

MICRONIX BLACKBIRD RTU

MULTIPURPOSE PC-BASED RTU / -DATALOGGER
SYSTEM WITH INTEGRATED GSM/GPRS MODEM

User Manual & Installation Guide

VERS. 3.0



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Table of Contents

TABLE OF CONTENTS	2
REVISION HISTORY	3
GENERAL INFORMATION	4
ORDERING CODES	4
<i>Analogue configurations</i>	4
ACCESSORIES	4
DESCRIPTION	5
CONNECTORS	6
VGA CONNECTOR HD15	6
PS/2 KEYBOARD	7
GSM ANTENNA	7
USB CONNECTORS	7
ANALOGUE INPUTS AIN	8
DIGITAL OUTPUTS DOUT	8
DIGITAL INPUTS DIN	9
SERIAL CONNECTORS COM1, COM2	9
SERIAL PORT (COM4)	10
ETHERNET CONNECTOR	10
CPU BOARD	10
GSM/GPRS MODEM	11
SOFTWARE	12



Revision history

Revision number	Reason for change	Date
1.0	Initial revision	31-Oct-06
2.0	Ordering codes updated	04-Nov-08
3.0	Corrected function names in I/O connectors	20-Oct-09



General information

The Micronix Blackbird RTU offers a unique combination of GSM/GPRS MODEM and I/O signals in one PC-based control unit.

Ordering codes

Available models:

Model no	CPU			GSM/GPRS MODEM	Communication interface	Digital I/O	Analogue I/O	Serial ports
	VORTEX86 -300MHz	Vortex86 -533MHz	VORTEX86DX -800MHz					
MB-6000-X	•			•	VGA, keyboard	•	•	2XRS232
MB-7000-X		•		•	VGA, keyboard, 2xUSB, Ethernet	•	•	2XRS232
MB-7200-X			•	•	VGA, keyboard, 2xUSB, Ethernet	•	•	2XRS232

Analogue configurations

The Micronix Blackbird RTU is available with different analogue configurations. The configuration is indicated by a digit(X) following the model number, e.g. MB-7000-1. This can be:

Digit	Configuration
-1	8AI: AI0-7 = 0-2.5V
-2	8AI: AI0-7 = 0-5.0V
-3	8AI: AI0-7 = 0-10.0V
-4	8AI: AI0-7 = 0-20.0mA
-5	8AI: AI0-3 = 0-2.5V, AI4-7 = 0-20mA

Accessories

These accessories must be ordered separately if needed.

Model no	Ordering code	Description
GSM cable	126.033.000	RG136 cable with MMCX-SMA MALE 140mm
GSM Antenna	060.302.001	GSM antenna with SMA connector
CM-2	425.104.001	Mains cable with one crimp connector mating KL1, 30cm
CDB-9M	425.104.002	Cable with one DSUB9 male and one 10pin IDC-connector, 30cm Used for connecting RS232.

Description

Micronix Blackbird RTU is based on a standard PC/104 CPU (386 up to Pentium class) and a PV-1800 series PC/104 card including a 20W power supply, GSM/GPSR MODEM, digital and analogue channels. This main components are built-in a black painted metal housing with a lot of interface connectors located on the upper and lower side of the cabinet. The cabinet is prepared for DIN-Rail mounting.

Micronix Blackbird RTU offers features such as:

- A quad band GSM/GPSR MODEM that allow digital communication services wherever a GSM 850, 900, DCS 1800 or PCS 1900 network is present.
- Internal SIM card holder.
- Internal Flash Disk for operating system and user programs.
- Connector for an auxiliary antenna.
- 8 isolated analogue (0-10V) inputs – 12bits.
- 8 isolated digital inputs (24V).
- 7 isolated digital outputs (24V).
- 2 standard COM-ports (one extra only on PV-1800).
- 2 USB-ports.
- PS/2 connector for a PC-keyboard.
- VGA connector for an external monitor.
- Ethernet connector (CPU dependent).
- 24V-DC power input to the 20W DC/DC converter.
- Accessories for DIN-Rail mounting.

A schematic drawing is shown here:

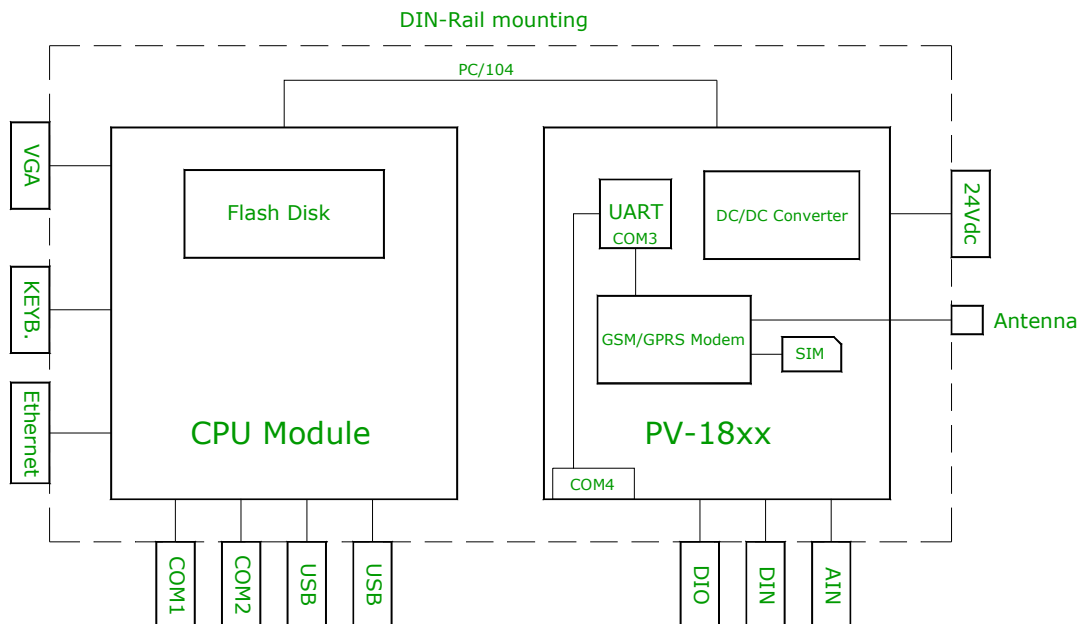


Fig. 1.

Connectors

As mention, all interfaces are made through connectors located on the upper and lower side of the cabinet. These connectors are shown here:

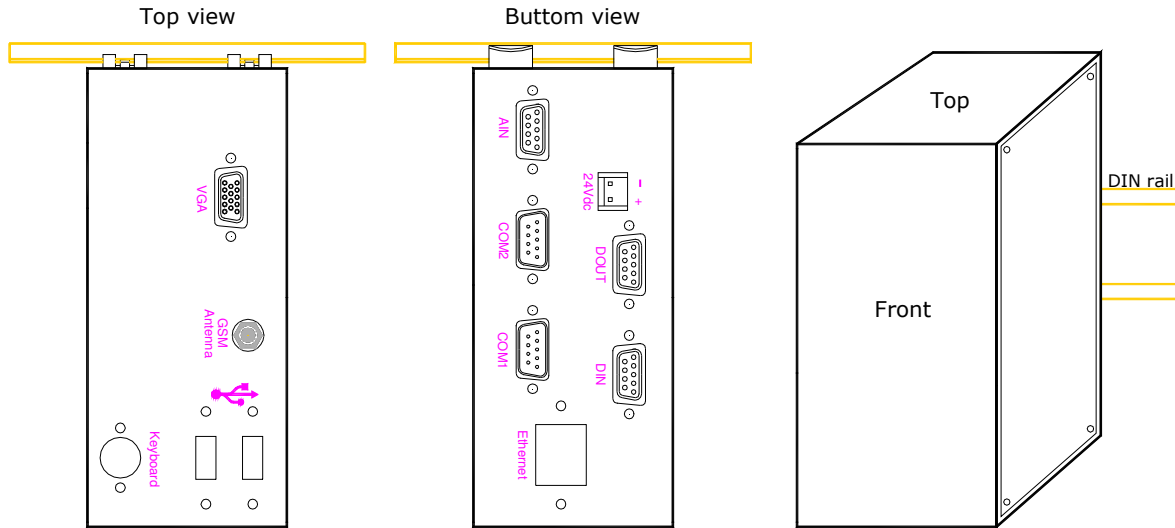
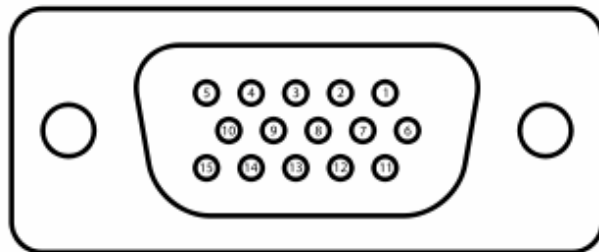


Fig. 2.

VGA connector HD15

Connection of an external monitor can be made using a HD15 connector placed at the upper side of the cabinet. The connections in this connector are shown here:

Pin #	Function
1	Red video
2	Green video
3	Blue video
4	N/C
5	Gnd
6	Red return
7	Green return
8	Blue return
9	N/C
10	Gnd
11	N/C
12	SDA
13	Hsync
14	Vsync
15	SCL



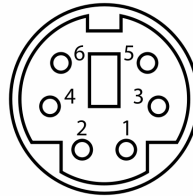
HD15 female



PS/2 keyboard

The user can attach an external keyboard to the Micronix Blackbird RTU. This keyboard must be equipped with a PS/2 connector. The connections in this connector are shown here:

MiniDIN-6	
Pin #	Function
1	+DATA
2	Reserved
3	GND
4	Vcc
5	+CLK
6	Reserved



PS/2 connector

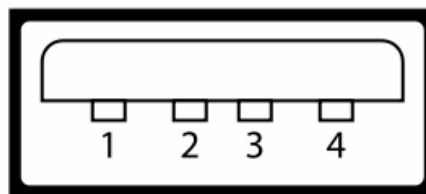
GSM antenna

The connection between the internal MODEM and the external antenna is a SMA straight cable jack –female with an impedance of 50Ω. A suitable external antenna could be a 1/2λ dipole whip with SMA male connector intended for the 900MHz band.

USB connectors

Micronix Blackbird RTU’s with the model no: MB-7200 and MB-7000, has built-in two USB host connections. The connections in those connectors are shown here:

USB type A	
Pin #	Function
1	Vbus(5V)
2	D-
3	D+
4	GND



USB type A connector

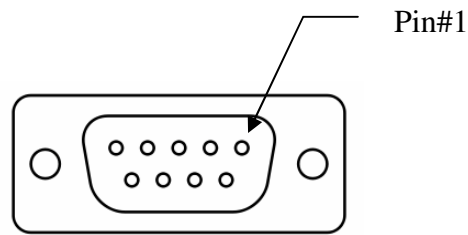
Analogue inputs AIN

The Micronix Blackbird RTU has 8 isolated analogue inputs accessible in a DSUB9 female connector.

Depending on the model – see section *ordering codes* – each input will have a full scale of 2.5V, 5.0V, 10V, or 20mA.

The table shows the connector layout:

DSUB9 female	
Pin #	Function
1	Analogue COM
2	Analogue input#6
3	Analogue input#4
4	Analogue input#2
5	Analogue input#0
6	Analogue input#7
7	Analogue input#5
8	Analogue input#3
9	Analogue input#1

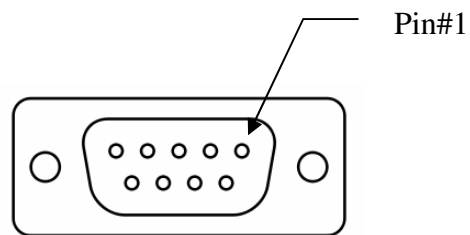


More information concerning the analogue section in Micronix Blackbird RTU can be found at this link: <http://www.micro-technic.com/pv1800>

Digital outputs DOUT

The Micronix Blackbird RTU has 7 isolated digital outputs connected to a DSUB9 female connector. The outputs are configured as PNP outputs with their transistors connected to an external supply voltage (+V_EXT). The table shows the connector layout:

DSUB9 female	
Pin #	Function
1	Digital output #0
2	Digital output #2
3	Digital output #4
4	Digital output #6
5	+V_Ext
6	Digital output #1
7	Digital output #3
8	Digital output #5
9	-V_Ext

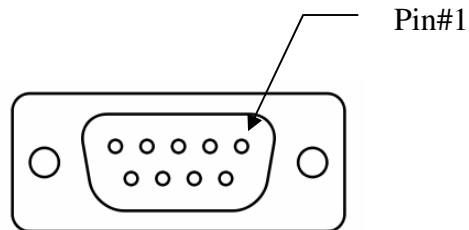


More information concerning the digital outputs in Micronix Blackbird RTU can be found at this link: <http://www.micro-technic.com/pv1800>

Digital inputs DIN

The Micronix Blackbird RTU has 8 isolated digital inputs connected to a DSUB9 female connector. All the inputs have ac-couplers with a common ground reference. Because of the ac-couplers, the inputs can be activated with positive as well as negative input voltages. The table shows the connector layout:

DSUB9 female	
Pin #	Function
1	Digital input #0
2	Digital input #2
3	Digital input #4
4	Digital input #6
5	Dig_Inp COM
6	Digital input #1
7	Digital input #3
8	Digital input #5
9	Digital input #7

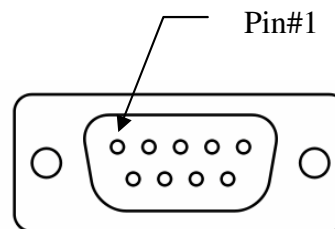


More information concerning the digital inputs in Micronix Blackbird RTU can be found at this link: <http://www.micro-technic.com/pv1800>

Serial connectors COM1, COM2

The two serial ports from the CPU are located in the connectors named: COM1 and COM2. These connectors are directly connected to two box headers (COM1 & COM2) on the CPU board. The table shows the connector layout:

DSUB9 male	
Pin #	Function
1	CD
2	RxD
3	TxD
4	DTS
5	GND
6	DSR
7	RTS
8	CTS
9	RI

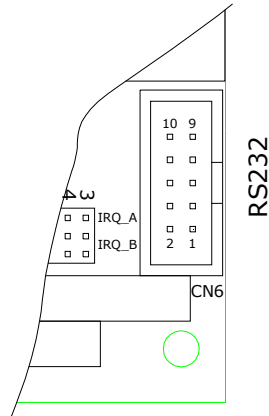




Serial port (COM4)

Internal on the PV1800 board there is an extra comport which can be accessed through a 10pin box header (CN6).

10pin Box Header - CN6	
Pin #	Function
1	GND
2	RI
3	DTS
4	CTS
5	TxD
6	RTS
7	RxD
8	DSR
9	CD
10	N.C.



Serial connector on PV1800

This serial port has a default setup to COM4, IRQ 12.

More information concerning setup of the serial port on PV1800 the Micronix Blackbird RTU can be found at this link: <http://www.micro-technic.com/pv1800>

Ethernet connector

A Micronix Blackbird RTU Model MB-7000 is equipped with a RJ45 LAN connector for 10/100Mbps Ethernet communication.

CPU Board

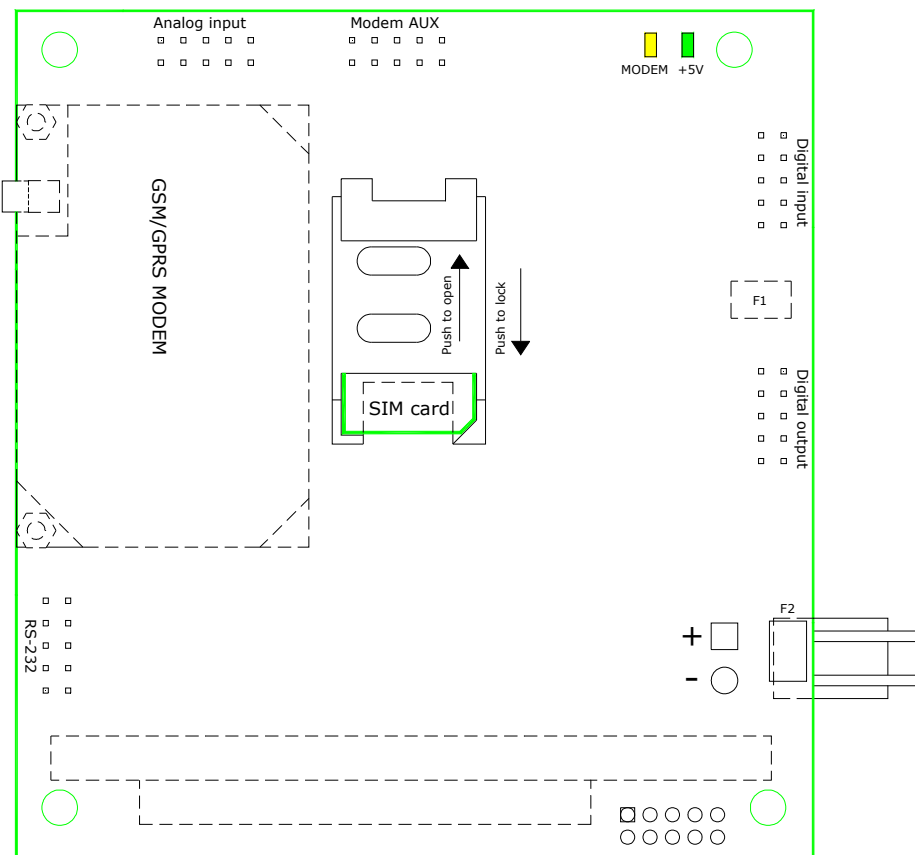
The CPU board that resides in a Micronix Blackbird RTU depends on the actual model.

More information on the CPU can be found at one of these links:

Model #	Link for more information
MB-6000	http://www.micro-technic.com/content/download/10772/94856/file/pv-6154 CPU board.pdf
MB-7000	http://www.micro-technic.com/content/download/1863/10453/file/Micronix PV-6270 datasheet.pdf
MB-7200	http://www.micro-technic.com/content/download/10776/94887/file/pv_6354_datasheet.pdf

GSM/GPRS MODEM

All Blackbird models are equipped with an internal GSM/GPRS MODEM. The MODEM is mounted on the PV-1800 and has a SIM card connector placed on the rear side of this module. The SIM card connector can be accessed when the left side plate is removed. A SIM card can be inserted into the SIM card connector by following the advice shown on the drawing below. On the rear side of PV-1800 two LEDs, named: MODEM & +5v, are located. The MODEM LED is off when the MODEM is off. The MODEM is on when the MODEM is powered on but not connected to a network. The MODEM LED is flashing when the MODEM is connected to a network. The +5V LED indicates the system power.



Rear side of PV-1800



Software