

B063

SERIAL CONTROLLER



Handbook

Version 1.0



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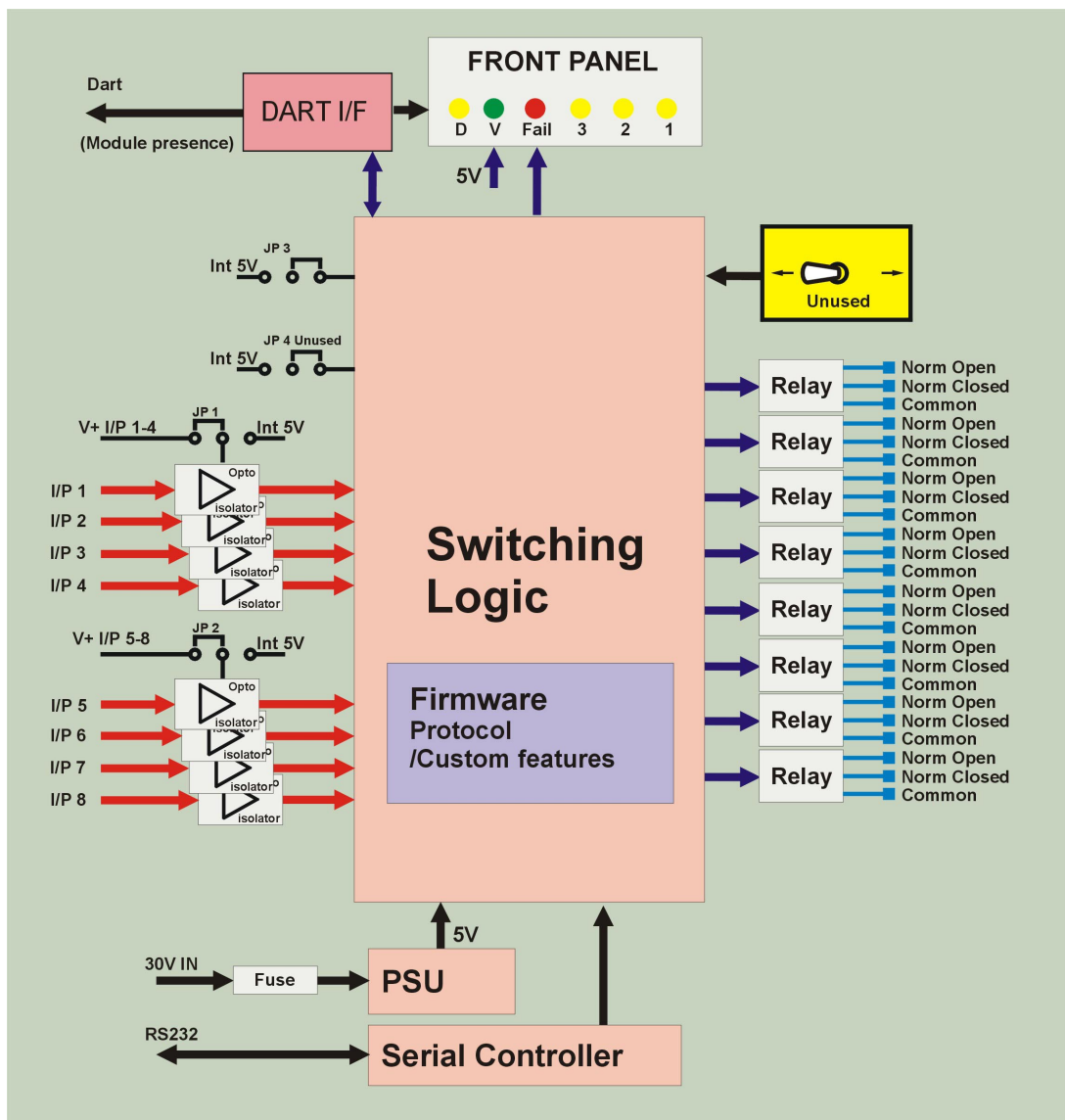
Firmware covered Version – 01 (Sandar Prosan) used to interface between the Tandberg control system and up to four 2x1 B043 switches.
Version – 02 (Universal) used to interface between the Harmonic controller and up to four 2x1 B043 switches.

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Introduction

The B063 is a serial control module that converts serial commands to general-purpose inputs and outputs. It fits in either the 1U F010 or 3U Vistek frames and all power is derived from the frame PSU. A passive rear connector is required for all signal interconnections (see Installation chapter).



The B063 Serial Controller

The module includes an RS232 serial connection, 8 opto coupled inputs and 8 independent relay outputs. It has a front panel switch (available for a customer specified purpose such as local/remote, auto/manual or other application) and 6 LEDs of which four are used to show

Power, DART, System and RS232 activity, but the others (labelled 1 and 2) are available for custom applications.

There are currently two versions of the B063 module.

Version – 01

The module is designed to convert the serial commands of a Sandar Prosan protocol to relay closing contacts (see Appendix A).

In the standard application, outputs 1-4 control the four switches (on 2x Hawkeye B043 dual 2x1 switch modules). Output 7 is a 'card local' alarm and output 8 is a 'switch not true' alarm. Inputs 1-4 are path 2 revertives (closed = path 2 selected), used for tallies from the switches, and inputs 5-8 are local control revertives (closed = local control selected) used for indicating that the switch module was in local rather than remote control mode.

Version – 02

This version is designed to convert the serial commands of a Universal protocol to relay closing contacts (see Appendix B).

Outputs 1-4 control the four switches (on 2x Hawkeye B043 dual 2x1 switch modules). Output 5 is for connection to a 2nd B063 module (for redundancy) and all other inputs are unused. Inputs 1-4 are path 2 revertives (closed = path 2 selected, open = path 1), used for tallies from the switches, and input 5 is for connection to a 2nd B063. All other inputs are unused.

Main features

- 8 in 8 out serial controller for Vistek frames (contact factory for Avitel frames)
- Opto isolated inputs and relay outputs
- Options for internal or external opto-isolator pull up voltage
- DART module presence/absence monitoring
- Front panel LED's show Dart status, PSU status, system fault, RS232 activity – two LEDs available for custom functions
- Front panel toggle switch available (currently unassigned)

dB Broadcast also offers the option of customised software to match a customer's particular application.

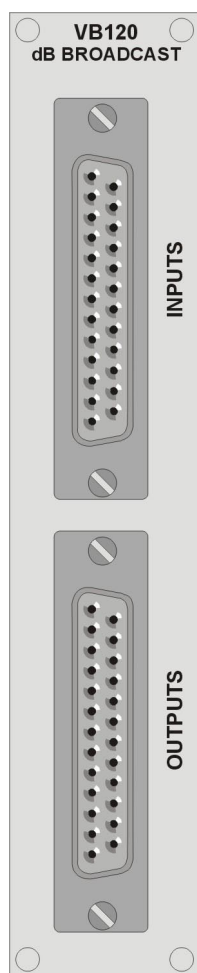
The presence (or absence) of the B063 can be monitored via DARTnet using Vistek's ViewFind and/or a Vistek V1605 control panel.

Installation

Selecting rear connectors

The available rear connectors and the frames/signal I/O used are as follows:

Type	Frame	Connectors	Signal types
Contact Factory VB120	1U/3U Avitel	Contact Factory	Contact Factory
	1U(F010)/3U Vistek	2 X 25 way 'D' types	



*1U(F010)/3U Vistek
style chassis VB120*

OUTPUTS - 25 way D type		INPUTS - 25 way D type	
PIN	OUTPUTS 1-8	PIN	INPUTS 1-8 / RS232
1	Out-8 NO	1	Input-01
2	Out-8 Common	2	Input-03
3	Out-7 NC	3	0V Ground
4	Out-6 NO	4	0V Ground
5	Out-6 Common	5	Input-05
6	Out-5 NC	6	Input-07
7	Out-4 NO	7	N/C
8	Out-4 Common	8	N/C
9	Out-3 NC	9	0V Ground
10	Out-2 NO	10	0V Ground
11	Out-2 Common	11	N/C
12	Out-1 NC	12	N/C
13	+Ve Vistek Supply	13	+Ve Vistek Supply
14	Out-8 NC	14	Input-02
15	Out-7 NO	15	Input-04
16	Out-7 Common	16	V+ Inputs 1-4
17	Out-6 NC	17	V+ Inputs 5-8
18	Out-5 NO	18	Input-06
19	Out-5 Common	19	Input-08
20	Out-4 NC	20	RS232 TX Data
21	Out-3 NO	21	RS232 RX Data
22	Out-3 Common	22	RS232 0V Ground
23	Out-2 NC	23	RS232 0V Ground
24	Out-1 NO	24	RS232 Handshake Out
25	Out-1 Common	25	RS232 Handshake In

I/O function assignments

The functions assigned to the inputs and outputs are dependent of the protocol installed on the module. The following tables describe the functions assigned for each version:

Version 01

Input Assignments – Sandar Prosan – version 01	
Input 1	Revertive for switch 1 (closed for path 2 selected, open for path 1 selected)
Input 2	Revertive for Switch 2
Input 3	Revertive for Switch 3
Input 4	Revertive for Switch 4
Input 5	Local/remote control revertive for Switch 1 (closed for Local control)
Input 6	Local/remote control revertive for Switch 2
Input 7	Local/remote control revertive for Switch 3
Input 8	Local/remote control revertive for Switch 4

Ouput Assignments – Sandar Prosan – version 01	
Output 1	Switch 1
Output 2	Switch 2
Output 3	Switch 3
Output 4	Switch 4
Output 5	Not used
Output 6	Not used
Output 7	Card Local alarm
Output 8	Switch not true alarm

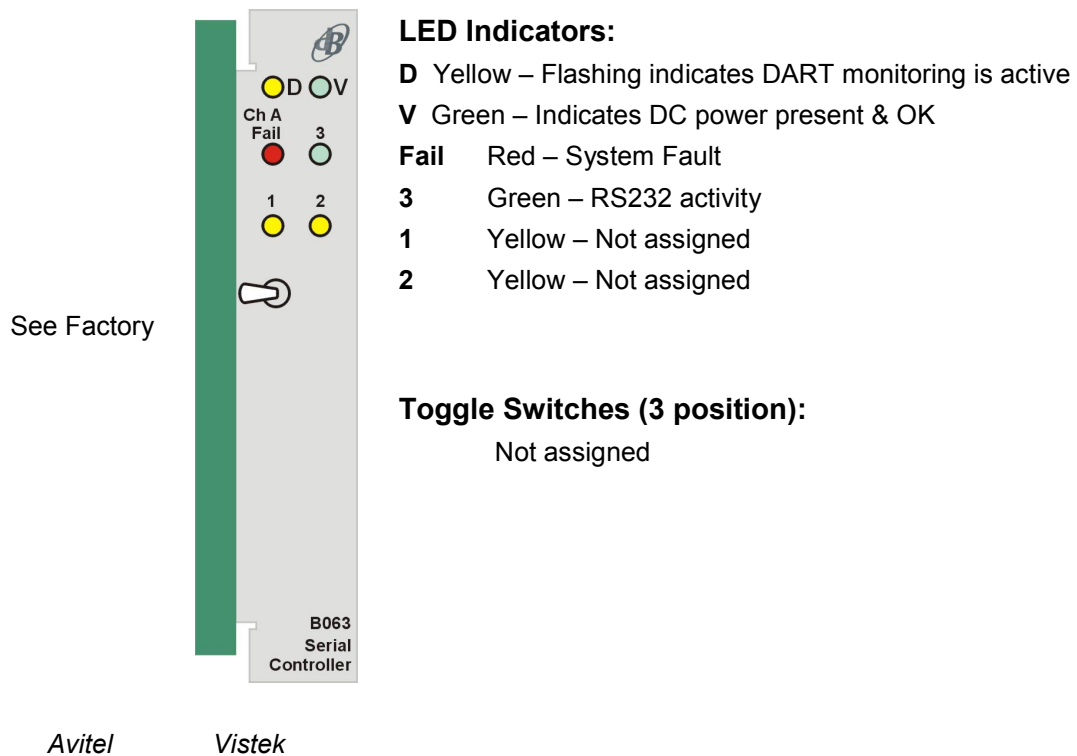
Version 02

Input Assignments – Universal – version 02	
Input 1	Revertive for switch 1 (closed for path 2 selected, open for path 1 selected)
Input 2	Revertive for Switch 2
Input 3	Revertive for Switch 3
Input 4	Revertive for Switch 4
Input 5	Control flag from a second (Redundant) B063 module
Input 6	Not used
Input 7	Not used
Input 8	Not used

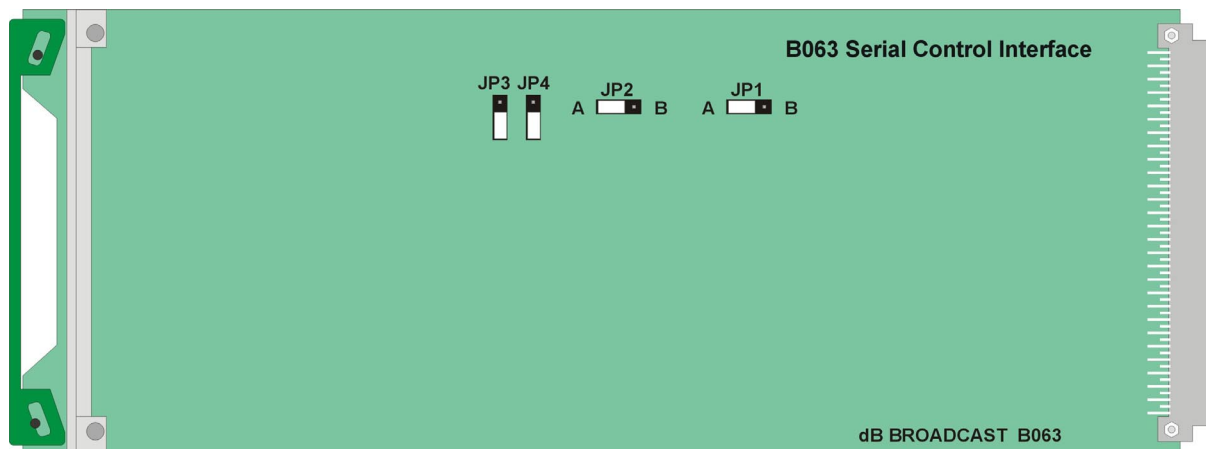
Output Assignments – Universal – version 02	
Output 1	Switch 1
Output 2	Switch 2
Output 3	Switch 3
Output 4	Switch 4
Output 5	Control flag to a second (Redundant) B063 module
Output 6	Not used
Output 7	Not used
Output 8	Not used

Configuration and operation

Front panel control



Configuration



The B063 Serial Controller showing jumper links

Link functions

Version 01 - Prosan

Jumper No	Jumpers
JP1	Position A: Inputs 1-4 external pull-up Position B: Inputs 1-4 internal pull-up to 5V
JP2	Position A: Inputs 5-8 external pull-up Position B: Inputs 5-8 internal pull-up to 5V
JP3	Position 0: All switches separate Position 1: All switches linked
JP4	Not assigned

Version 02 - Universal

Jumper No	Jumpers
JP1	Position A: Inputs 1-4 external pull-up Position B: Inputs 1-4 internal pull-up to 5V
JP2	Position A: Inputs 5-8 external pull-up Position B: Inputs 5-8 internal pull-up to 5V
JP3	Not assigned
JP4	Not assigned

Sample problems and their solutions

The unit does not appear to operate correctly

Check that the green 'V' LED is illuminated and that the module is seated correctly in the frame.

Check that the appropriate rear connector has been wired correctly.

Check that any required external operating voltages are present and that jumpers JP1 and JP2 are set appropriately.

There is no DART presence/absence monitoring

Ensure that the frame has been fitted with the DART control module. In the Vistek 3RU frame this is the V606 module.

There is no individual channel control with version 01

Check that JP3 is not in the 'All Channels Linked' position.

Ordering information

B063 types

Different frames require different mechanical fittings. All module functionality is identical.

B063/V	Version for Vistek Chassis
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3U Vistek configuration

V1606-dB-2PSU	3U Chassis, 14 Module slots, 2 PSU slots (2 PSUs included)
V1606-dB-48V	3U Chassis, 14 Module slots, 2 48V PSU slots (2 48V PSUs included)
VB120	Rear connector module

1U Vistek configuration (dual PSU)

F010	1U Chassis, 2 Module slots, 2 PSUs (PSUs included)
VB120	Rear connector module

Note: Contact factory for Avitel compatible modules and rear connectors.

Appendix A

Sandar Prosan Protocol Interface

Serial interface configuration

Start bits: 1

Stop bits: 1

Data bits: 7

Transmission data rate: 9600 Baud

Parity check: Odd

Handshake: Disabled

Reading and writing messages

Messages between the B063 Serial Controller and a host computer are transferred as records, i.e. data between unique start and stop characters. As soon as a complete record is received, the receiver returns the character ACK (06 hex) if the record is correctly received and recognised. If the record is incorrectly received or not recognised, the receiver returns a NAK (15 hex) character. If the transmitter receives NAK (or no answer within about 2 seconds), it retransmits the message. A maximum of 3 retransmission attempts is made. The record has a checksum built in, inserted between the last data character and the stop character. The checksum is modulo 256 sum of all data characters in the record and is transmitted as 2 characters (hexadecimal). The record start character is STX (02 hex), and the record stop character is ETX (03 hex). ACK, NAK, STX and ETX cannot be transmitted as data characters.

ACK = complete record received

NAK = incomplete or defect record received

STX = record start

ETX = record end

Structure:

<STX><command-or-query><checksum><ETX>

Receipt <ACK> or <NAK>

STX = 0x02

Command/Query = see below

CHECKSUM = sum/modulo 256 in hex

ETX = 0x03

ACK = 0x06

NAK = 0x15

Commands:

Reset (R)

<STX>R<CHECKSUM><ETX>

The card will answer

<STX>Rnn<CHECKSUM><ETX>

where nn is the status byte (see Status request).

On receipt of Reset all four relays are switched to path 1.

Status request (Q)

Status request may be sent any time to the card.

<STX>Q<CHECKSUM><ETX>

The card will answer:

<STX>Qnn<CHECKSUM><ETX>

where nn is:

00 = Status OK

02 = Syntax Error received

06 = NAK received

01 = Summary alarm (Switch not true or in local control)

System Identification (XR)

<STX>XR<CHEKSUM><ETX>

The card will answer with the identification of itself, typically:

<STX>XR:dB Broadcast B063 Controller Rel.1.0<CHECKSUM><ETX>

Set signal path (M)

<STX>Mxxx:yyy<CHECKSUM><ETX>

where:

xxx = the switch number 001, 002, 003 or 004

yyy = the signal path (001 = path 1, 002 = path 2)

Read status of signal path (S or SA)

<STX>S<CHECKSUM><ETX>

The card will answer with a one-zero sequence for each switch channel

<STX>S:aaa,bbb,ccc,ddd <CHECKSUM><ETX>

where aaa,bbb,ccc,ddd are 001 or 002.

001 means that the channel is switched to path 1 and 002 means that the channel is switched to path 2.

Appendix B

Universal Protocol Interface

Serial interface configuration

Start bits: 1

Stop bits: 1

Data bits: 7

Transmission data rate: 9600 Baud

Parity check: Odd

Handshake: Disabled

Reading and writing messages

Each command ends with a {CR} character (or '\r' for C++ char).

1. Hardware model query command

VER{CR}

Expected device response is a string.

If the string contains "10942A", it's an older model; the link is set one level at time. If the response contains "10942B", a newer model is assumed that supports setting links on multiple levels simultaneously. If the device doesn't respond to "VER" command, it is considered timed out. It is recommended that the customized switch respond with some pre-defined hardware model, in addition to "10942B".

2. Connect command (connect output to backup input)

C001001{CR}

Connect J1 to J1B (Backup)

Expected response: C001001{CR}

C002001{CR}

Connect J2 to J2B,

Expected response: C002001{CR}

C003001{CR}

Connect J3 to J3B

Expected response: C003001{CR}

C004001{CR}

Connect J4 to J4B

Expected response: C004001{CR}

The B063 also supports concatenated commands, which means set links on multiple levels. (may set up to all 4 levels at once). for example:

C001001, C002001, C003001{CR}

Connect J1 to J1B, J2 to J2B, J2 to J2B, J3 to J3B, simultaneously

Expected response: C001001, C002001, C003001{CR}

3. *Disconnect command (connect output to default input)*

D001001{CR}

Connect J1 to J1A (Default)

Expected response: D001001{CR}

D002001{CR}

Connect J2 to J2A

Expected response: D002001{CR}

D003001{CR}

Connect J3 to J3A

Expected response: D003001{CR}

D004001{CR}

Connect J4 to J4A

Expected response: D004001{CR}

The B063 also supports concatenated commands, which means set links on multiple levels. (may set up to all 4 levels at once). for example:

D001001, D002001, D003001{CR}

Connect J1 to J1A, J2 to J2A, J2 to J2A, J3 to J3A, simultaneously

Expected response: D001001, D002001, D003001{CR}

4. *Query command (query link status)*

V001001{CR}

Query the link status of J1

expected response: C001001{CR}, or D001001{CR}

V002001{CR}

Query the link status of J2

Expected response: C002001{CR}, or D002001{CR}

V003001{CR}

Query the link status of J3

Expected response: C003001{CR}, or D003001{CR}

V004001{CR}

Query the link status of J4

Expected response: C004001{CR}, or D004001{CR}

The B063 also supports concatenated commands, which means query status on multiple levels. (may query up to all 4 levels at once), for example:

V001001, V002001, V003001{CR}

Connect J1 to J1A, J2 to J2A, J2 to J2A, J3 to J3A, simultaneously

Expected response: C001001, C002001, C003001{CR}

or D001001, D002001, D003001{CR} depends on the link status of the switch