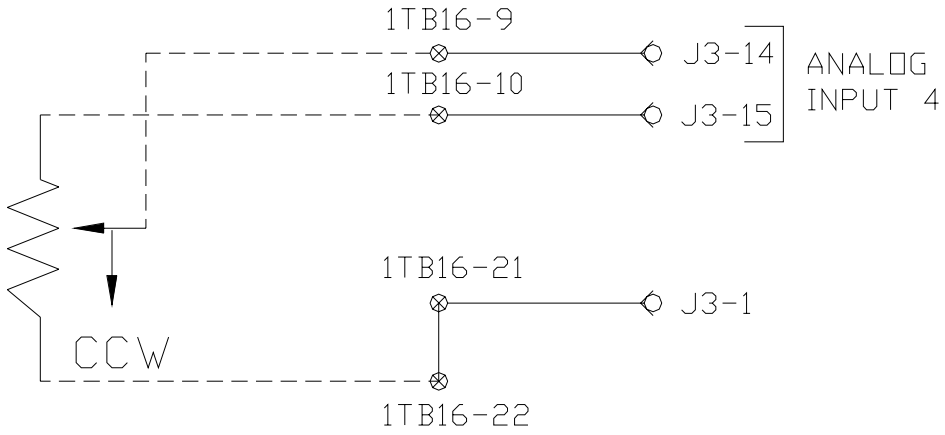
Demand Limit Contact

The terminal board hookup locations for the GBAS 0-5 VDC demand limit contact input is as follows:

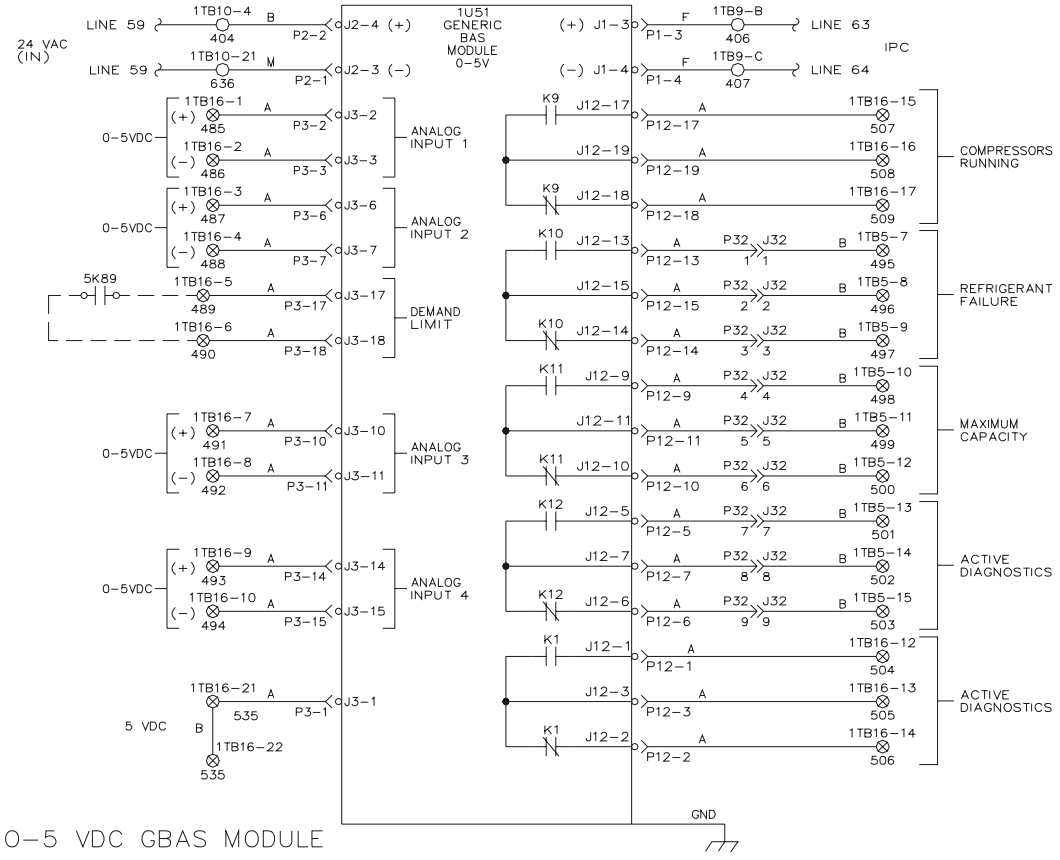
DEMAND LIMIT CONTACT INPUT	
Terminal Hookup Locations	
1TB16-5	1TB16-6

Potentiometer Use

The GBAS 0-5 VDC modules has a regulated 5 VDC output that may be used in conjunction with a potentiometer to provide a setpoint as an alternative to using an external 0-5 VDC signal (see diagram below). Recommended potentiometer value is from 1K-ohm to 100K-ohm.



Schematic


24 VAC (IN)
LINE 59
1TB10-4
404
P2-2
J2-4 (+)
LINE 59
1TB10-21
636
P2-1
J2-3 (-)
1U51 GENERIC BAS MODULE 0-5V
(+) J1-3
P1-3
1TB9-B
406
LINE 63
(-) J1-4
P1-4
1TB9-C
407
LINE 64
IPC
0-5VDC
1TB16-1
485
P3-2
J3-2
1TB16-2
486
P3-3
J3-3
ANALOG INPUT 1
1TB16-3
487
P3-6
J3-6
1TB16-4
488
P3-7
J3-7
ANALOG INPUT 2
5K89
1TB16-5
489
P3-17
J3-17
1TB16-6
490
P3-18
J3-18
DEMAND LIMIT
1TB16-7
491
P3-10
J3-10
1TB16-8
492
P3-11
J3-11
ANALOG INPUT 3
1TB16-9
493
P3-14
J3-14
1TB16-10
494
P3-15
J3-15
ANALOG INPUT 4
5 VDC
1TB16-21
535
P3-1
J3-1
1TB16-22
535
K9
J12-17
P12-17
1TB16-15
507
J12-19
P12-19
1TB16-16
508
K9
J12-18
P12-18
1TB16-17
509
COMPRESSORS RUNNING
K10
J12-13
P12-13
P32 1
J32 1
1TB5-7
495
J12-15
P12-15
P32 2
J32 2
1TB5-8
496
K10
J12-14
P12-14
P32 3
J32 3
1TB5-9
497
REFRIGERANT FAILURE
K11
J12-9
P12-9
P32 4
J32 4
1TB5-10
498
J12-11
P12-11
P32 5
J32 5
1TB5-11
499
K11
J12-10
P12-10
P32 6
J32 6
1TB5-12
500
MAXIMUM CAPACITY
K12
J12-5
P12-5
P32 7
J32 7
1TB5-13
501
J12-7
P12-7
P32 8
J32 8
1TB5-14
502
K12
J12-6
P12-6
P32 9
J32 9
1TB5-15
503
ACTIVE DIAGNOSTICS
K1
J12-1
P12-1
1TB16-12
504
J12-3
P12-3
1TB16-13
505
ACTIVE DIAGNOSTICS
K1
J12-2
P12-2
1TB16-14
506
GND
0-5 VDC GBAS MODULE

“SECTION 2”

0-10 VDC GBAS

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Programming

The GBAS 0-10 VDC Module I/O Assignments Submenu and status screens appear on the Human Interface only if the GBAS 0-10 VDC Module is installed.

GBAS 0-10VDC Module I/O Assignments Press ENTER to Review or Adjust

- There are 4 analog inputs available on the GBAS 0-10 VDC Module. The GBAS 0-10 VDC Analog Input Assignments setup screens allow the user to select assignments for each analog input: Leaving Solution Setpoint, Ice Build Terminate Setpoint, Hot Start Load Limit Setpoint, Capacity Limit Setpoint, or Not Assigned.

GBAS 0-10VDC Analog Input 1 Assignment NOT ASSIGNED

GBAS 0-10VDC Analog Input 2 Assignment NOT ASSIGNED

GBAS 0-10VDC Analog Input 3 Assignment NOT ASSIGNED

GBAS 0-10VDC Analog Input 4 Assignment NOT ASSIGNED

NOTE: Once you have defined a GBAS 0-10 VDC Analog Input Assignment, you must also program that setpoint to get its value from GBAS 0-10 VDC in the Setpoint Source Selection menu on the Human Interface.

- There is 1 binary output available on the GBAS 0-10 VDC Module. The GBAS 0-10 VDC Binary Output Definition setup screen allows the user to select an assignment for the binary output: Indicate Selected Diag Alarms, Indicate Unit At Max Capacity, Indicate Any Comp Is Running, or Output Is Not Assigned.

GBAS 0-10VDC Binary Output Definition Output Is Not Assigned

The GBAS 0-10 VDC Output Alarm Assignment status screen appears after the definition screen only if the binary output is set to Indicate Selected Diag Alarms. This screen allows the user to specify if the binary output will respond to Any Active Diagnostic or specific diagnostics (a complete DIAGNOSTICS LIST is available at the end of SECTION 2). If Any Active Diagnostic is selected (YES), individual diagnostics will not appear. If Any Active Diagnostic is not selected (NO), the Previous/Next keys will scroll through all available diagnostics. Any combination of diagnostics can be assigned to a binary output.

GBAS 0-10VDC Output Alarm Assignment Press Enter to Review or Adjust

Assign Diag to GBAS 0-10VDC Output ? Any Active Diagnostic (NO)

- There are 4 analog outputs available on the GBAS 0-10 VDC Module. The GBAS 0-10 VDC Analog Output Assignments setup screens allow the user to select assignments for each analog output:

Leaving Solution Temperature	Ckt1 Liquid Line Pressure
Entering Solution Temperature	Ckt2 Liquid Line Pressure
Ckt1 Saturated Condenser Temp	Ckt1 Sat Liquid Temp
Ckt2 Saturated Condenser Temp	Ckt2 Sat Liquid Temp
Ckt1 Suction Temperature	ICS Defined Temperature
Ckt2 Suction Temperature	Outside Air Temperature
Ckt1 Suction Pressure	Active Cooling Capacity
Ckt2 Suction Pressure	Output Is Not Assigned

NOTE: Some output assignments may not be available depending on the options installed in the unit.

GBAS 0-10VDC Analog Output1 Assignment
NOT ASSIGNED

GBAS 0-10VDC Analog Output2 Assignment
NOT ASSIGNED

GBAS 0-10VDC Analog Output3 Assignment
NOT ASSIGNED

GBAS 0-10VDC Analog Output4 Assignment
NOT ASSIGNED

Analog Inputs

The terminal board hookup locations for each GBAS 0-10 VDC analog input is as follows:

ANALOG INPUTS		
#	Terminal Hookup Locations	
	positive (+)	negative (-)
1	1TB17-3	1TB17-4
2	1TB17-5	1TB17-6
3	1TB17-7	1TB17-8
4	1TB17-9	1TB17-10

The range for each analog input setpoint as well as corresponding voltage ranges are as follows:

SETPOINT	SETPOINT RANGE	VOLTAGE RANGE
Leaving Solution Setpoint	Special	0.5 to 9.5 VDC
	20 to 29 degrees F	0.5 to 9.5 VDC
	30 to 39 degrees F	0.5 to 9.5 VDC
	40 to 50 degrees F	0.5 to 9.5 VDC
	51 to 65 degrees F	0.5 to 9.5 VDC
Ice Build Terminate Setpoint	20 to 31 degrees F	0.5 to 9.5 VDC
Hot Start/Load Limit Setpoint	60 to 80 degrees F	0.5 to 9.5 VDC
Capacity Limit Setpoint (For MCM Units)	0%	1.0 VDC (+/- 0.5 VDC)
	25%	3.0 VDC (+/- 0.5 VDC)
	50%	5.0 VDC (+/- 0.5 VDC)
	75%	7.0 VDC (+/- 0.5 VDC)
	100%	9.0 VDC (+/- 0.5 VDC)
Capacity Limit Setpoint (For SCM Units)	0%	1.0 VDC (+/- 0.5 VDC)
	50%	5.0 VDC (+/- 0.5 VDC)
	100%	9.0 VDC (+/- 0.5 VDC)

NOTE: If an input signal is lost, the setpoint will "clamp" to the low end of the setpoint scale (0.5 VDC) and no diagnostic will result. Also, any input under 0.5 VDC will be considered 0.5 VDC and any input over 9.5 VDC will be considered 9.5 VDC.

Binary Output

The terminal board hookup locations for each GBAS 0-10 VDC binary output is as follows:

BINARY OUTPUT		
Terminal Hookup Locations		
common	normally open	normally closed
1TB17-13	1TB17-12	1TB17-14

Demand Limit Contact

The terminal board hookup locations for the GBAS 0-10 VDC demand limit contact input is as follows:

DEMAND LIMIT CONTACT INPUT	
Terminal Hookup Locations	
1TB17-1	1TB17-2

Analog Outputs

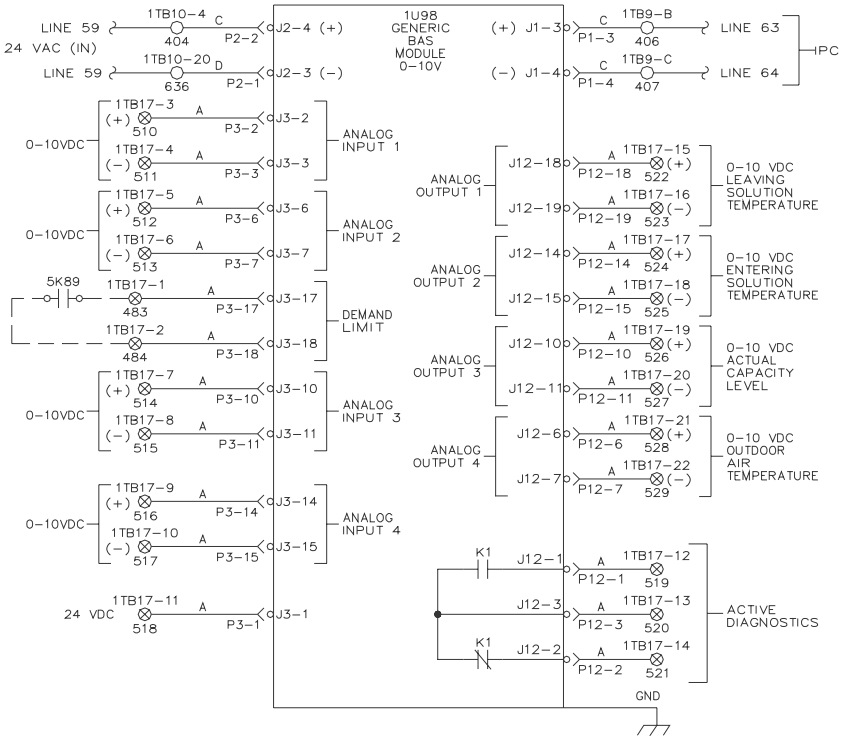
The terminal board hookup locations for each GBAS 0-10 VDC analog output is as follows:

ANALOG OUTPUT		
#	Terminal Hookup Locations	
	positive (+)	negative (-)
1	1TB17-15	1TB17-16
2	1TB17-17	1TB17-18
3	1TB17-19	1TB17-20
4	1TB17-21	1TB17-22

The range for each analog output as well as corresponding voltage ranges are as follows:

STATUS	STATUS RANGE	VOLTAGE RANGE
Leaving Solution Temperature	-40 to 200 degrees F	0.5 to 9.5 VDC
Entering Solution Temperature	-40 to 200 degrees F	0.5 to 9.5 VDC
Saturated Condenser Temp. Ckt 1	-40 to 200 degrees F	0.5 to 9.5 VDC
Saturated Condenser Temp. Ckt 2	-40 to 200 degrees F	0.5 to 9.5 VDC
Suction Temp. Ckt 1	-40 to 200 degrees F	0.5 to 9.5 VDC
Suction Temp. Ckt 2	-40 to 200 degrees F	0.5 to 9.5 VDC
ICS Defined Temperature	-40 to 200 degrees F	0.5 to 9.5 VDC
Outdoor Air Temperature	-40 to 200 degrees F	0.5 to 9.5 VDC
Saturated Liquid Temp. Ckt 1	-40 to 200 degrees F	0.5 to 9.5 VDC
Saturated Liquid Temp. Ckt 2	-40 to 200 degrees F	0.5 to 9.5 VDC
Liquid Line Pressure Ckt 1	0 to 400 PSI	0.5 to 9.5 VDC
Suction Pressure Ckt 1	0 to 100 PSI	0.5 to 9.5 VDC
Liquid Line Pressure Ckt 2	0 to 400 PSI	0.5 to 9.5 VDC
Suction Pressure Ckt 2	0 to 100 PSI	0.5 to 9.5 VDC
Active Cooling Capacity (For MCM Units)	0%	1 VDC
	25%	3 VDC
	50%	5 VDC
	75%	7 VDC
	100%	9 VDC
Active Cooling Capacity (For SCM Units)	0%	1 VDC
	50%	5 VDC
	100%	9 VDC

Schematic



0–10 VDC GBAS MODULE