

# HMS Anybus Communicator CAN - EtherCAT

## Test report



Version	Date	Change	Author
0.1	13-Mar-2014	Initial creation	Anthony van Lent

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## 1. Introduction

This Test Report provides a summary of the results of tests performed as outlined in this document for the Anybus Communicator CAN - EtherCAT.

### 1.1 References

Ref	Description
[1]	Sysmac Studio Version 1 Operation Manual, Version 1, <a href="#">W504-E1-02+SysmacStudio+OperManual.pdf</a>
[2]	User Manual Anybus® Communicator CAN EtherCAT Doc.Id. HMSI-168-58, Rev. 1.11, 472-2561-Anybus_Communicator_CAN_EtherCAT_user_manual.pdf
[3]	Anybus Communicator CAN – EtherCAT INSTALLATION SHEET SP1306 - rev 2.00 - Apr 2012 - AB7311, rev 2.00, 472-1927-SP1306_ABC_CAN_ECT_2_00.pdf

### 1.2 Abbreviations and acronyms

Abbreviation(s)	Description
ESI	EtherCAT Slave Information

## 2. Test result summary

Test case	Result
T1: Device Description File	PASSED
T2: Data Exchange	
Node address test	PASSED
Link test	PASSED
Power test	PASSED
Pdo map	PASSED
T3: Basic Operation	PASSED
T4: Duration	Not tested

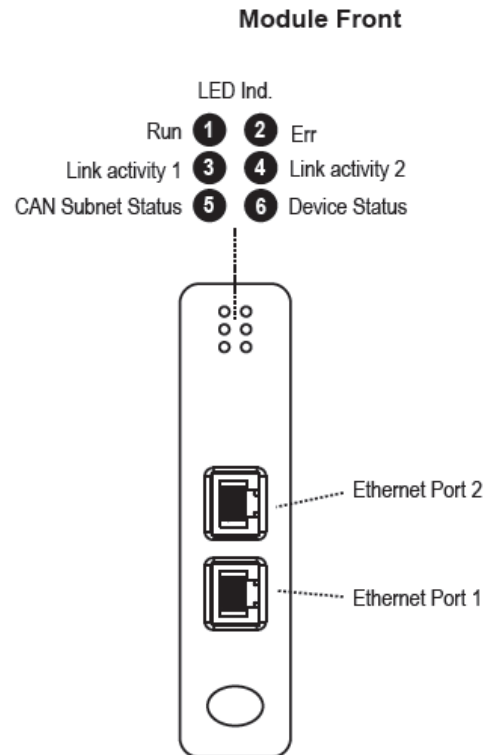
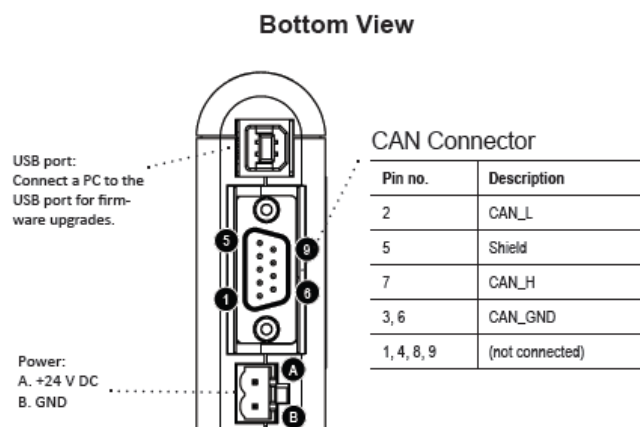
## 3. Test Preparation

### 3.1 Test equipment

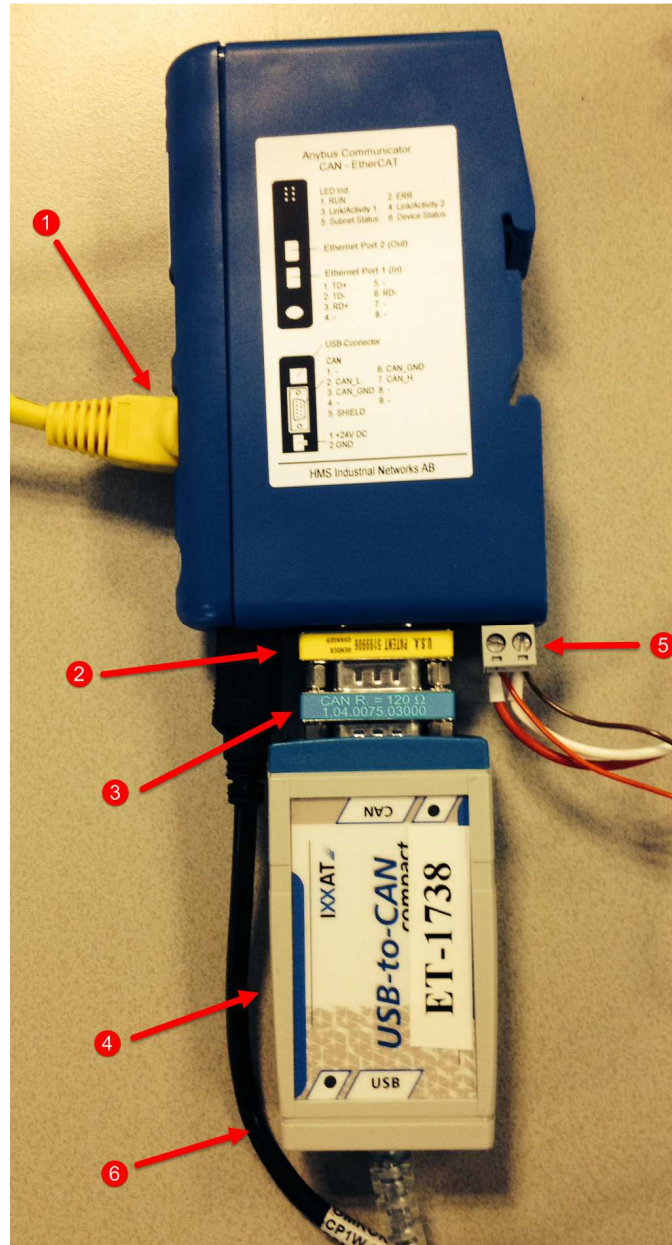
Description	Version	Remarks
ESI file checker	1.0.9.1	
ECT++	-	
Sysmac Studio	1.09	
NJ501-1500	1.08	
NJ-PD3001	-	
ABC_CAN_ETHERCAT_V_1_08_Omron 20140311_Ssv1.09_NJv1.08.xml	N.a.	
Anybus Communicator CAN - EtherCAT	FW 1.8.2, Ser. No. A01E4D9B	Name:Anybus Communicator CAN Man: 0000001b ID: 0000001d Rev: 00010008 ESC Type:00 (Unknown) Rev:00 Build:0000 Activeports:1.0.0.0 Alias address: 001f SM0 A:1c00 L: 192 F:00010026 Type:1 SM1 A:1e00 L: 192 F:00000022 Type:2 FMMUfunc 0:1 1:0 2:0 3:0 MBX length wr: 192 rd: 192 MBX protocols : 04 CoE details:13 FoE details:00 EoE details:00 SoE details:00 PDO mapping according to CoE :
Anybus Configuration Manager – Communicator CAN	1.5.1.4	Anybus Communicator CAN-9291-ACM Communicator CAN

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		1.5.1.4.zip
CAN MiniMonitor V3	3, 5, 1, 3826	
IXXAT CAN-to-USB compact dongle		
SUB-D9 gender changer		
SUB-D9 Connector with CAN Termination		

**3.2 Third party device****3.2.1 Wiring****Figure 1. Wiring diagram Anybus Communicator CAN - EtherCAT (Module Front).****Figure 2. Wiring diagram Anybus Communicator CAN - EtherCAT (Bottom View).**

For more details see [3].

**CONFIDENTIAL B****3.2.2 Installation****Figure 3. Test setup.**

1. Connect power supply to the Anybus Communicator CAN - EtherCAT as indicated in Figure 2 and ⑤ in Figure 3
2. Connect Ethernet cable to 'Port 2 EtherCAT' of the NJ501-1500 and 'Ethernet Port 1 (In)' of the Anybus Communicator CAN - EtherCAT (① in Figure 3)
3. Connect USB-to-CAN dongle (④ in Figure 3) together with gender changer (② in Figure 3) and CAN terminator (③ in Figure 3) to Anybus Communicator CAN - EtherCAT CAN connector
4. Connect USB cable (⑥ in Figure 3) to Anybus Communicator CAN - EtherCAT and PC
5. Power on both the NJ501-1500 and the Anybus Communicator CAN - EtherCAT

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## 4. Test Setup

### 4.1 Sysmac Studio

1. Copy ABC\_CAN\_ETHERCAT\_V\_1\_08\_Omron 20140311\_SSv1.09\_NJv1.08.xml to the UserEsiFiles folder. This folder typically can be found in 'C:\Program Files (x86)\OMRON\Sysmac Studio\IODeviceProfiles\EsiFiles'

### 4.2 Device

To be able to use the Anybus Communicator CAN - EtherCAT the device needs to be configured to exchange data with the NJ501-1500.

1. Install Anybus Configuration Manager – Communicator CAN and CAN MiniMonitor V3 software
2. Start Anybus Configuration Manager – Communicator CAN
3. Create (new) project by clicking 'File\New' or 'Ctrl+N'
4. Select 'Network [CANopen]' and change 'Network Type' to 'EtherCAT'
5. Select 'Subnetwork' and right-click 'Subnetwork' and select 'Add Group' to add a group
6. Right-click 'Group #1' to add a transaction. Add a 'Produce' transaction
7. Change 'CAN Identifier' of 'Produce' transaction to 0x181 by clicking the 'CAN Frame [000]'
8. Add data object by right-clicking 'CAN Frame [181]' and select 'Add Data Object'
9. Change 'Data Length (Bytes)' to '4'
10. Right-click 'Group #1' to add a transaction. Add a 'Consume' transaction
11. Change 'CAN Identifier' of 'Produce' transaction to 0x161 by clicking the 'CAN Frame [000]'
12. Add data object by right-clicking 'CAN Frame [161]' and select 'Add Data Object'
13. Change 'Data Length (Bytes)' to '4'
14. Go online ('Online\Connect' or click )
15. Download the configuration ('Online\Download Configuration' or click )

See 'SSv1.09\_NJv1.08\_ABC\_CAN\_ETHERCAT\_V\_1\_08\_Omron 20140311\_SSv1.09\_NJv1.08.xml\_Device Setup.mp4' for details and configuration example.

## 5. Test Execution

### 5.1 T1: Device Description File

T1 tests if the ESI File is accepted by the ESI file checker and Sysmac Studio without errors.

For this device a modified ESI file (ABC\_CAN\_ETHERCAT\_V\_1\_08\_Omron 20140311\_SSv1.09\_NJv1.08.xml) needs to be used. The modified ESI file can be requested and provided by the Tsunagi Lab Europe as an example.

Test result: PASSED

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**5.1.1 ESI file checker (Version 1.0.9.1)**

```
#Checked by EsiChecker v1.0.9.1 - based on SysmacStudio V1.09
#- Devices -
#FileName,Model(VendorId:ProductCode:RevisionNo:Name),State,Detail
ABC_CAN_ETHERCAT_V_1_08_Omron 20140311_SSv1.09_NJv1.08.xml,0000001B:0000001D:00010008:Anybus Communicator CAN,Enabled,
Total Devices 1 / Safe Mode Devices 0 / Error Devices 0

#- Modules -
#FileName, Model(VendorId:ModuleIdent:Name),State,Detail
Total Modules 0 / Safe Mode Modules 0 / Error Modules 0

#- Source Errors -
no source errors.

#- Warnings(Devices) -
#FileName,Model,Warning
ABC_CAN_ETHERCAT_V_1_08_Omron 20140311_SSv1.09_NJv1.08.xml,0000001B:0000001D:00010008:Anybus Communicator CAN,The
Image under Device cannot be used. Reason: Failed to load images from elements under Row 17 Element Device.

#- Warnings(Modules) -
no warnings.
```

Device image data cannot be processed because the format is incorrect (non-fatal error).

**CONFIDENTIAL B****5.1.2 Sysmac Studio (Version 1.09)**

A detailed description on how to install third party ESI files and verify if the ESI file is accepted by Sysmac Studio see [1], [section 4-2-1 EtherCAT Configuration and Settings, page 4-98.](#)

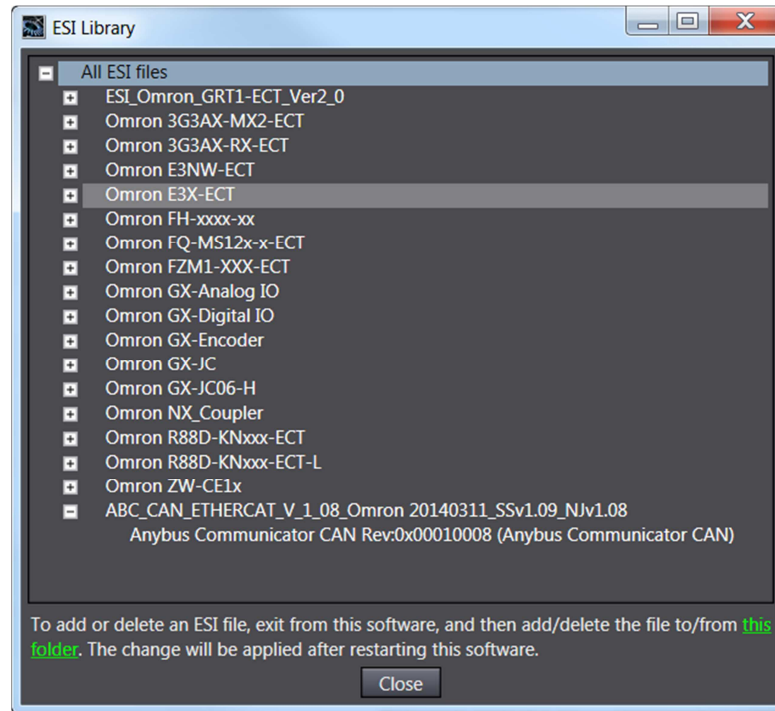


Figure 4. T1: ESI file check result using Sysmac Studio.

**5.2 T2: Data Exchange**

T2 tests if the:

- node address can be changed
- device recovers correctly from a dis-connect / re-connect of the EtherCAT cable
- device recovers from a power cycle and starts data exchange without errors
- device goes in data exchange with a changed Pdo map

1. Set communication parameters
2. Go online

**5.2.1 Node address test**

3. Change node address using 'Write Slave Node Address' or use (rotary) switches or other mechanisms
4. Verify node address

Test result: PASSED

See 'Ssv1.09\_NJv1.08\_ABC\_CAN\_ETHERCAT\_V\_1\_08\_Omron 20140311\_Ssv1.09\_NJv1.08.xml\_T2 Data Exchange - Node address.mp4' for details and verification results.

5. 'Compare and Merge with Actual Network Configuration' to add the device to configuration
6. Use default configuration and download configuration -> device in data exchange

NOTE:

Since the default configuration is empty (no objects allocated to Pdo maps) the device will not go in data exchange. The configuration needs to match the devices input and output size.



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See 'SSv1.09\_NJv1.08\_ABC\_CAN\_ETHERCAT\_V\_1\_08\_Omron 20140311\_SSv1.09\_NJv1.08.xml\_T2 Data Exchange - Pdo map.mp4' for details and verification results.

**5.2.2 Link test**

7. Dis-connect and re-connect EtherCAT cable from 'Port 2' on the NJ501-1500
8. Click 'Reset All' in 'Troubleshooting' to clear the error and re-start communication -> device in data exchange

Test result: PASSED

**5.2.3 Power test**

9. Power the device off and on
10. Click 'Reset All' in 'Troubleshooting' to clear the error and re-start communication -> device in data exchange

Test result: PASSED

See 'SSv1.09\_NJv1.08\_ABC\_CAN\_ETHERCAT\_V\_1\_08\_Omron 20140311\_SSv1.09\_NJv1.08.xml\_T2 Data Exchange - Link and Power.mp4' for details and verification results.

**5.2.4 Pdo map**

11. Change default mapping and download configuration -> device in data exchange

For detailed description to setup communication parameters, go online, write node address and add devices to the configuration see [1].


Test result: PASSED

See 'SSv1.09\_NJv1.08\_ABC\_CAN\_ETHERCAT\_V\_1\_08\_Omron 20140311\_SSv1.09\_NJv1.08.xml\_T2 Data Exchange - Pdo map.mp4' for details and verification results.

**5.3 T3: Basic Operation**

T3 tests the basic operation of the device under test.

The basic operation test(s) defined for this device are:

- Send output data to gateway and received input data
1. Start MiniMon V3
  2. MiniMon will automatically connect to the USB dongle and start displaying data. If not check the Bit Rate setting ('Options\Configuration\Baudrate') or run 'Run baud detection' by clicking 
  3. Change output data in 'I/O Map' view of Sysmac Studio
  4. Use MiniMon V3 to send data

See 'SSv1.09\_NJv1.08\_ABC\_CAN\_ETHERCAT\_V\_1\_08\_Omron 20140311\_SSv1.09\_NJv1.08.xml\_T3 Basic Operation.mp4' for details and verification results.

Test result: PASSED

**5.4 T4: Duration**

T4 tests if a no communication errors occur within <# hrs> hours.

Test result: Not tested