RutAdaptBoard-HMS User Manual

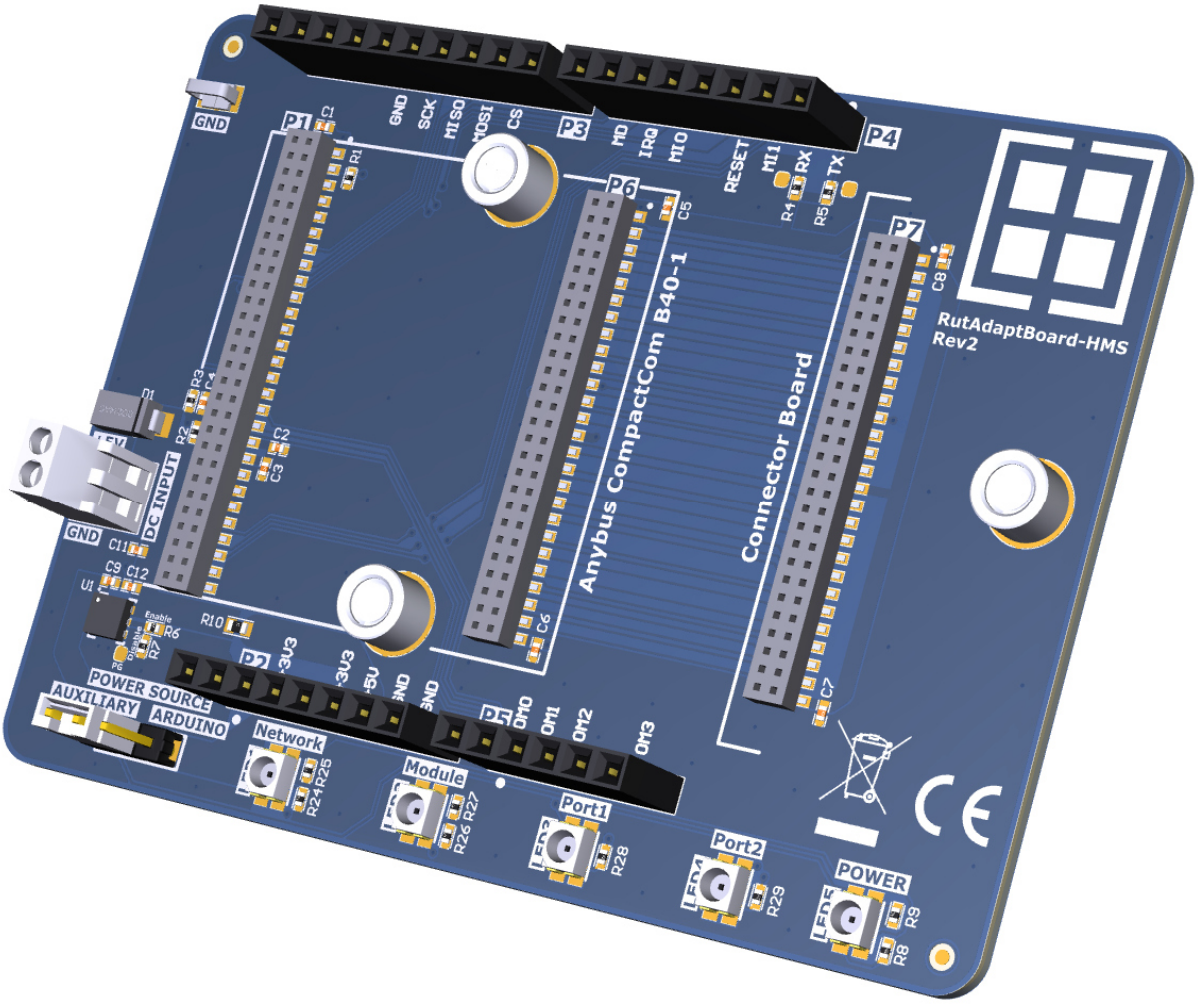


Table of Contents

Versions

Table 1

Version	Date	Rationale
0.1	September 29, 2020	First draft.

Introduction

RutAdaptBoard-HMS is an Arduino shield-adapter for HMS Anybus modules. This product enables users to connect HMS Anybus B40-1 modules to almost any development platform with Arduino connectors onboard. The adapter will accept HMS Connector Boards for PROFIBUS, Ethernet, CANopen, CC-Link, DeviceNet protocols, and more. HMS Anybus provides a solution for almost all industrial communication protocols, hence using RutAdaptBoard-HMS is a great choice for start-uppers.

Features

- UART or SPI interface via Arduino compatible connectors.
- Auxiliary 5V power source terminal (the 3.3V LDO voltage regulator is included).
- Power source selector (a selection between the Arduino connectors or Auxiliary DC input).
- LED indicators for Power, Status, and Network activity indication.
- A Test Point connector for a ground signal.
- SMD Standoffs for M3 screws.

Overview

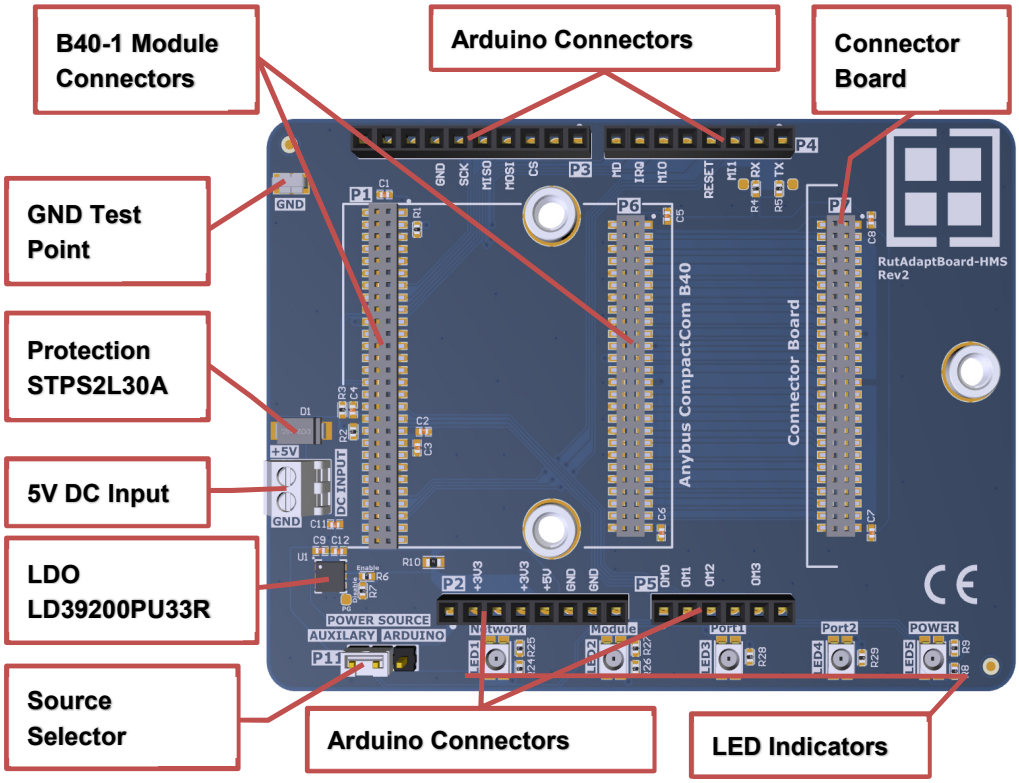


Fig. 1. HMS Adapter Board's layout.

Fig. 2. B40-1 Module and Connector boards.

Power Source Select

Fig. 3. Select power source between Auxiliary and Arduino.

The adapter board accepts two power sources: from Arduino connectors 3.3V or an Auxiliary power terminal 5V. **Warning: No more than 6V can be applied to the Auxiliary terminal**. The Auxiliary power terminal has the protection against reversed polarity voltage. Arduino 5V source also might be used. Please solder the R10 0R resistor to have the system powered from the Arduino 5V power source.

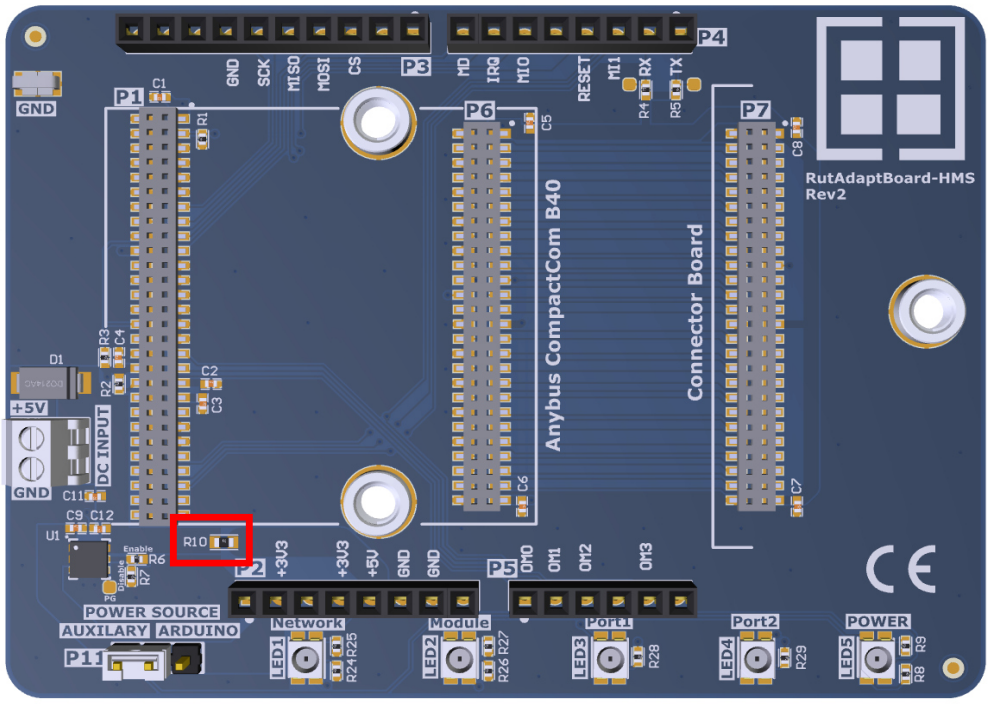


Fig. 4. R10 Location on the board.

Module Mounting

The *Anybus CompactCom B40-1* module is supposed to be used with the *RutAdaptBoard-HMS* shield only. Two metal M3 8mm length screws hold the module in position firmly. The connector board is mounted separately and fixed with only one screw.

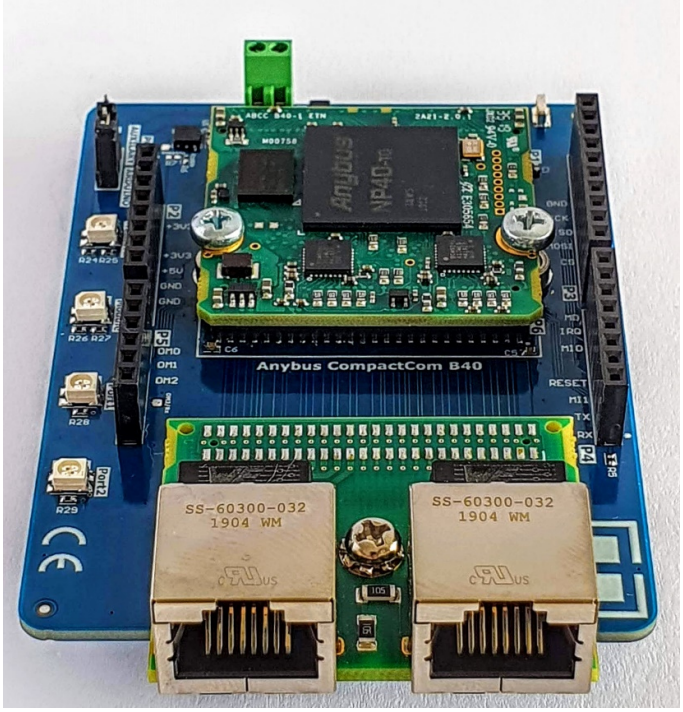


Fig. 5. Module and Connector Board mounted.

Supported firmware and software examples

Rutronik has developed the demo application for two platforms – RutDevKit with STM32L562 microcontroller and AURIX TC397 TFT kit. Both platforms are interfaced with the HMS module via UART. In addition to this, the Sensirion gas sensor SGP30 is used and it is interfaced via I2C.

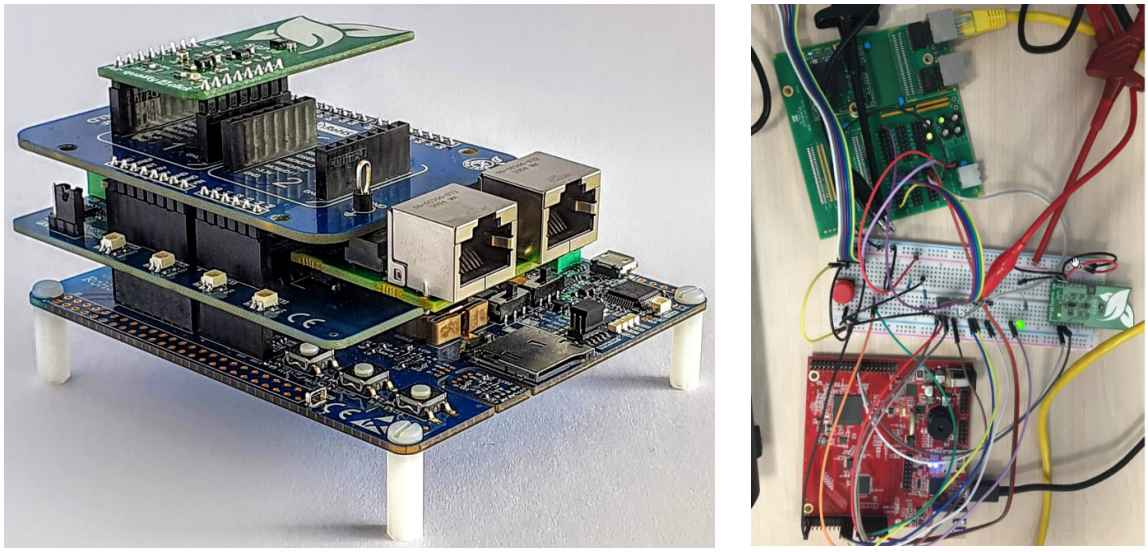


Fig. 6. RutDevKit and TC397 TFT Demo hardware setup

At the moment to run a Windows PC application representing the sensor values the Beckhoff's TwinCAT software needs to be used for run-time industrial Ethernet emulation.

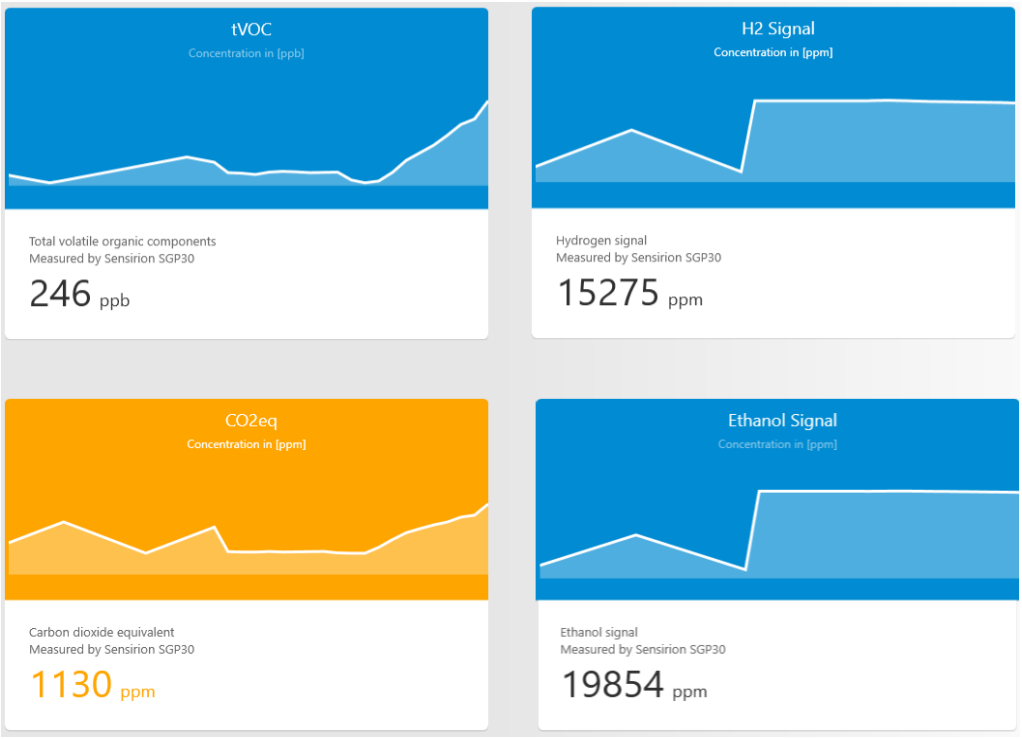
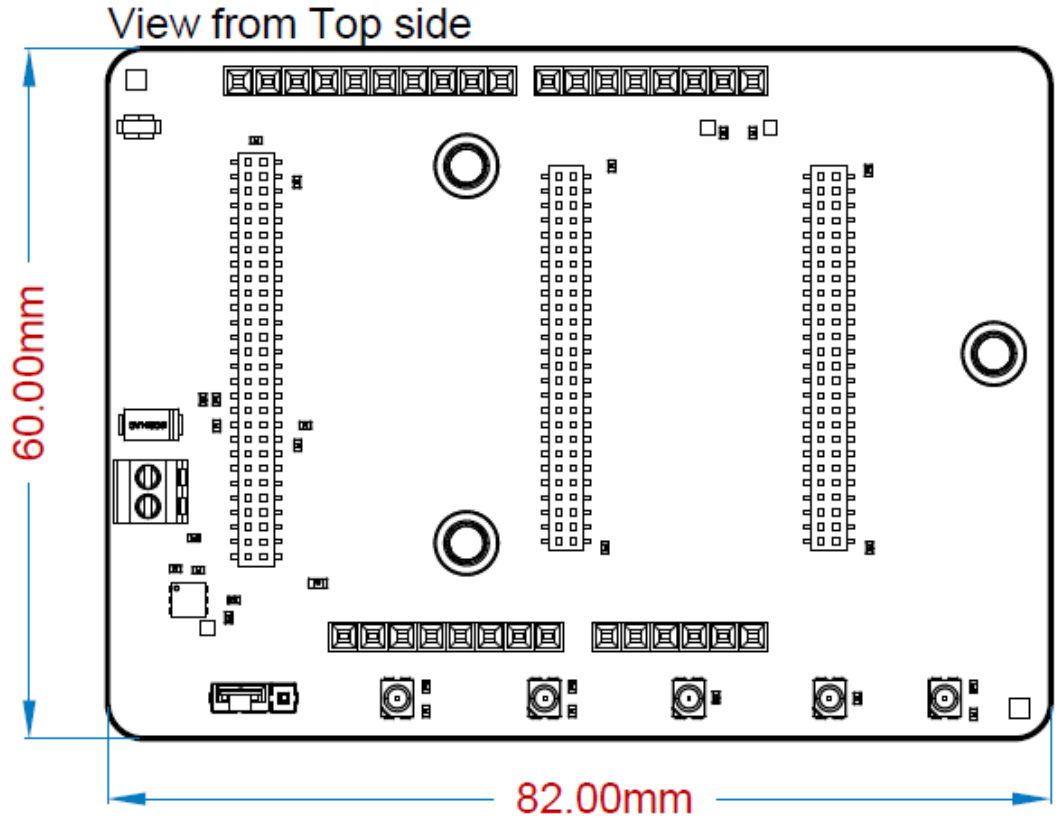
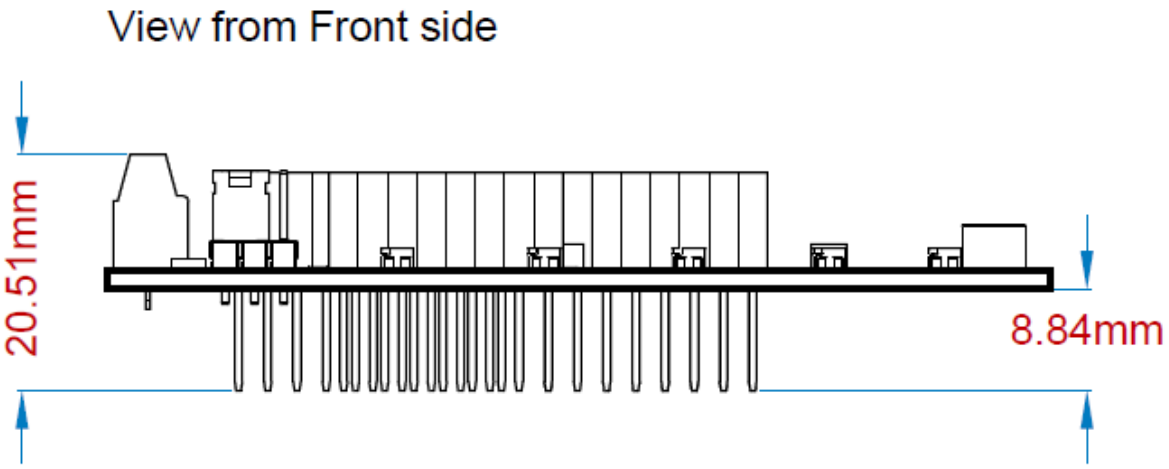


Fig. 6. Windows Demo Application.

Mechanical Layout





Bill of Materials

Designator	Value	Specification	Quantity	Manufacturer	Manufacturer Part No.	Supplier	Supplier part number
C1, C2, C3, C4, C5, C6, C7, C8, C9, C11, C12	10uF	X5R, 6.3V, 20%	11	Samsung EM	CL05A106MQ5NUNC	Rutronik	KKS2215
D1	STPS2L30A	30V, 2A	1	STMicroelectronics	STPS2L30A	Rutronik	DSKY5073
J1	MSD02004	2pos. 2.54mm, 12A	1	SAURO	MSD02004	Rutronik	CONN2626
JP1	63429-302LF	2.54mm, TIN	1	Amphenol FCI	63429-302LF	Rutronik	63429-302LF
LD1, LD2, LD5	LSGT67K-JL-1-0+HK-1-0-2-R18-Z	SMT	3	OSRAM	LSGT67K-JL-1-0+HK-1-0-2-R18-Z	Rutronik	LED24219
LD3, LD4	LYGT67K-JL-1+HK-1	SMT	2	OSRAM	LYGT67K-JL-1+HK-1	Rutronik	LED24482
MH1, MH2, MH3	P/N 24883	M3, 4mm	3	Keystone Electronics	P/N 24883	Rutronik	BAT6083
P1	HRS-2G-56-SG-SMT	0.050" Pitch, Dual Row, .085" Height, SMT	1	ADAM TECH	HRS-2G-56-SG-SMT	Rutronik	HRS-2G-56-SG-SMT
P2, P4	RS1-08-G-413	0.100" Pitch, THT	2	ADAM TECH	RS1-08-G-413	Rutronik	RS1-08-G-413
P3	RS1-10-G-413	0.100" Pitch, THT	1	ADAM TECH	RS1-10-G-413	Rutronik	RS1-10-G-413
P5	RS1-06-G-413	0.100" Pitch, THT	1	ADAM TECH	RS1-06-G-413	Rutronik	RS1-06-G-413
P6, P7	HRS-2G-52-SG-SMT	0.050" Pitch, Dual Row, .085" Height, SMT	2	ADAM TECH	HRS-2G-52-SG-SMT	Rutronik	HRS-2G-52-SG-SMT
P11	PH1-03-TA	0.100" Pitch, THT	1	ADAM TECH	PH1-03-TA	Rutronik	CONN1267
R1, R2, R4, R5, R6	1K	5% 0,063W	5	Yageo	RC0402JR-071KL	Rutronik	WRC33833
R3	100K	5% 0,063W	1	Yageo	RC0402JR-07100KL	Rutronik	WRC33855
R8, R9, R24, R25, R26, R27, R28, R29	220R	5% 0,063W	8	Yageo	RC0402JR-07220RL	Rutronik	WRC33818
TP2	5019	3.81*2.03	1	Keystone Electronics	5019	Rutronik	BAT4950
U1	LD39200PU33R	6V, 2A	1	STMicroelectronics	LD39200PU33R	Rutronik	LD39200PU33R

Legal Disclaimer

The evaluation board is for testing purposes only and, because it has limited functions and limited resilience, is not suitable for permanent use under real conditions. If the evaluation board is nevertheless used under real conditions, this is done at one's responsibility; any liability of Rutronik is insofar excluded.