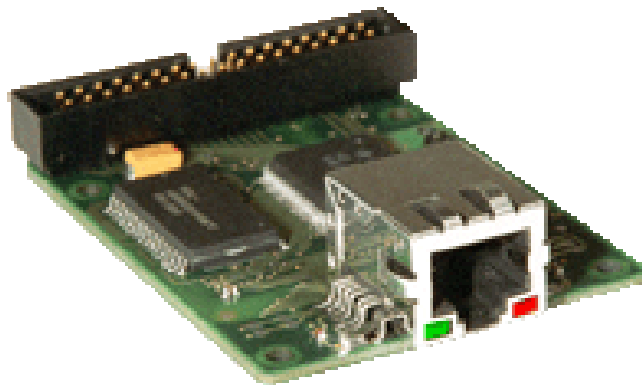# *ID1021*

Network Connectivity Module

Datasheet

Version 2.0

Overview

The ID1021 is a ready-to-use electronic module that can be integrated into an existing or new OEM product for quickly & easily realizing an internet interface for the product.

The ID1021 comes with an ethernet interface for connections to an intranet or internet. A 34-pole host interface is included that supports connections to all kinds of machines and devices.

The ID1021 internal software includes a full-fledged TCP/IP stack, FTP server, HTTP server and flash file system for storage of application software and webcontent.

ID1021 - front	ID1021 - back

Applications

Typical OEM products for which the ID1021 module can be applied:

- Climate control systems (heating & cooling)
- Alarm systems
- Vending and dispenser machines
- Access control systems
- Water management systems
- Meteorological systems
- Traffic control and management systems
- Displays, signs and information systems
- Energy metering and logging systems
- Other telemetric and sensor systems
- Protocol converters

Functions that can be realized with the ID1021 module:

- Remote control/configuration of OEM product using web browser and FTP.
- Communications with legacy OEM product with RS232, RS485 or TTL I/O interfaces. (protocol-conversion, 'tunneling' / 'bridging')
- Remote servicing/upgrading of OEM product firmware/software/databases via the internet.
- Remote data acquisition & logging, periodic retrieval of data using FTP.

Specifications

Hardware

Dimensions: *64 x 50 x 25 mm (l x w x h)*

Supply voltage: *5V (+- 5%)*

Power consumption: *< 150 mA*

Temperature range: *0 - 70° Celsius*

Processor: *Renesas H8S microcontroller, running at 20 MHz*

Memory:
- *128 KB RAM (for volatile application data, heap and stack)*
- *2 MB Flash EEPROM (for storage of applications and webcontent)*
- *8 KB serial EEPROM (for storage of non-volatile parameters)*

Memory expansion options: up to 512 KB RAM, 32 KB serial EEPROM

External interfaces

Network interface

- *1 x Ethernet, 10 Mbit, UTP (RJ45)*

Host interface

- *2 x RS232 (TTL)*
- *1 x RS485 (120 ohm terminated)*
- *22 programmable I/O pins (TTL I/O, A/D, D/A, PWM)*

Host interface uses 5V logic for all I/O pins.

Software

Firmware

The ID1021 comes with the following software pre-installed in the internal flash memory of the Renesas microcontroller:

- Dedicated OS that provides resource management and scheduling services. Supports multiple concurrent applications. Application Programming Interface (API) is available for writing your own applications.
- TCP/IP stack that includes Ethernet v2.0, IEEE 802.3, ARP, IP, ICMP, UDP, TCP, NetBIOS, DHCP, telnet, HTTP, FTP.

- Embedded FTP server, HTTP server, telnet server
- Embedded file system for flash EEPROM, serial EEPROM and (optional) RAM disk. Run-time accessible with FTP.

Application software

Ready-to-use applications

Necoso has developed numerous applications for the ID1021. Check out our website at *www.necoso.com* for a list of available applications.

Writing new applications

Doing it yourself...

Applications for the ID1021 are written using the C programming language. You can develop applications yourself with the ID1021 Application Development Kit (ADK), see below.

...or let us do it for you.

You don't have the knowledge, the manpower or the time to write applications yourself? Maybe we can do it for you. Contact us for more information.

Documentation

Following documentation is available for the ID1021:

- Datasheet (this document)
- ID1021 Installation Manual (OEM version)
- ID1021 Application Notes

All documentation is available in electronic format (MS-Word) and can easily be customized for OEM product.

Host Interface Function Matrix

Pin alias	Digital input	Digital output	Timer pulse unit Channel 0	Timer pulse unit Channel 1	Timer pulse unit Channel 2	Timer pulse unit Channel 3 [1]	Timer pulse unit Channel 4	Timer pulse unit Channel 5	Analogue input 10 bits	Analogue output 8 bits	8-bit timer channel 0	8-bits timer channel 1	Serial / SCI Channel 0	Serial / SCI Channel 1	RS485 [2]	Interrupt	Prog. Pulse generator PPG	Fast access bus 8 bit width
IO0	x															IRQ2(I)		
IO1	x															IRQ3 (I)		
IO2	x	x																
IO3	x	x																
IO4	x	x						IOA (B)			TMO (O)			SCK (B)			PO6 (O)	
IO5	x	x							ADTRG (I)									
IO6	x	x												RXD (I)				
IO7	x	x												TXD (O)				
IO8	x	x						IOB (B)				TMO (O)	SCK (B)				PO4 (O)	
IO9	x	x					IOB (B)					TMC (I)	RXD (I)				PO5 (O)	
IO10	x	x					IOA (B)					TMR (I)	TXD (O)				PO7 (O)	
IO11	x	x											SCK (B)			IRQ0 (I)		
IO12	x	x				IOC (B)			AN0 (I)		TMR (I)						PO2 (O)	
IO13	x	x				IOD (B)			AN1 (I)		TMC (I)					IRQ1 (I)	PO3 (O)	
IO14	x	x	Clk D (I)		IOB (B)			Clk D (I)	AN7 (I)	DA0 (0)							PO15 (O)	D7
IO15	x	x			IOA (B)				AN6 (I)	DA1 (I)							PO14 (O)	D6
IO16	x	x	Clk C (I)	IOB (B)	Clk C (I)		Clk C (I)	Clk C (I)									PO13 (O)	D5
IO17	x	x		IOA (B)					AN5 (I)								PO12 (O)	D4
IO18	x	x	Clk B (I) IOD (B)	Clk B (I)	Clk B (I)				AN4 (I)								PO11 (O)	D3
IO19	x	x	Clk A (I) IOC (B)	Clk A (I)	Clk A (I)	Clk A (I)	Clk A (I)										PO10 (O)	D2
IO20	x	x	IOB (B)						AN3 (I)								PO9 (O)	D1
IO21	x	x	IOA (B)						AN2 (I)								PO8 (O)	D0

[1] TPU channel 3, IOA and IOB not wired.
[2] RS485 is connected at pin 33(neg) and 34 (pos) of the 34 pole connector.

Host interface connector

PIN no.	Function
1	RS485 (neg)
2	RS485 (pos)
3	IO2
4	IO3
5	GND
6	GND
7	IO4
8	IO5
9	IO6
10	IO7
11	IO8
12	IO9
13	IO10
14	IO11
15	IO12
16	IO13
17	IO14
18	IO15
19	IO16
20	IO17
21	IO18
22	IO19
23	IO20
24	IO21
25	VCC
26	VCC
27	GND
28	MR (Master reset, active low input)
29	(reserved, don't connect)
30	(reserve, don't connect)
31	GND
32	GND
33	IO0
34	IO1

Pin numbering as in mechanical drawing further on.

UTP interface connector

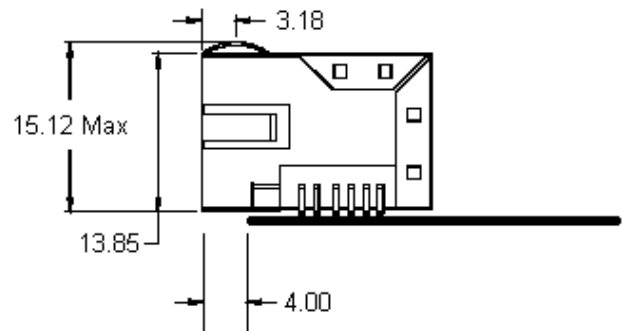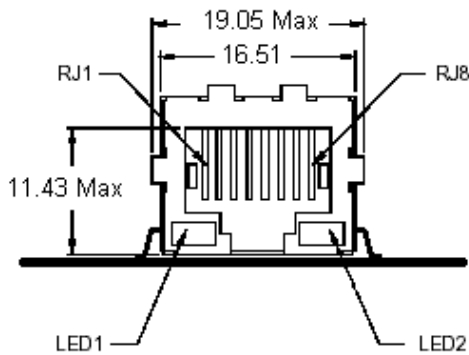| RJ45 pin no.	Function
1	TXP
2	TXN
3	RXP
6	RXN

Dimensions
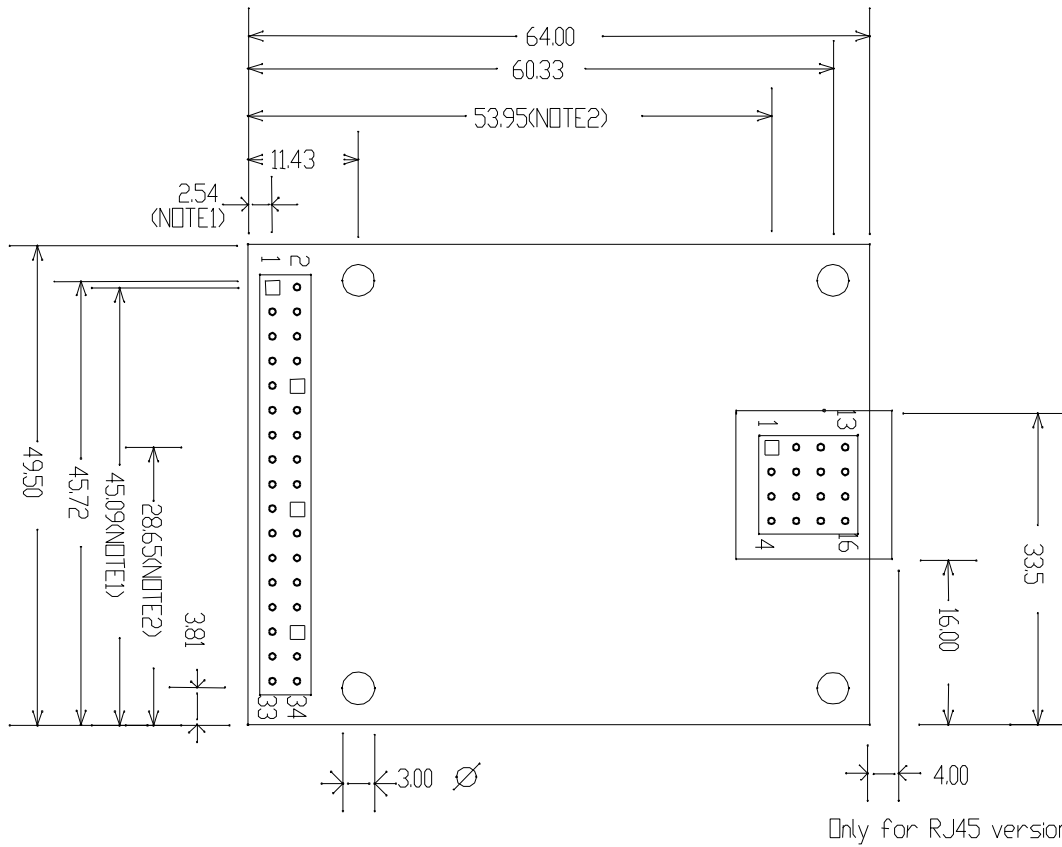
NOTE1: Pin 1 position host interface
NOTE2: Pin 1 position ethernet extension
Connectors on 100 mil raster

Only for RJ45 version

RJ45 connector dimensions in mm (tolerance +/- 0.2 mm)

Availability options

Ready-to-use electronic module

The ID1021 is available as a ready-to-use electronic module. The fastest and easiest way to realize an internet interface for your OEM product.

Design-in package

The ID1021 technology is also available as a design-in package for integration on your own PCB. The design-in package consists of the ID1021 electronic schematics and the internal software for microcontroller that is on the ID1021. Reasons for preferring the design-package above the ready-to-use electronic module could be:

- Saving space. Only one PCB instead of two.
- Avoiding the connectors that are otherwise required between OEM PCB and ID1021.
- Realizing the most economical solution by stripping all not used functionality/components.
- Being independent as to customizing the software, hardware and/or mechanics.
- Being independent as to the placing of the ID1021 external interfaces for network and host.
- Being independent as to the ID1021 logistics.

Contact us for more information.
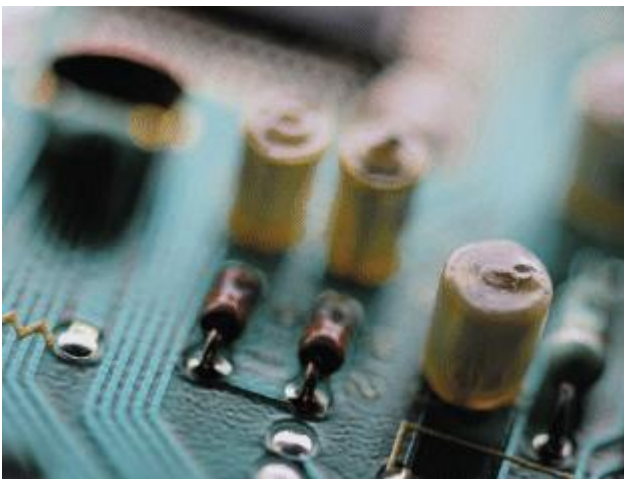
Custom design-in

If the ID1021 design does not completely match the internet connectivity requirements for your OEM product then may be we can adapt it for your needs.

Contact us for more information.

ID1021 Application Development Kit (ADK)

IWB + ID1021

(PRELIMINARY)

Overview

The ID1021 Application Development Kit (ADK) enables software developers to build their own applications for the ID1021. Applications are written using the C programming language. Application Programming Interfaces (APIs) are available for the ID1021 internal software as well as for the applications that Necoso has developed for the ID1021.

Specifications

ADK contents

- ID1021 Workbench Board (IWB, see picture above)
- 1 x ID1021
- 9V DC power adapter
- CD-ROM containing C development environment, manuals and tools
- Miscellaneous interface cables

IWB specifications

The IWB is a workbench board for the ID1021 module. It can be used as a standalone development environment for developing and testing software applications for the ID1021.

The IWB contains a docking connector for placing an ID1021 module, a 5V regulator for providing the ID1021 with power, interface connectors for host interface, RS232 and RS485. Also includes switches for resetting the ID1021 or forcing it into boot mode. The IWB shifts the levels of the RS232 ports of the ID1021 to the V.24 level, so that they can be directly connected to a COM port of a PC.

Interface summary

- 2 x RS232 (V.24, male DB9 connectors)
- 1 x RS485 (screw-terminal connectors)
- 34-pole male and female host interface connector
- Reset switch
- Boot mode switch
- 8 free programmable LED indicators (e.g. for software debugging, status indications, etc)

CD-ROM contents

- MS-Windows hosted GNU compiler / Linux hosted GNU compiler
- GNU linker
- GNU debugger / HDI debugger
- ID1021 Installation Manual
- ID1021 Programmers Reference Manual
- ID1021 Application Notes
- API header files
- Example applications
- BROLIA & ABS2REL management tools

CONTACT INFORMATION

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