



Instruction manual



**Operational instructions  
for  
Shut-Off Valve Control Adapter**

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**ATTENTION**

**Please read this instruction manual carefully before installing and operating the instrument.  
Not following the guidelines could result in personal injury and/or damage to the equipment.**

## Disclaimer

Even though care has been taken in the preparation and publication of the contents of this manual, we do not assume legal or other liability for any inaccuracy, mistake, mis-statement or any other error of whatsoever nature contained herein. The material in this manual is for information purposes only, and is subject to change without notice.

Bronkhorst High-Tech B.V.  
July 2011

## Symbols



*Important information. Discarding this information could cause injuries to people or damage to the Instrument or installation.*



*Helpful information. This information will facilitate the use of this instrument.*



*Additional info available on the internet or from your local sales representative.*

## Warranty

The products of Bronkhorst High-Tech B.V. are warranted against defects in material and workmanship for a period of three years from the date of shipment, provided they are used in accordance with the ordering specifications and the instructions in this manual and that they are not subjected to abuse, physical damage or contamination. Products that do not operate properly during this period may be repaired or replaced at no charge. Repairs are normally warranted for one year or the balance of the original warranty, whichever is the longer.



*See also paragraph 9 of the Conditions of sales:*

*[http://www.bronkhorst.com/files/corporate\\_headquarters/sales\\_conditions/en\\_general\\_terms\\_of\\_sales.pdf](http://www.bronkhorst.com/files/corporate_headquarters/sales_conditions/en_general_terms_of_sales.pdf)*

The warranty includes all initial and latent defects, random failures, and undeterminable internal causes.

It excludes failures and damage caused by the customer, such as contamination, improper electrical hook-up, physical shock etc.

Re-conditioning of products primarily returned for warranty service that is partly or wholly judged non-warranty may be charged for.

Bronkhorst High-Tech B.V. or affiliated company prepays outgoing freight charges when any party of the service is performed under warranty, unless otherwise agreed upon beforehand. However, if the product has been returned collect to our factory or service center, these costs are added to the repair invoice. Import and/or export charges, foreign shipping methods/carriers are paid for by the customer.

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# 1 GENERAL PRODUCT INFORMATION

## 1.1 REFERENCES TO OTHER APPLICABLE DOCUMENTS

Manuals and guides for digital instruments are modular. General instructions give information about the functioning and installation of instruments. Operational instructions explain the use of the digital instruments features and parameters. Field bus specific information explains the installation and use of the field bus installed on the instrument.

### 1.1.1 Manual and User Guides

General instructions Instrument type based	Operational instructions	Field bus specific information
<b>Document 9.17.022</b> Bronkhorst High-Tech General instructions digital Mass Flow / Pressure	<b>Document 9.17.023</b>  Operational instructions for digital multibus Mass Flow / Pressure instruments	<b>Document 9.17.024</b> FLOW-BUS interface
<b>Document 9.17.031</b> Bronkhorst Cori-Tech General instructions CORI-FLOW		<b>Document 9.17.025</b> PROFIBUS–DP interface
<b>Document 9.17.050</b> Bronkhorst Cori-Tech General instructions mini CORI-FLOW		<b>Document 9.17.026</b> DeviceNet interface
<b>Document 9.17.044</b> Bronkhorst High-Tech General instructions digital LIQUI-FLOW L30		<b>Document 9.17.035</b> Modbus interface
M+W Instruments Instruction manual MASS-STREAM D-6300		<b>Document 9.17.027</b> RS232 interface with FLOW-BUS protocol
		<b>Document 9.17.063</b> EtherCAT interface
		<b>Document 9.17.095</b> PROFINET interface
	<b>Document 9.17.068</b> Operational Instructions for Shut-Off Valve Control Adapter	

### 1.1.2 This Manual

This manual is an appendix to “9.17.023 Operational instructions for digital multibus Mass Flow / Pressure instruments” and the field bus specific manuals, with specific information for the Shut-Off Valve Control Adapter.

### 1.1.3 Technical Drawings

Hook-up diagram Shut-Off Valve Control Adapter (document nr. 9.16.099)



All these documents can be found at:  
<http://www.bronkhorst.com/en/downloads>

## 2 OPERATION PARAMETERS

### 2.1 GENERAL INFORMATION

The four least significant bits of the IO Switch Status / General Purpose IO register are used to operate the 2 shut-off valves.

IO Switch Status / General Purpose IO register								
Bit	7	6	5	4	3	2	1	0
Read / Write					R	R	R/W	R/W
	Not used	Not used	Not used	Not used	Error Valve 2	Error Valve 1	Output valve 2	Output valve 1

Decimal values 0...3 can be written to the register to operate the 2 shut-off valves.

If the read value of the register differs from the written value, probably an error occurred:

Value	Valve status	Error
0	inactive	-
1	Valve1 active	-
2	Valve2 active	-
3	Valve1 and Valve2 active	-
5	Valve1 active	Valve 1 error
7	Valve1 and Valve2 active	Valve 1 error
10	Valve2 active	Valve 2 error
11	Valve1 and Valve2 active	Valve 2 error
12	inactive	Valve 1 and 2 error (no supply)
13	Valve1 active	Valve 1 and 2 error (no supply)
14	Valve2 active	Valve 1 and 2 error (no supply)
15	Valve1 and Valve2 active	Valve 1 and 2 error

Detected error situations are:

- ◆ No valve power supply available
- ◆ Short circuit in valve (cable)



*After power up, the valves are always inactive.*



*Field Bus safe state will deactivate the shut off valve.*



*The Shut-Off Valve Control adapter functions only with specially configured Bronkhorst instruments.*



*The analog interface is used for shut off valve operation. Analog setpoint and measure are disabled. Therefore only field bus or RS232 operation can be combined with the Shut-off Valve Control Adapter.*



*Do not electrically disconnect and reconnect an activated valve!  
For power consumption reduction, the valves are activated according to the holding voltage principle. Electrical disconnecting and reconnecting of an activated valve will not ensure re-activation of the valve.*

## 2.2 FLOW-BUS AND RS232



Manual 9.17.024 describes the FLOW-BUS interface  
Manual 9.17.027 describes the RS232 interface with FLOW-BUS protocol

	Data Type	Range	read/write	Secured	DDE	Proc/par
<b>IO Switch Status</b>	unsigned long	0 ... 4294967295	R/W	N	288	114/31

The least significant byte of the IO Switch Status Register is used for the Shut-off Valve control adapter.

## 2.3 MODBUS



Manual 9.17.035 describes the Modbus interface

MODBUS REGISTERS						
PARAMETER NAME	PARAMETER TYPE	ACCESS	PDU ADDRESS hex	REGISTER NUMBER		REMARK
				Hex	Dec	
IO Switch Status	Long Integer	RW	0xF2F8..0xF2F9	0xF2F9..0xF2FA	62201..62202	

## 2.4 PROFIBUS-DP



Manual 9.17.025 describes the PROFIBUS-DP interface

For PROFIBUS-DP, at least version V3.3 of the GSD file bht\_0586.gsd is needed.

FLOW-BUS parameter 'IO Switch Status' is ported to the following PROFIBUS-DP modules:

Module	Inputs	Outputs	In/Out	Identifier
General Purpose IO (read)	4 byte			0x42, 0x03, 0x72, 0x1F
General Purpose IO (write)		4 byte		0x82, 0x03, 0x72, 0x1F

## 2.5 DEVICENET



Manual 9.17.026 describes the DeviceNet interface

FLOW-BUS parameter 'IO Switch Status' is ported to the following DeviceNet object:

Analog actuator object	Attribute	Attribute name	Service code	Data type	Flowbus	Comment
0x32	0x64	General purpose I/O	0x0E, 0x10	INT	114, 31	General purpose I/O

## 2.6 ETHERCAT



Manual 9.17.063 describes the EtherCat interface

FLOW-BUS parameter 'IO Switch Status' is ported to the following EtherCAT object:

Index	Sub Index	Description	Data Type	Access	PDO mapping
0x2072	0x20	IO Switch Status	Unsigned32	RW	Possible

## 2.7 PROFINET



*Manual 9.17.095 describes the PROFINET interface*

GSDML file  $\geq$  V2.31

<b>Parameter name</b>	<b>Data Type</b>	
IO switch status (R)	Integer	32 bits
IO switch status (U)	Integer	32 bits

### 3 SERVICE

For current information on Bronkhorst and service addresses please visit our website:

 <http://www.bronkhorst.com>

Do you have any questions about our products? Our Sales Department will gladly assist you selecting the right product for your application. Contact sales by e-mail:

 [sales@bronkhorst.com](mailto:sales@bronkhorst.com)

For after-sales questions, our Customer Service Department is available with help and guidance. To contact CSD by e-mail:

 [support@bronkhorst.com](mailto:support@bronkhorst.com)

No matter the time zone, our experts within the Support Group are available to answer your request immediately or ensure appropriate further action. Our experts can be reached at:

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