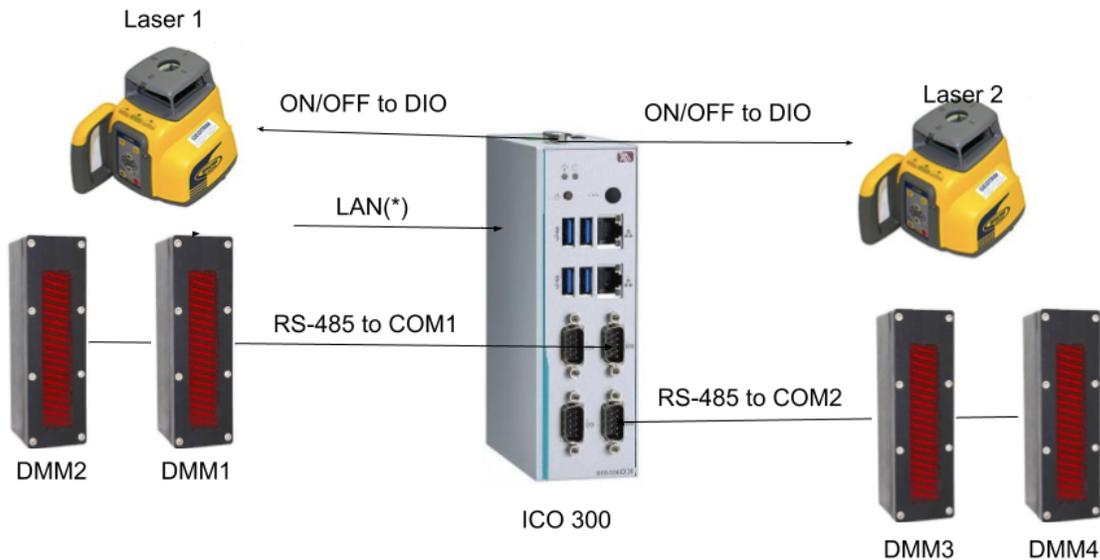


Dimense system Quick Start Guide v. 1.0

I. Introduction

The logical structure and connections of the Dimense system including 4 DMMs and 2 lasers are shown in Figure 1. This is only an example, the number of DMMs and lasers can be smaller or larger. The system is operated from a remote computer through the LAN connection using the IP address of the ICO 300 and TCP/IP ports 5005, 5006 and 8080. Details of the communication protocols, commands, data format and operating sequence are given below. **It is worth emphasizing, that the system itself does not initiate measurements nor save or process the data coming from the DMMs, therefore, these operations must be performed by the user in the remote computer used to access the ICO 300.** See chapter III for details of the preferred sequence of operation of the system.



(*) TCP/IP ports 5005 and 5006 for data, and 80 for REST commands/status

Figure 1. Logical structure of the system.

II. Overview of the system operation via LAN

ICO 300 acquires its IP address from the LAN using DHCP. User operates the system using REST commands directed to TCP/IP port 8080. User receives data from the system from two TCP/IP ports, namely, ports 5005 and 5006. Port 5005 outputs data from DMMs 1 and 2, and port 5006 from DMMs 3 and 4. Every 1/100th of a second port 5005 outputs one line of data from DMM1 and one line of data from DMM2 - i.e. two lines every 0.01 s. Similarly, every 1/100th of a second port 5006 outputs one line of data from DMM3 and one line of data from DMM4 - i.e. two lines every 0.01 s. The format of each ASCII encoded data line follows the comma-separated-values format with the following fields:

<DMM number>,<abs. vertical position>, <tilt 1>, <tilt 2>, <acceleration 1>, <acceleration 2><LF>

where <LF> equals the line feed character '\n'. Vertical position is given in millimeters, tilts in degrees and accelerations in m/s².

For example, a data line might look like this: **2,83.5,0.12,0.01, 0.001,-0.003**

A quick way to access the data available from ports 5005 and 5006 from a remote computer is to use the netcat utility found in most UNIX/LINUX systems. E.g. command

nc <IP address of ICO 300> 5005

will print the data stream coming from DMMs 1 and 2 to the terminal.

User controls the state of the system using REST commands sent port 8080. Three main commands are **on**, **off** and **status**, whose uses are explained in Table 1 (<IP> stands for the IP address of the ICO 300).

Table 1. REST commands

Command	URL	Purpose	Output/return string
on	<i>http://<IP>:8080/dmm/on</i>	Turns lasers and DMMs on	lasers and dmms turned on
off	<i>http://<IP>:8080/dmm/off</i>	Turns lasers and DMMs off	lasers and dmms turned off
status	<i>http://<IP>:8080/dmm/status</i>	Queries the current system status	lasers and dmms on/off (depending on current state)

These commands can be easily executed either by using the curl program or web browser. E.g. typing in UNIX/LINUX terminal

curl http://<IP address of ICO 300>:8080/dmm/on

Would turn the system on. Alternatively, the use of a web browser is shown in Figure 2. (localhost used as the IP address).



Figure 2. Use of web browser to execute REST commands on the ICO 300.

III. Preferred sequence of operation of the system

The sequence of using the Dimense system is as follows:

1. Start the system using REST command *http://<IP>:8080/dmm/on*
2. Open and access data from TCP/IP ports 5005 and 5006 using any method/programming language - e.g. the netcat program
3. Save, process, use etc. the data from DMMs 1 - 4 as needed.
4. Close TCP/IP ports 5005 and 5006
5. Switch off the system (i.e. power down DMMs and lasers, not the ICO 300 itself) by using REST command *http://<IP>:8080/dmm/off*

IV. Contacts for further assistance

DIMENSE OY

Paulaharjuntie 22

90530 Oulu

+358 (0)40 767 1344

info@dimense.fi