# DeviceNet Conformance Test Result

| | | | |
|---|---|---|---|
| **Test Date:** | 07 June 2004 | **Composite Test Revision:** | **18** |
| | | **Test Suite:** | M002 |

**ODVA File Number:** 10105

**Vendor ID:** 706
**Vendor Name:** Bronkhorst High-Tech B.V.
**Vendor Address:** Nijverheidsstraat 1a
NL-7261 AK Ruurlo
The Netherlands

| | |
|---|---|
| **Product Name(s)**<br>**(Device actually tested)** | Bronkhorst meter/controller |
| **Product Code(s)** | 7 |
| **Product Revision** | 1.001 |
| **Device Type Code** | 26 |
| **Device Profile Name** | Mass Flow Controller |
| **Electronic Data Sheet Revision** | 1.2 |
| **Comments:** | Passed DeviceNet conformance composite 18 – See advisories |

**Conformance Advisories:**
1- Peak inrush current is 19A at 25VDC.  See accompanying file "INRUSH.DOC"

# Protocol Conformance Test Revision A-17:

| Protocol Test Software Revision | | A-17 |
|---|---|---|
| SOC File Name | Mbc.stc | **Pass** |
| Protocol Test Log File | Mbc_500K.log | |
| Minimum wait for Explicit | 0 ms | |

# 1  Physical Layer Test Revision B3:

| Physical Layer Test Plan Revision | B3 |
|---|---|

| 1) Connector check: | Pass |
|---|---|
| 2) Transmit level check: | Pass |

**Transmitter Requirements**

| measured value [V] | | | | Pass/Fail | Comments |
|---|---|---|---|---|---|
| Tests | | @25V | @11V | | |
| Dominant level on CAN_H | Max | 4.06 | 4.06 | 3.0V<Pass<5.1V 3.0V<Warning<3.5V 4.5V<Warning<5.1V | Pass |
| | Min | 3.86 | 3.88 | | |
| | Ave. | | | | |
| Dominant level on CAN_L | Max | 1.52 | 1.54 | 0.75V<Pass<2.85V 0.75V<Warning<1.25V 2.25V<Warning<2.85V | Pass |
| | Min | 1.42 | 1.44 | | |
| | Ave. | | | | |
| Recessive level on CAN_H | Max | 2.98 | 3.10 | 2.25V<Pass<3.6V 2.25V<Warning<2.7V 3.1V<Warning<3.6V | Pass |
| | Min | 2.66 | 2.66 | | |
| | Ave. | | | | |
| Recessive level on CAN_L | Max | 2.88 | 3.04 | 2.25V<Pass<3.6V 2.25V<Warning<2.7V 3.1V<Warning<3.6V | Pass |
| | Min | 2.60 | 2.60 | | |
| | Ave. | | | | |

| File Name (Dominant) | PHY25VDC.CSV |
|---|---|
| File Name (Recessive) | PHY11VDC.CSV |

**Receiver Requirements**

| measured value [V] | | | | Pass/Fail | Comments |
|---|---|---|---|---|---|
| Tests | | @25V | @11V | | |
| Dominant level Differential (CAN_H – CAN_L) | Max | 2.52 | 2.52 | 1.5V<Pass<3.0V | Pass |
| | Min | | | | |
| | Ave. | | | | |
| Recessive level Differential (CAN_H – CAN_L) | Max | +40mv | +40mv | -500mV<Pass<+50mV | Pass |
| | Min | 0 mv | 0 mv | | |
| | Ave. | | | | |

**3) Current Drain check:**

| | |
|---|---|
| Average current @ 25v | 0.129 A |
| Average current @ 11v | 0.142 A |
| Maximum current value specified in SOC | 0.250 A |

## 2 Physical Layer Test Revision B4 (Advisory)

### 1) Connector check

| | |
|---|---|
| The connector used matches that defined in the SOC. | **Pass** |
| The presence of gold coloring on the pins of the connector. | **Pass** |
| The DeviceNet connector is male-type connector. | **Pass** |

### 2) Indicator check

| | |
|---|---|
| LEDs supported by this product : | **None** |

### 2-1) Module status LED operation

| | |
|---|---|
| The product contains a red/green indicator for the module status. | **N/A** |
| Indicator operation (0.25 sec GREEN, then 0.25 sec RED at a self-test). | **N/A** |
| Indicator operation (GREEN flashing or GREEN ON after a self-test). | **N/A** |
| Detection of MAC ID switch change by flashing RED | **N/A** |
| Detection of Baud Rate switch change by flashing RED | **N/A** |

### 2-2) Network status LED operation

| | |
|---|---|
| The product contains a red/green indicator for the network status. | **N/A** |
| Indicator operation (0.25 sec GREEN, then 0.25 sec RED at a self-test). | **N/A** |
| Indicator operation (LED OFF after a self-test when a DUT is a solitary node). | **N/A** |
| Indicator operation (GREEN flashing after a self-test when a DUT is an occupied node). | **N/A** |
| Detection of a bus-off condition by CAN_H to CAN_L short. | **N/A** |
| Detection of a bus-off condition by CAN_H, CAN_L to +5v, 0V | **N/A** |
| Detection of an invalid MAC ID at power up by solid RED | **N/A** |
| Detection of an invalid Baud Rate at power up by solid RED | **N/A** |
| Detection of MAC ID conflict by solid RED | **N/A** |

### 3) MAC ID Switch

Switch used for this product :　　　　　None

| | |
|---|---|
| The switch is labeled in decimal format. | **N/A** |
| The MSD switch is set to the left or top of the product. | **N/A** |

| MAC ID set by DIP Switch | MAC ID set by Rotary Switch | Actual MAC ID on a network | Pass/Fail |
|---|---|---|---|
| 0 | 0 | **N/A** | |
| 01H | 1 | **N/A** | |
| 02H | 11 | **N/A** | |
| 04H | 22 | **N/A** | |
| 08H | 33 | **N/A** | |
| 10H | 44 | **N/A** | |
| 20H | 55 | **N/A** | |
| 3FH | 63 | **N/A** | |
| > 3FH | > 63 | | |

### 5) Power
**5-1) Physical Layer Power Sense Verification:**　　N/A
**5-2) Minimum Operating Voltage:**　　<11.0 V

### 5-4) Inrush current

Peak inrush current pulse / duration to 3A @ 11v　　7.5 A / 30 us

Peak inrush current pulse / duration to 3A @ 25v　　19 A / 40 us

| | |
|---|---|
| **File Name (Inrush 11VDC)** | |
| **File Name (Inrush 17VDC)** | |
| **File Name (Inrush 25VDC)** | INR25VDC.CSV |

## 6) CAN timing

### 6-1) Bit Timing Measurement

Bit time @ 125kbps:                    8.00 µs

Bit time @ 250kbps:                    4.00 µs

Bit time @ 500kbps:                    2.00 µs

### 6-2) ACK delay time

ACK delay time @ 125kbps          -280 ns to +120 ns

ACK delay time @ 250kbps          -40 ns to +140 ns

ACK delay time @ 500kbps          -10 ns to +80 ns

## 7) Mis-wiring

Initial Rin, Cin                         38.0k , 4 pf

Final Rin, Cin                           38.0k , 4 pf

Operation                                Pass

# 3  Interoperability Test Revision C6

**Master devices used for the interoperability test**

Primary master devices:   <u>Allen-Bradley 1769-DNB (Revision 3.010)</u>

Alternate master devices:  NA

**Manager tools used for the interoperability test**

Primary Manager tool: Rockwell Automation <u>RSNetWorx for DeviceNet (Revision 3.00.02)</u>

Alternate Manager tool: <u>NA</u>

**Test used the primary master devices**

### 1-1) Power Supply Sequence Test for a slave with non-isolated physical layer

| No. | Power supply turn ON sequence | | | Pass/Fail | Comments |
|-----|---------|---------|---------|-----------|----------|
|     | 1 | 2 | 3 | | |
| 1 | Network | Master | Aux. Pwd Dev | Pass | |
| 2 | Network | Aux. Pwd Dev | Master | Pass | |
| 3 | Master | Network | Aux. Pwd Dev | Pass | |
| 4 | Aux. Pwd Dev | Network | Master | Pass | |
| 5 | Master | Aux. Pwd Dev | Network | Pass | |

### 1-1) Power Supply Sequence Test for a slave with isolated physical layer

| No. | Power supply turn ON sequence | | | | Pass/Fail | Comments |
|-----|---------|---------|---------|---------|-----------|----------|
|     | 1 | 2 | 3 | 4 | | |
| 1 | Network | Master | DUT | Aux. Pwr | | |
| 2 | Network | DUT | Aux. Pwr | Master | | |
| 3 | Network | DUT | Master | Aux. Pwr | | |
| 4 | Network | Aux. Pwr | DUT | Master | | |
| 5 | DUT | Master | Network | Aux. Pwr | | |
| 6 | DUT | Aux. Pwr | Network | Master | | |
| 7 | DUT | Master | Aux. Pwr | Network | | |

### 1-2) Power On/Off Test

| No. | Test | Pass/Fail | Comments |
|-----|------|-----------|----------|
| 1 | Master Power On/Off (5 times) | Pass | |
| 2 | Network Power On/Off (5 times) | Pass | |
| 3 | DUT Power On/Off (5 times) | N/A | |

### 1-3) Device Disconnect-Reconnect Test

| No. | Test | Pass/Fail | Comments |
|-----|------|-----------|----------|
| 1 | Master Disconnect-Reconnect Test with time out (5 times) | Pass | |
| 2 | Master Disconnect-Reconnect Test without time out (5 times) | Pass | |
| 3 | DUT Disconnect-Reconnect Test (5 times) | Pass | |

**1-4) Network Aerobic Test**

Pass

**Note:**
    1)   Interscan delay time:    2.0 ms

# 4  EDS file Test ( Advisory test items)

| | | |
|---|---|---|
| **EDS Checker Software** | Version  2.18 | |
| **EDS File:** | bht_dmfc.eds | |
| **EDS File Revision** | 1.0 | |
| **Log File:** | bht_dmfc.ecf | Pass |

**3-1) Test used the Primary Manager Tool**

| No. | Test | Pass/Fail | Comments |
|---|---|---|---|
| 1 | Install the EDS of the DUT into the Manager | Pass | |
| 2 | Use the Manager to configure the DUT using EDS file data. | Pass | |
| 3 | Use the Manager to upload Parameters from DUT. | Pass | |
| 4 | Use the Manager to modify Parameters for the DUT. | Pass | |

**3-2) Test used the Alternate Manager Tool**

| No. | Test | Pass/Fail | Comments |
|---|---|---|---|
| 1 | Install the EDS of the DUT into the Manager | | |
| 2 | Use the Manager to configure the DUT using EDS file data. | | |
| 3 | Use the Manager to upload Parameters from DUT. | | |
| 4 | Use the Manager to modify Parameters for the DUT. | | |

**TESTER IDENTIFICATION**

Tested By      *William Henry*

Date          07 June 2004