Technical Manual for

RTCU-M7

Version 1.01

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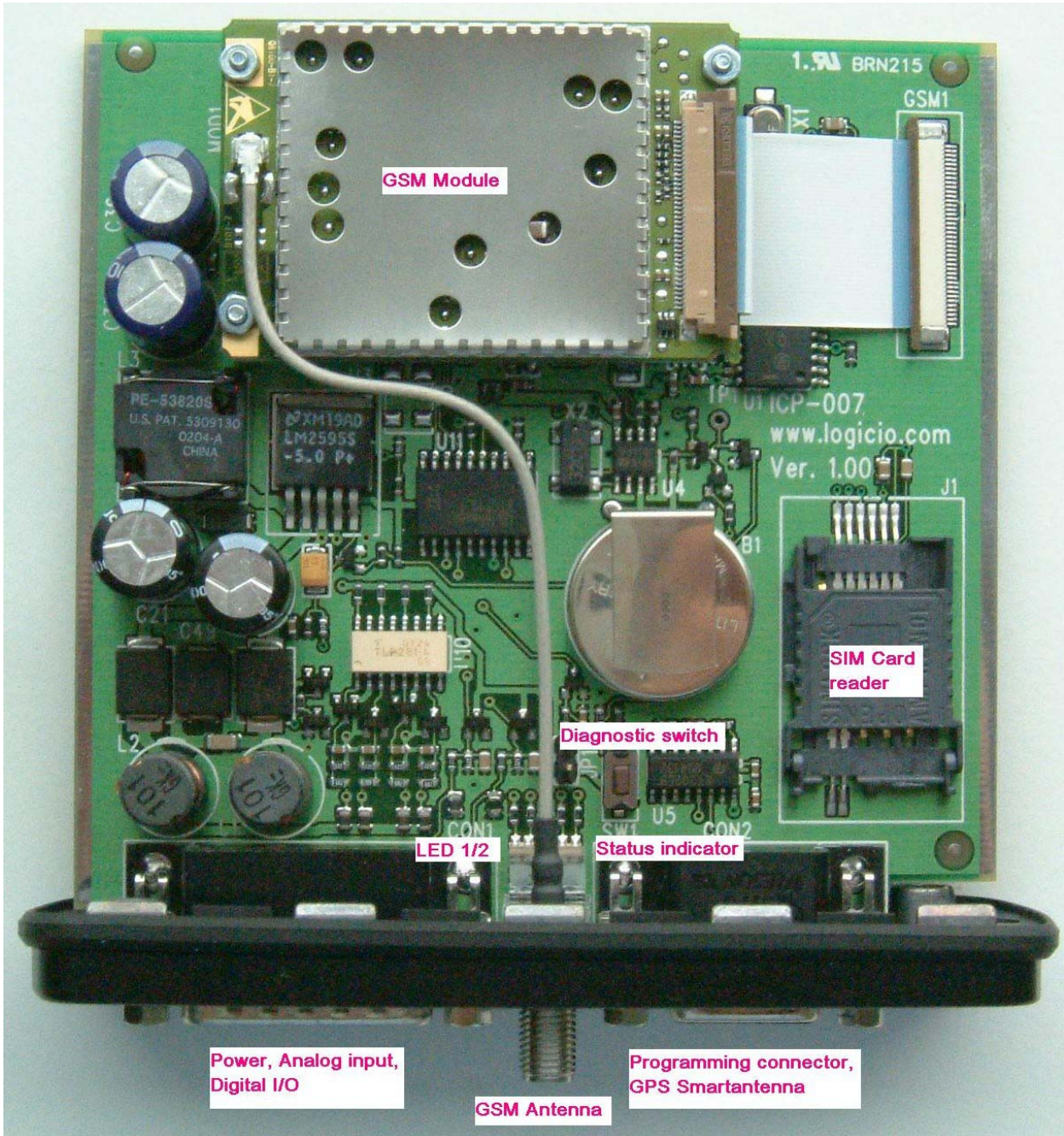Jyllandsgade 54, 8700 Horsens, DK

Introduction

The RTCU-M7 unit is an advanced unit in the RTCU product line with an impressive list of features and possibilities. The product is a unique combination of a powerful PLC and a GSM phone tightly connected in a single easy programmable unit with external GPS-Smartantenna support. The RTCU-M7 product provides the user-friendly answer to your mobile tracking, remote monitoring, remote control, surveillance and datalogging needs. The RTCU-M7 allows rapid development of custom specified applications combining mobile tracking / control / monitoring / datalogging with advanced communication techniques such as voice / DTMF interaction (voice response systems), alarm/messages send to / from the unit as SMS (both as SMS and PDU) messages or via data-transfer directly to / from most Windows application. The RTCU-M7 has seamless support for connection of an external GPS smartantenna via. the RS232 connection port.

This manual contains technical documentation allowing easy installation and use of the unit. For programming information please consult the RTCU Programming Documentation and/or the RTCU IDE Online help

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Graphical view

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External connections

All connections to external equipment (except the GSM antenna) is done using two DUB-D connectors, one 15 pin and one 9 pin, located at one of the end-plates of the unit, se picture below:

Power supply

The RTCU-M7 unit is to be supplied with 8..34 VDC:

Power/IO connector, 15 pin Male connector:

Pin	Name	Description
1	SUPP	Power supply, positive (+) connection
2	SUPP	Power supply, positive (+) connection
9	GND	Power supply, ground (-) connection
10	GND	Power supply, ground (-) connection

Analog Inputs

The analog inputs are voltage inputs, with a range from 0V to 5V DC

The input signal is connected between AIn and AGND. AGND must be connected to the reference of the connected equipment.

Power/IO connector, 15 pin Male connector:

Pin	Name	Description
7	AGND	Analog ground
8	AI2	Analog input number 2
15	AI1	Analog input number 1

Digital Inputs

The digital inputs are galvanic isolated from the RTCU with optocouplers and they are also low-pass filtered and transient protected. To activate the inputs, connect a positive voltage between the input and GND connector.

Power/IO connector, 15 pin Male connector:

Pin	Name	Description
3	DI1	Digital input number 1
4	DI2	Digital input number 2
5	DI3	Digital input number 3
6	DI4	Digital input number 4
9	GND	Power supply, ground
10	GND	Power supply, ground

Digital outputs
.The digital outputs will output the SUPP voltage (minus a small voltage drop), when they are activated from the VPL program. The outputs are taken from the GND and Don pins

Power/IO connector, 15 pin Male connector:

Pin	Name	Description
9	GND	Power supply, ground
10	GND	Power supply, ground
11	DO1	Digital output number 1
12	DO2	Digital output number 2
13	DO3	Digital output number 3
14	DO4	Digital output number 4

GPS/Programming connector
The GPS Smartantenna is connected to the SUB-D9 pin connector. This connector is also used as a programming connector. In order to use the connector as a programming connector, the RSDET pin must be connected to GND. When the GPS Smartantenna is connected, the RSDET pin must be left unconnected.

GPS/Programming connector, 9 pin Female connector:

Pin	Name	Description
1	NC	Leave unconnected
2	RxD	RS232 Receive data FROM GPS/PC
3	TxD	RS232 Transmit data TO GPS/PC
4	NC	Leave unconnected
5	GND	Power supply, ground to GPS/PC
6	RSDET	Programming cable detect, normally unconnected (if programming cable, connect to GND)
7	GPSPWR	+5V power supply TO GPS (switchable from VPL using gpsPower() function). Maximum current is 250 mA !
8	NC	Leave unconnected
9	NC	Leave unconnected

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Installing SIM card / connecting the GSM antenna

SIM Card
The RTCU unit contains a standard SIM card reader. It is located to the right on the printed circuit board, just below the programming connector. The SIM card reader is opened by carefully pressing down on the lid of the reader, and at the same time, pressing the lid towards the screw terminals. It is then possible to open the SIM card reader, and insert your SIM card into it. Close the lid by pressing it down, while at the same time, pressing it towards the programming connector.

GSM Antenna
The RTCU unit contains an SMA Female connector for connection of a suitable GSM Dual band antenna (900/1800 MHz). When installing the antenna, please make sure that the antenna is not in close proximity of metallic parts or anything else that can influence the efficiency of the GSM antenna. Please consult the installation guide that follows the GSM antenna.

Switches / Indicators
A status indicator is present on the unit (see the graphical view). Different colors/blinking patterns are used to signal different types of errors/status change in the RTCU unit:

Fastest blinking, green	The unit is initializing, preparing to start the VPL program
Fast blinking, green (or yellow)	The VPL program is not executing, stopped by the reset/diagnostic switch.
Slow blinking, green (or yellow)	The unit is executing the VPL program
Fast blinking, red (or yellow)	A runtime error has been detected in the program
Alternating Fast/Slow, red (or yellow)	The unit has lost its Firmware ! This can only happen if, during a firmware upgrade, the RTCU Unit looses power, or the communication is lost completely. In this case, simply upload the firmware to the unit again.

If the color of the status indicator is yellow, the unit is actively communicating with for example, the RTCU-IDE program (or another program, supporting the RTCU protocol, RACP).
The RTCU unit contains a combined reset/diagnostic switch. This switch is located just to the right of the two light pipes. When this switch is activated during reset of the unit (or power on), the VPL program/project uploaded to the unit, will not be started. The status indicator indicates this. If the switch is activated for more than 3 seconds, the unit will reset (same as power on).
A two-colored (red/green) indicator is visible above the status indicator. This indicator can be controlled from within the VPL program in the unit, the green part is accessed as LED1 and the red part as LED2

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Specifications

Analog inputs	Min		Max		
	0	-	+5	VDC	Resolution is 10 bits. All inputs are protected against transients and lowpass

Digital inputs		Min	Typ	Max		
	Logic "High"	8	12	40	VDC	All inputs are protected against transients and lowpass filtered. All inputs are optically isolated
	Logic "Low"	-5	-	5	VDC	

Digital outputs (Solid state)	Min		Max		
	-	-	30	Volt	Outputs are protected against inductive loads and short circuits.
	-	-	0.5	Amp	

Power supply	Min	Typ	Max		
	8	-	34	VDC	
Unit Active with GSM/GPS off		80		mA	At 12 VDC supply voltage. .
Unit in Sleep with GSM/GPS off		20		mA	
Unit in Powerdown		0.9		mA	
Unit Active with GSM on		90	330	mA	
Unit Active with GPS on		160		mA	
Unit Active with GSM/GPS on.		170	420	mA	

Protection	IP54			The unit contains the following external connections: • SUB-D9F for connection of GPS-Smartantenna and for programming the unit. • SUB-D15M for power and digital and analog I/O. • SMA-Female for GSM antenna.
External dimensions	W 120 x H 110 x D 30 mm			
Storage temperature	-40	+90	ºC	
Operating temperature	-25	+55	ºC	
Approvals	EN-50081-1 Emission EN-61000-6-2 Immunity			Unit is CE approved $\quad$ C E

Technical data subject to change

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