MCC 152
Voltage Output and DIO HAT Device

Note The guidelines in this document are specific to the MCC 152.

Read this document and the documents listed in the additional resources section about installation, configuration, and operation of this equipment before you install, configure, operate, or maintain this product. Users are required to familiarize themselves with installation and wiring instructions in addition to requirements of all applicable codes, laws, and standards.

Icons

Notice Take precautions to avoid data loss, loss of signal integrity, degradation of performance, or damage to the device.

Caution Take precautions to avoid injury. Consult the device documentation for cautionary statements when you see this icon printed on the device.

Safety Guidelines

Caution Observe all instructions and cautions in the user documentation. Using the device in the manner not specified can damage the device and compromise the built-in safety protection.

Attention Suivez toutes les instructions et respectez toutes les mises en garde de la documentation utilisateur. L'utilisation d'un modèle de toute autre façon que celle spécifiée risque de l'endommager et de compromettre la protection de sécurité intégrée. Renvoyez les modèles endommagés à NI pour réparation.

Safety Voltages

The DIO supply voltage (VIO) is set with jumper W3 for either 5 V (default) or 3.3 V.

Connect only voltages that are within these limits.

5 V mode .....5.5 V maximum, 0 V minimum
3.3 V mode .....3.8 V maximum, 0 V minimum†
Output current:.....10 mA per digital output, 80 mA for all 8 outputs, regardless of the mode

† When VIO is 3.3 V the input will tolerate voltages up to 6.5V, but the voltage must be current-limited or it will change the VIO voltage due to current flowing into the into the MCC 152. An external current limiting resistor of 700 Ω or larger is recommended on each input that is higher than 3.3V when the W3 jumper is in the 3.3V position.

Caution Do *not* connect the MCC 152 to signals or use for measurements within Measurement Categories II, III, or IV.

Caution Ne connectez pas le MCC 152 à des signaux et ne l'utilisez pas pour effectuer des mesures dans les catégories de mesure II, III ou IV.

Measurement Category I is for measurements performed on circuits not directly connected to the electrical distribution system referred to as MAINS voltage. MAINS is a hazardous live electrical supply system that powers equipment. This category is for measurements of voltages from specially protected secondary circuits. Such voltage measurements include signal levels, special equipment, limited-energy parts of equipment, circuits powered by regulated low-voltage sources, and electronics.

Note Measurement Categories CAT I and CAT O are equivalent. These test and measurement circuits are not intended for direct connection to the MAINS building installations of Measurement Categories CAT II, CAT III, or CAT IV.

Electrical

Analog output range.....0 V to 5.0 V
Output current: .....5 mA per analog output, 10 mA for both outputs

Safety Compliance Standards

This product meets the requirements of the following standards of safety for electrical equipment for measurement, control, and laboratory use:

- EN 61010-1 (IEC61010-1)
- UL 61010-1
- CSA C22.2 No. 61010-1

Note For UL and other safety certifications, refer to the product label or the *Product Certifications and Declarations* section.

Electromagnetic and Radio Equipment Compatibility Guidelines

This device was tested and complies with the regulatory requirements and limits for electromagnetic compatibility (EMC) as stated in the device specifications. These requirements and limits provide reasonable protection against harmful interference when the device is operated in its intended operational electromagnetic environment.

This device is intended for use in commercial and industrial locations. However, harmful interference may occur in some installations, when the product is connected to a peripheral device or test object, or if the product is used in residential or commercial areas. To minimize interference with radio and television reception and prevent unacceptable performance degradation, install and use this product in strict accordance with the instructions in the product documentation.

Furthermore, any modifications to the device not expressly approved by Measurement Computing could void your authority to operate it under your local regulatory rules.

EMC Notices

Notice For EMC declarations and certifications, and additional information, refer to the Declaration of Conformity (DoC) on our website at *mccdaq.com//Calibration-Certificates*.

Notice Changes or modifications to the device not expressly approved by MCC could void your authority to operate the device under your local regulatory rules.

Notice The performance of this product can be disrupted if subjected to Electrostatic Discharge (ESD) during operation. To prevent damage, industry-standard ESD prevention measures must be employed during installation, maintenance, and operation.

Notice Shielded cables are required in order to meet the stated EMC specifications.

Electromagnetic Compatibility Standards

This product meets the requirements of the following EMC standards for electrical equipment for measurement, control, and laboratory use:

- EN 61326-1 (IEC 61326-1): Class A emissions; Basic immunity
- EN 55011 (CISPR 11): Group 1, Class A emissions

Environmental Guidelines

Notice This device is not intended for use in outdoor or hazardous locations.

Environmental Characteristics

Temperature
- Operating ..... 0 °C to 55 °C
- Storage ..... –40 °C to 85 °C

Humidity ..... 0% to 90%, noncondensing (Tested in accordance with IEC 60068-2-56)
Pollution Degree 2
Maximum Altitude ..... 2,000 m
Indoor use only.

Environmental Management

MCC is committed to designing and manufacturing products in an environmentally responsible manner. MCC recognizes that eliminating certain hazardous substances from our products is beneficial to the environment and to MCC customers.

Waste Electrical and Electronic Equipment (WEEE)

EU Customers At the end of the device life cycle, all MCC devices must be disposed of according to local laws and regulations.

电子信息产品污染控制管理办法 （中国 RoHS）

中国客户 Measurement Computing 符合中国电子信息产品中限制使用某些有害物质指令（RoHS）。关于 Measurement Computing 中国 RoHS 合规性信息，请登录 *ni.com/environment/rohs_china*。（For information about China RoHS compliance, go to *ni.com/environment/rohs_china*）

Power Requirements

The MCC 152 is powered by the Raspberry Pi.

Supply current, 5 V supply
- Typical, 5V DIO selection .....15 mA
- Maximum, 5V DIO selection .....35 mA† ‡
- Typical, 3.3V DIO selection .....10 mA
- Maximum, 3.3V DIO selection .....12 mA†

Supply current, 3.3 V supply *
- Typical, 5V DIO selection .....0.1 mA
- Maximum, 5V DIO selection .....6 mA
- Typical, 3.3V DIO selection .....3.5 mA
- Maximum, 3.3V DIO selection .....11 mA†

† This specification does not include user loading on analog outputs.

‡ This specification does not include user loading on digital outputs or the VIO terminal.

* The power consumed by all DAQ HATs must be within the capacity of the Raspberry Pi power supply. Extra care must be taken with sourcing 3.3V loads since they are supplied by the regulator on the Raspberry Pi; We recommend using the 5V DIO selection when sourcing large load currents such as LEDs.

Physical Characteristics

Dimensions (L × W × H) .....65 × 56.5 × 12 mm (2.56 × 2.22 × 0.47 in.)
Weight .....22.7 g (0.80 oz)

Export Compliance

This device is subject to control under the U.S. Export Administration Regulations (15 CFR Part 730 et. seq.) administered by the U.S. Department of Commerce's Bureau of industry and Security (BIS) (*www.bis.doc.gov*) and other applicable U.S. export controls laws and sanctions regulations. This device may also be subject to additional license requirements of other countries' regulations.

Additionally, this device may also require export licensing before being returned to MCC. The issuance of a Return Material Authorization (RMA) # by MCC does not constitute export authorization. The user must comply with all applicable export laws prior to exporting or re-exporting this device. See *www.mccdaq.com/legal* for more information and to request relevant import classification codes (such as HTS), export classification codes (such as ECCN), and other import/export data.

CE Compliance CE

This product meets the essential requirements of applicable European Directives as follows:

- 2014/30/EU; Electromagnetic Compatibility Directive (EMC)

Product Certifications and Declarations

Hereby, Measurement Computing declares that the MCC 152 is in compliance with the essential requirements and other relevant provisions of Directive 2014/30/EU. Refer to the product Declaration of Conformity (DoC) our website at *mccdaq.com//Calibration-Certificates* for additional regulatory compliance information.

Additional Resources

Refer to *mccdaq.github.io/daqhats/index.html* for more information about your device, including specifications, signal pinouts, and instructions for connecting, installing, and configuring your device.

Worldwide Support and Services

The MCC website is your complete resource for technical support. At *mccdaq.com/support*, you have access from application development self-help resources to email and phone assistance from MCC Application Engineers.

Measurement Computing corporate headquarters is located at 10 Commerce Way, Norton, Massachusetts, 508-946-5100. Measurement Computing also has offices located in China and Germany. For support in the United States, submit a Tech Support Form at *mccdaq.com/support/support_form* or dial 1 508 946 5100. For international customers, visit the International Distributors section of *mccdaq.com/international* for your local distributor contact information.