

# **MASTERVOLT**

USERS MANUAL / GEBRUIKERSHANDLEIDING  
BETRIEBSANLEITUNG / MANUEL D'UTILISATION  
MANUAL DE UTILIZACION / INSTRUZIONI PER L'USO

## Digital Input

**MasterBus input device for electrical switches**



MASTERVOLT  
Snijdersbergweg 93,  
1105 AN Amsterdam  
The Netherlands  
Tel.: +31-20-3422100  
Fax.: +31-20-6971006  
www.Mastervolt.com

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## 1 GENERAL INFORMATION

### 1.1 USE OF THIS MANUAL

Copyright © 2009 Mastervolt. All rights reserved.  
Reproduction, transfer, distribution or storage of part or all of the contents in this document in any form without the prior written permission of Mastervolt is prohibited.

This manual serves as a guideline for the safe and effective operation, maintenance and possible correction of minor malfunctions of the *Digital Input*, part number 77030900.

Every person who works on or with the *Digital Input* must be completely familiar with the contents of this manual, and follow its instructions.

Keep this manual at a secure place!

The English version includes 12 pages.

### 1.2 GUARANTEE SPECIFICATIONS

Mastervolt guarantees that this unit has been built according to the legally applicable standards and specifications. Should work take place which is not in accordance with the guidelines, instructions and specifications contained in this users manual, then damage may occur and/or the unit may not fulfil its specifications. All of these matters may mean that the guarantee becomes invalid.

### 1.3 QUALITY

During their production and prior to their delivery, all of our units are exhaustively tested and inspected. The standard guarantee period is two years.

### 1.4 VALIDITY OF THIS MANUAL

All of the specifications, provisions and instructions contained in this manual apply solely to standard versions of the *Digital Input* delivered by Mastervolt.

### 1.5 LIABILITY

Mastervolt can accept no liability for:

- consequential damage due to use of the *Digital Input*;
- possible errors in the manuals and their results.



#### **CAREFUL!**

Never remove the type number sticker.

Important technical information required for service, maintenance & secondary delivery of parts can be derived from the type number sticker.

## 2 SAFETY GUIDELINES AND MEASURES

### 2.1 WARNINGS AND SYMBOLS

Safety instructions and warnings are marked in this manual by the following pictograms:



#### CAREFUL!

Special data, restrictions and rules with regard to preventing damage.



#### WARNING

A WARNING refers to possible injury to the user or significant material damage to the charger if the user does not (carefully) follow the procedures.



A procedure, circumstance, etc which deserves extra attention.

### 2.2 USE FOR INTENDED PURPOSE

- 1 The *Digital Input* is constructed as per the applicable safety-technical guidelines.
- 2 Use the *Digital Input* only:
  - in a technical correct condition;
  - in a closed, well-ventilated room, protected against rain, moist, dust and condensation;
  - following the instructions in the users manual.



#### WARNING

Never use the Digital Input in locations where there is danger of gas or dust explosion or potentially flammable products!

- 3 Use of the *Digital Input* other than mentioned in point 2 is not considered to be consistent with the intended purpose. Mastervolt is not liable for any damage resulting from the above.

### 2.3 ORGANIZATIONAL MEASURES

The user must always:

- have access to the user's manual;
- be familiar with the contents of this manual. This applies in particular to this chapter, Safety Guidelines and Measures.

### 2.4 MAINTENANCE AND REPAIR

- 1 If the electrical installation is switched off during maintenance and/or repair activities, it should be secured against unexpected and unintentional switching on:
  - switch off all charging systems;
  - switch off the connection with the batteries;
  - be sure that third parties cannot reverse the measures taken.
- 2 If maintenance and repairs are required, only use original spare parts.

### 2.5 GENERAL SAFETY AND INSTALLATION PRECAUTIONS

- Connection and protection must be done in accordance with local standards.
- Only allow changes in your electrical system to be carried out by qualified electricians.
- Check the wiring at least once a year. Defects such as loose connections, burned cables etc. must be corrected immediately.

### 3 OPERATION

#### 3.1 FUNCTIONAL OVERVIEW

The Digital Input is a MasterBus based input module. Electrical switches generate a MasterBus signal to control the connected MasterBus devices.

Input: push of a button.

Output: MasterBus signal to control the connected MasterBus devices.

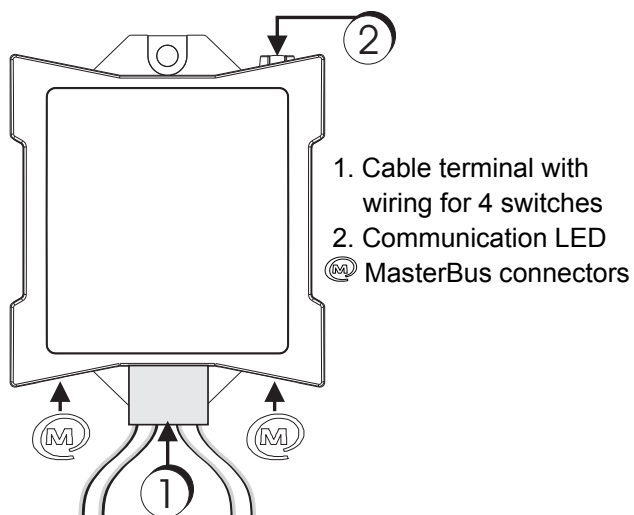
MasterBus menus:

- Monitoring menu;
- Configuration menu to enter names;
- Event menu to program controlling settings.

Read out device:

For installing and adjusting the Digital Input a monitoring device is necessary. For example:

- MasterView Easy;
- MasterAdjust PC software (via USB interface)



1. Cable terminal with wiring for 4 switches
  2. Communication LED
- MasterBus connectors

Figure 1: Digital Input functional overview

#### 3.2 MASTERBUS DISPLAYS

Mastervolt offers several ways of displaying your MasterBus data. Shown is the MasterView Easy panel.



Figure 2: MasterView Easy panel

Another way of displaying and setting values is the MasterAdjust software, shown for Digital Input application. See figure 3.

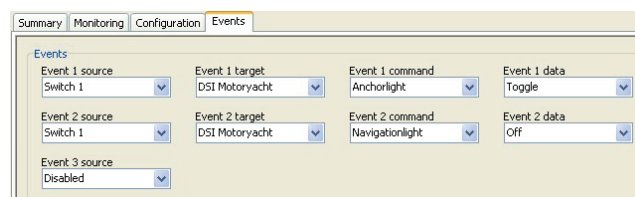


Figure 3: MasterAdjust software

## 4 MASTERBUS

### 4.1 WHAT IS MASTERBUS?



All devices that are suitable for MasterBus are marked by the MasterBus symbol.

MasterBus is a fully decentralized data network for communication between the different Mastervolt system devices. It is a CAN-bus based communication network which has proven itself as a reliable bus-system in automotive applications. MasterBus is used as power management system for all connected devices, such as the inverter, battery charger, generator and many more. This gives the possibility for communication between the connected devices, for instance to start the generator when the batteries are low.

MasterBus reduces complexity of electrical systems by using UTP patch cables. All system components are simply chained together. Therefore each device is equipped with two MasterBus data ports. When two or more devices are connected to each other through these data ports, they form a local data network, called the MasterBus. The results are a reduction of material costs as only a few electrical cables are needed and less installation time.

For central monitoring and control of the connected devices Mastervolt offers a wide range of panels which show full status information of your electrical system at a glance and a push of a button. Four different panels are available, from the MasterView Easy up to the full colour MasterView System panel.

All monitoring panels can be used for monitoring, control and configuration of all connected MasterBus equipment.

New devices can be added to the existing network in a very easy way by just extending the network. This gives the MasterBus network a high degree of flexibility for extended system configuration, not only today, but in the future as well!

Mastervolt also offers several interfaces, making even non-MasterBus devices suitable to operate in the MasterBus network. For direct communication between the MasterBus network and a product which is not from Mastervolt, the Modbus interface is recommended.



**CAUTION:** Never connect a non-MasterBus device to the MasterBus network directly! This will void warranty of all MasterBus devices connected.

### 4.2 EVENT BASED COMMANDS

With MasterBus each device can be programmed to initiate an action at another connected device. This is done by means of event based commands, see chapter 5 for explanation.

An event is a *condition* to be met at which you want *another device* to perform a *task*.

In chapter 5 the Events are explained.

## 5 MASTERBUS FUNCTIONS

### 5.1 MASTERBUS MENUS

Configuration to be done at the Digital Input:

Menu/Read	Description	Factory setting	Range
<b>Monitoring</b>			
State	State of the Digital Input device.	On	On, Disabled
Switch X	Switch X operation. X ranges 1-4.	On	On, Stand by
Disabled	Check box to disable/ enable the Digital Input.	Enabled	Enabled, Disabled
<b>Configuration</b>			
Language	Language setting of the Digital Input. NOTE: the language of the display may differ from this setting.	English	10 languages, see section 9.1.
Device name	Name of your Digital Input in the MasterBus network. If you have more than one Digital Input you should change names.	DSI Digital in	DSI + Any maximum 12 character name.
Events locked	Option to disable event configuration on the device. Operable by installer only (log in required).	Un-checked	Unchecked, Checked
Switch X	Name of switch X. X ranges 1-4. Naming the switches after their application is convenient, for instance "Anchor light" for the anchor light switch.	Switch X	Any maximum 16 character name.
<b>Events</b>			
Event 1 source	Switch to let a MasterBus device connected perform a task.	Disabled	Disabled, Switch 1-3 (1-4)
Event 1 target	MasterBus device to perform a task. A common target for the Digital Input is the Digital Switching Device.	-	System dependent
Event 1 command	Task data for event 1. Device part to perform the task, for instance Channel on the Digital Switching Device.	-	System dependent
Event 1 data	Task data for event 1. Action to be performed by the device part. See figure 4.	-	On, Off, Copy, Copy Invert, Toggle

### 5.2 MASTERBUS TASK DATA

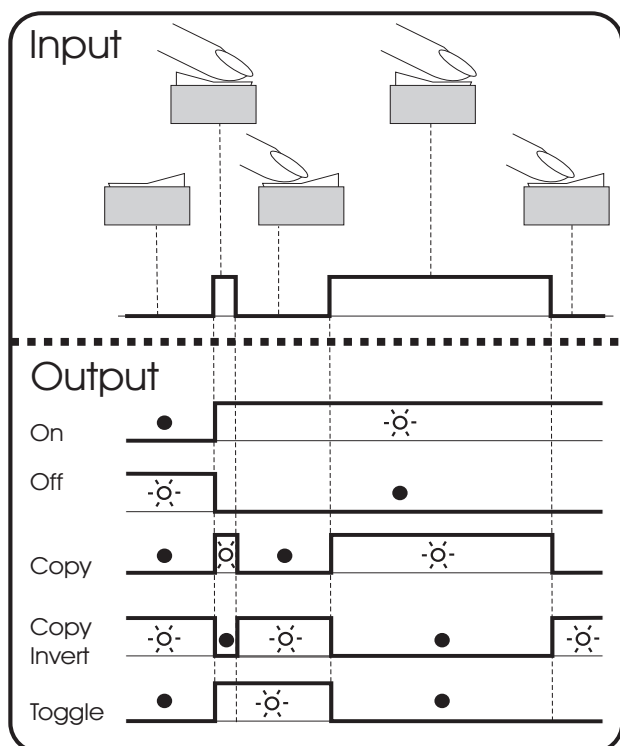


Figure 4: Task data

See figure 4.

- The **input** can be achieved with an on/off switch.
- **On** changes the status to On at the first input signal.
- **Off** changes the status to Off at the first input signal.
- **Copy** lets the status follow the input.
- **Copy Invert** lets the status follow the opposite of the input.
- **Toggle** changes the status at the first signal and changes back at the second signal. It is used in combination with a pulse switch. Toggle is used for dimming too by holding the pulse switch pressed for a longer time.

#### Event example: Light switch

The Digital Input can be used for switching connected MasterBus devices, for instance a light. Configuration here is done on the Digital Input. Switch 1 is the far left switch channel.

Event configuration example 1	
Event source	Switch 1
Event target	Reading light
Event command	State
Event data	Copy

For every Digital Input, more events can be configured.

## 6 INSTALLATION



### WARNING

During installation and commissioning of the Digital Input, the Safety Guidelines and Measures are applicable at all times. See chapter 2 of this manual.



### CAREFUL!

Wrong MasterBus connections may cause damage to the Digital Input and other equipment as well, which is not covered by warranty!

### 6.1 THINGS YOU NEED FOR INSTALLATION

Tools:

- 2 mm flat blade screwdriver for connecting the switch wires.

A complete set of spanners, pliers and wrenches may be helpful during the installation of the *Digital Input*.



### CAREFUL!

Use isolated tools!

Materials:

- Digital Input
- Cable plug with 8 cables
- Up to 4 electrical switches (not included)
- MasterBus cable (not included)
- Terminator for MasterBus
- Installation manual Digital Input

### 6.2 INSTALLATION STEP BY STEP

1. Make sure the cable plug has been inserted well into the socket.
2. Connect the simple electrical switches to the cables. See figure 5: The four switch positions are shown.
3. Connect the Digital Input to the MasterBus network. Insert the MasterBus cables into the sockets shown.



Do not forget to install the MasterBus terminator if necessary!

4. Mount the casing to the wall or to a DIN rail.

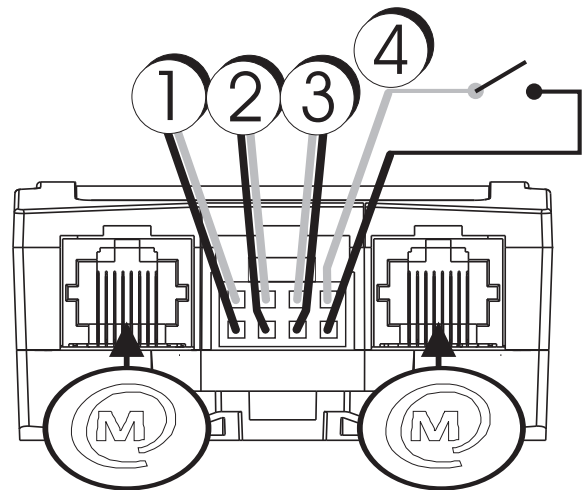


Figure 5: Connections

### 6.3 COMMISSIONING

Connect the electrical power, then configure the switches (see chapter 5).



## 7 ORDERING INFORMATION

Part number	Description
77010300	MasterView Easy
77030100	MasterBus USB interface, required as interface between your PC and the MasterBus network
77040000	MasterBus terminator for the MasterBus network (standard included)
77040020	MasterBus connection cable, 0,2m / 0.6ft
77040050	MasterBus connection cable, 0,5m / 1.6ft
77040100	MasterBus connection cable, 1,0m / 3.3ft
77040300	MasterBus connection cable, 3,0m / 10ft
77040600	MasterBus connection cable, 6,0m / 20ft
77041000	MasterBus connection cable, 10m / 33ft
77041500	MasterBus connection cable, 15m / 49ft
77042500	MasterBus connection cable, 25m / 82ft
77050000	Complete set to assemble MasterBus cables. Delivery includes: 100m / 330ft UTP cable, 50 pcs. modular jacks and crimping tool
77050100	100m / 330ft MasterBus cable
77050200	50 pcs. MasterBus connectors
77030900	Digital Input
77031500	Digital DC 10x10A

Mastervolt offers a wide range of products for your electrical installation, including AGM batteries, GEL batteries, Digital Input kits, battery switches, battery cables, battery terminals and Mastervision switchboards. See our website [www.mastervolt.com](http://www.mastervolt.com) for an extensive overview of all our products and free to download software for remote monitoring.

## 8 TROUBLE SHOOTING

Please contact your local Mastervolt Service Centre if you cannot correct a problem with the aid of the malfunction table below. See [www.Mastervolt.com](http://www.Mastervolt.com) for an extended list of Mastervolt Service Centres.

Failure	Possible cause	What to do
No communication.	Error in the wiring.	Check the MasterBus cables.
	No terminating device placed at the ends of the network.	MasterBus needs a terminating device on both ends of the network. Check if installed.
	MasterBus network is configured as a ring network.	Ring networks are not allowed. Check the network connections.
Wrong language is displayed.	T-connections in the MasterBus network.	Check if T-connections are made in the network. T-connections are not allowed.
	Wrong setting of the language at the Digital Input.	Adjust the language setting. See chapter 5, Configuration General.
Event configuration is not possible, the menus are still readable but grey.	Wrong setting of the language at displaying device.	Every separately connected device can have its own language setting. See the user's manual of the connected device.
	The installer has locked the events to prevent unwanted configuration changes.	If desirable, ask the installer to unlock the event configuration (temporarily).

## 9 SPECIFICATIONS

### 9.1 TECHNICAL SPECIFICATIONS

Specifications	
Model	Digital Input
Article number	77030900
Function	MasterBus input device with a wire terminal for electrical switches
Manufacturer	Mastervolt Amsterdam, the Netherlands
Configuration and monitoring	By means of an external display or PC screen
Available languages	English, Nederlands, Deutsch, Francais, Castellano, Italiano, Norsk, Svenska, Suomi, Dansk
Number of configurable events	63
Number of products that can control the Digital Input	Unlimited
MasterBus powering capability	No
Communication isolation	Galvanic
Power consumption in sleep modus	0.21 mA
IP factor	21
Weight	125 g including cable terminal

### 9.2 DIMENSIONS

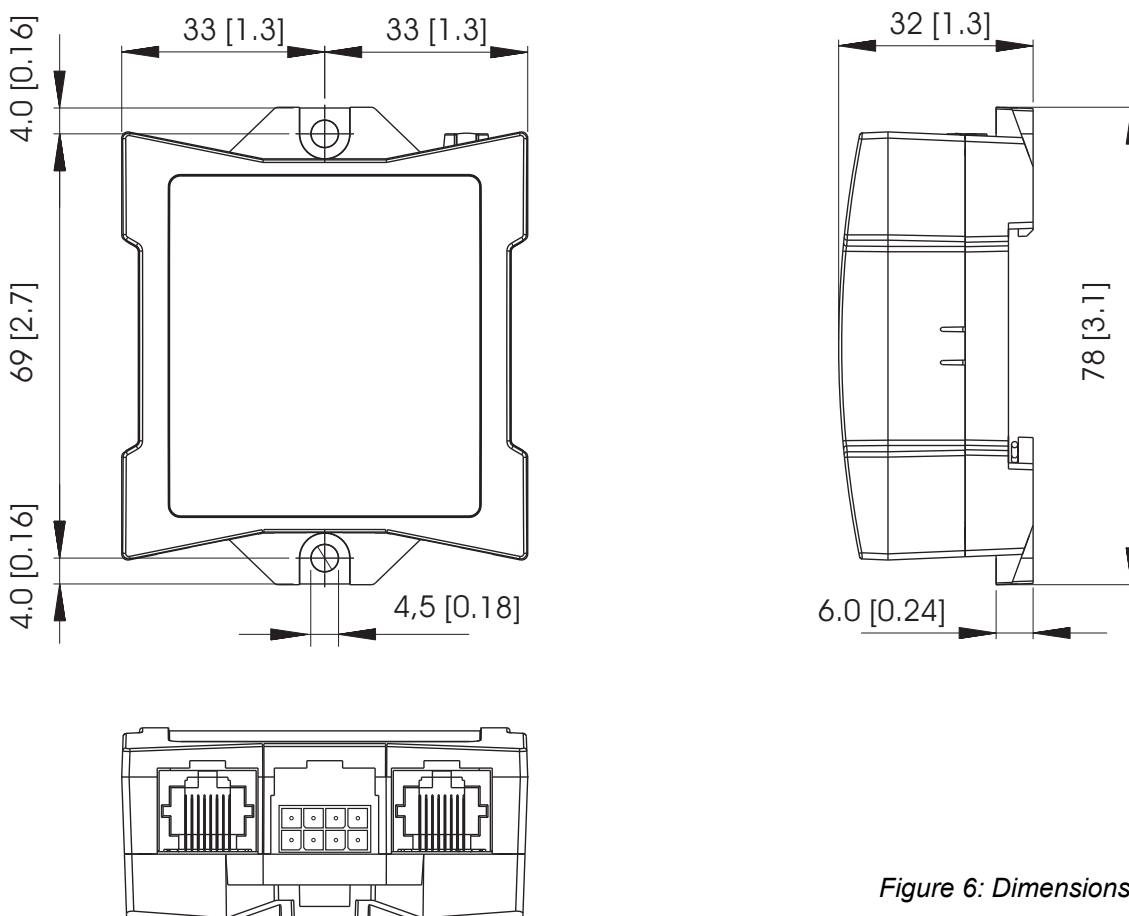


Figure 6: Dimensions in mm (inches)

**10 EC DECLARATION OF CONFORMITY**

Manufacturer Mastervolt  
Address Snijdersbergweg 93  
1105 AN Amsterdam  
The Netherlands



Herewith declares that:

Product:

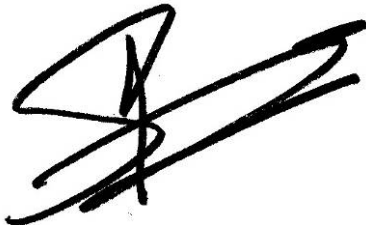
77030900 Digital Input

Is in conformity with the provision of the EC EMC directive 89/336/EEC and amendments 92/31/EEC, 93/68/EEC.

The following harmonised standards have been applied:

Generic emission standard: EN 50081-1:1992  
Generic Immunity standard: EN 50082-1:1997  
Low voltage directive: 2006/95/EC, with standard:  
Low voltage standard: EN 60950: 2000

Amsterdam,



P.F. Kenninck,  
General Manager MASTERVOLT



Snijdersbergweg 93, 1105 AN Amsterdam, The Netherlands  
Tel : + 31-20-3422100  
Fax : + 31-20-6971006  
Email : [info@Mastervolt.com](mailto:info@Mastervolt.com)