

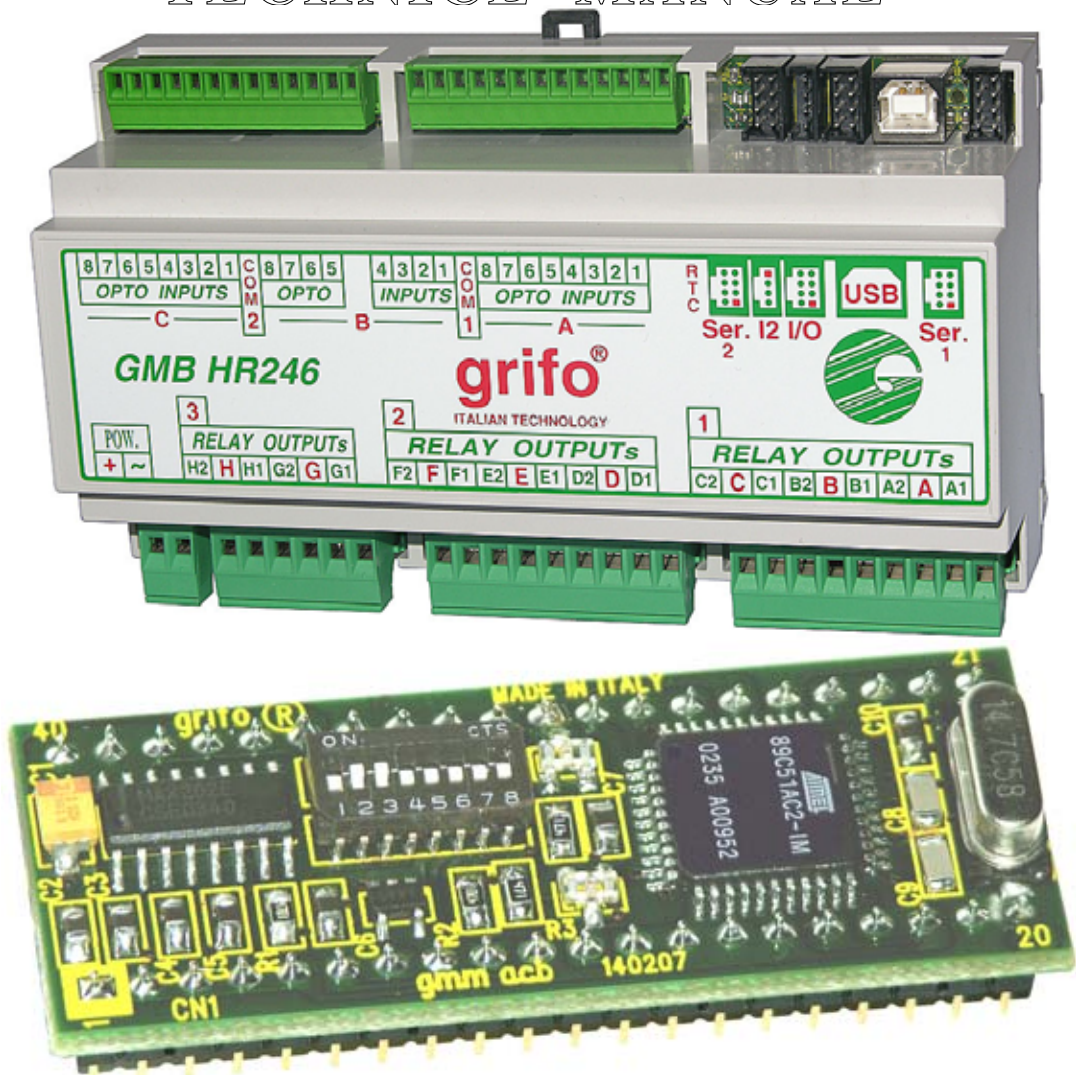
# GMB HR246

grifo® Mini BLOCK Housing, 24 Opto Input, 16 Relay Outputs

# GMM ACB

grifo® Mini Module Atmel AT 89C51AC2

## TECHNICAL MANUAL



**grifo®**

ITALIAN TECHNOLOGY

Via dell' Artigiano, 8/6  
40016 San Giorgio di Piano  
(Bologna) ITALY

E-mail: [grifo@grifo.it](mailto:grifo@grifo.it)

<http://www.grifo.it>

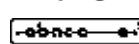
<http://www.grifo.com>

Tel. +39 051 892.052 (r.a.) FAX: +39 051 893.661



GMB HR246+GMM ACB

Rel. 5.00 Edition 21 August 2011

 GPC®, grifo®, are trade marks of grifo®



# GMB HR246

grifo® Mini BLOCK Housing, 24 Opto Input, 16 Relay Outputs

# GMM ACB

grifo® Mini Module Atmel AT 89C51AC2

## TECHNICAL MANUAL

Couple between interface board of **Digital Block GMB HR246** series and **Mini Modules** with **8051 Core** with **40 pins GMM ACB**, able to manage application that involves both **Digital**, **Analog Signals** and line **Communication**.

**grifo®**

ITALIAN TECHNOLOGY

Via dell' Artigiano, 8/6  
40016 San Giorgio di Piano  
(Bologna) ITALY

E-mail: grifo@grifo.it

<http://www.grifo.it>

<http://www.grifo.com>

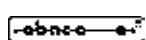
Tel. +39 051 892.052 (r.a.) FAX: +39 051 893.661



GMB HR246+GMM ACB

Rel. 5.00

Edition 21 August 2011



, GPC®, grifo®, are trade marks of grifo®

## DOCUMENTATION COPYRIGHT BY grifo®, ALL RIGHTS RESERVED

No part of this document may be reproduced, transmitted, transcribed, stored in a retrieval system, or translated into any language or computer language, in any form or by any means, either electronic, mechanical, magnetic, optical, chemical, manual, or otherwise, without the prior written consent of grifo®.

### IMPORTANT

Although all the information contained herein have been carefully verified, grifo® assumes no responsibility for errors that might appear in this document, or for damage to things or persons resulting from technical errors, omission and improper use of this manual and of the related software and hardware.

grifo® reserves the right to change the contents and form of this document, as well as the features and specification of its products at any time, without prior notice, to obtain always the best product.

For specific informations on the components mounted on the card, please refer to the Data Book of the builder or second sources.

### SYMBOLS DESCRIPTION

In the manual could appear the following symbols:



Attention: Generic danger

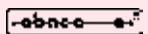


Attention: High voltage



Attention: ESD sensitive device

### Trade Marks

, GPC®, grifo® : are trade marks of grifo®.  
Other Product and Company names listed, are trade marks of their respective companies.

# GENERAL INDEX

COUPLE RESOURCES ..... 1

COUPLE CONNECTIONS ..... 1

# INDICE DELLE FIGURE

FIGURE 1: CONNECTIONI TABLE (1 OF 7) .....	2
FIGURE 2: CONNECTIONI TABLE (2 OF 7) .....	3
FIGURE 3: CONNECTIONI TABLE (3 OF 7) .....	4
FIGURE 4: CONNECTIONI TABLE (4 OF 7) .....	5
FIGURE 5: CONNECTIONI TABLE (5 OF 7) .....	6
FIGURE 6: CONNECTIONI TABLE (6 OF 7) .....	7
FIGURE 7: CONNECTIONI TABLE (7 OF 7) .....	8

## COUPLE RESOURCES

The **GMB HR246 + GMM ACB** couple has the following resources:

<b>Relay Outputs:</b>	. . . . .	<b>24</b>
<b>Optocoupled Inputs:</b>	. . . . .	<b>16</b>
<b>Optocoupled Inputs Type:</b>	. . . . .	<b>NPN , PNP, Powered</b>
<b>Multifunction Signals I/O TTL, A/D, PWM, CAN, etc.:</b>	. . . . .	<b>6</b>
<b>Analog Input (0÷Vfs, 0÷4*Vfs):</b>	. . . . .	<b>1</b>
<b>Max. Value Voltage of A/D Converter (Vfs):</b>	. . . . .	<b>2,5 V o 10,0 V</b>
<b>Serial Line in RS 232:</b>	. . . . .	<b>1</b>
<b>Serial Line in TTL:</b>	. . . . .	<b>1</b>
<b>Serial Line in RS 422:</b>	. . . . .	<b>1</b>
<b>Serial Line in RS 485:</b>	. . . . .	<b>1</b>
<b>Serial Line in Current Loop:</b>	. . . . .	<b>1</b>
<b>Serial Line in I2C BUS:</b>	. . . . .	<b>YES, Firmware</b>
<b>CAN Interface:</b>	. . . . .	<b>NO</b>
<b>USB Interface:</b>	. . . . .	<b>NO</b>
<b>Real Time Clock:</b>	. . . . .	<b>NO</b>

It is important to note that the previous list shows the maximum available resources and some of these ones are not usable in the same time, as described in following figures.

## COUPLE CONNECTIONS

In the following tables are reported connections of all user available signals on **GMB HR246** related to **GMM ACB Mini Module**. With these connections the user can manage all available resources either by hardware and by software.

When a more detailed documentation is required (connection diagrams, signals location on connectors, power supply, jumpers configuration ,software management, etc.) please, see technical manuals of the two modules contained in the couple.

In the tables are present the following abbreviations and references:

N.C. = Not Connected

N.M. = Not Mounted

\*1 = to configure according to the performed connection.

GMM HR246 Connector Pin	GMM HR246 Signal Name	GMM HR246 Configuration	ZC1 Pin	GMM ACB Pin	GMM ACB Configuration	GMM ACB Signal Name	Use on GMM ACB
<b>CN1: Connector for Optocoupled Digital Inputs - A, B Group</b>							
CN1.1	IN1-A	-	32	32	-	P1.1	-
CN1.2	IN2-A	-	31	31	-	P1.2	-
CN1.3	IN3-A	-	25	25	-	P3.2, INT0	-
CN1.4	IN4-A	-	24	24	-	P3.3, INT1	-
CN1.5	IN5-A	-	23	23	-	P3.4, T0	-
CN1.6	IN6-A	-	22	22	-	P3.5, T1	-
CN1.7	IN7-A	-	21	21	-	P3.6	-
CN1.8	IN8-A	-	19	19	-	P3.7	-
CN1.9	COM1	-	-	-	-	-	-
CN1.10	IN1-B	-	1	1	-	P0.0	-
CN1.11	IN2-B	-	2	2	-	P0.1	-
CN1.12	IN3-B	-	3	3	-	P0.2	-
CN1.13	IN4-B	-	4	4	-	P0.3	-

FIGURE 1: CONNECTION TABLE (1 OF 7)



GMB HR246 Connector Pin	GMB HR246 Signal Name	GMB HR246 Configuration	ZC1 Pin	GMM ACB Pin	GMM ACB Configuration	GMM ACB Signal Name	Use on GMM ACB
<b>CN2: Connector for Optocoupled Digital Inputs - C, D Group</b>							
CN2.1	IN5-B	-	35	35	-	P0.4	-
CN2.2	IN6-B	-	36	36	-	P0.4	-
CN2.3	IN7-B	-	37	37	-	P0.6	-
CN2.4	IN8-B	-	38	38	-	P0.7	-
CN2.5	COM2	-	-	-	-	-	-
CN2.6	IN1-C	-	12 ; 13	12 ; 13	-	P0	-
CN2.7	IN2-C	-	12 ; 13	12 ; 13	-	P1	-
CN2.8	IN3-C	-	12 ; 13	12 ; 13	-	P2	-
CN2.9	IN4-C	-	12 ; 13	12 ; 13	-	P3	-
CN2.10	IN5-C	-	12 ; 13	12 ; 13	-	P4	-
CN2.11	IN6-C	-	12 ; 13	12 ; 13	-	P5	-
CN2.12	IN7-C	-	12 ; 13	12 ; 13	-	P6	-
CN2.13	IN8-C	-	12 ; 13	12 ; 13	-	P7	-
<b>CN3: Connector for Relays Outputs - A, B, C Group</b>							
CN3.1	OUT A1	-	29	29	-	P1.4	-
CN3.2	COMMON A	-	-	-	-	-	-
CN3.3	OUT A2	-	28	28	-	P1.5	-
CN3.4	OUT B1	-	27	27	-	P1.6	-
CN3.5	COMMON B	-	-	-	-	-	-
CN3.6	OUT B2	-	26	26	-	P1.7	-
CN3.7	OUT C1	J8 in 2-3	14	14	-	P4.0	-
CN3.8	COMMON C	-	-	-	-	-	-
CN3.9	OUT C2	J7 in 2-3	15	15	-	P4.1	-

FIGURE 2: CONNECTION TABLE (2 OF 7)



GMB HR246 Connector Pin	GMB HR246 Signal Name	GMB HR246 Configuration	ZC1 Pin	GMM ACB Pin	GMM ACB Configuration	GMM ACB Signal Name	Use on GMM ACB
<b>CN4: Connector for Relays Outputs - D, E, F Group</b>							
CN4.1	OUT D1	-	18	18	-	P2.2	-
CN4.2	COMMON D	-	-	-	-	-	-
CN4.3	OUT D2	J6 in 4-5	16	16	-	P2.4	-
CN4.4	OUT E1	-	12 ; 13	12 ; 13	-	PR.0	-
CN4.5	COMMON E	-	-	-	-	-	-
CN4.6	OUT E2	-	12 ; 13	12 ; 13	-	PR.1	-
CN4.7	OUT F1	-	12 ; 13	12 ; 13	-	PR.2	-
CN4.8	COMMON F	-	-	-	-	-	-
CN4.9	OUT F2	-	12 ; 13	12 ; 13	-	PR.3	-
<b>CN5: Connector for Relays Outputs - G, H Group</b>							
CN5.1	OUT G1	-	12 ; 13	12 ; 13	-	PR.4	-
CN5.2	COMMON G	-	-	-	-	-	-
CN5.3	OUT G2	-	12 ; 13	12 ; 13	-	PR.5	-
CN5.4	OUT H1	-	12 ; 13	12 ; 13	-	PR.6	-
CN5.5	COMMON H	-	-	-	-	-	-
CN5.6	OUT H2	-	12 ; 13	12 ; 13	-	PR.7	-
<b>CN6: Connector for Power Supply</b>							
CN6.1	Vac or +Vdc	-	-	-	-	-	-
CN6.2	GND	-	20	20	-	GND	-

FIGURE 3: CONNECTION TABLE (3 OF 7)

GMM HR246 Connector Pin	GMM HR246 Signal Name	GMM HR246 Configuration	ZC1 Pin	GMM ACB Pin	GMM ACB Configuration	GMM ACB Signal Name	Use on GMM ACB	
<b>CN7: Connector for Asynchronous Serial Line 1 (Principal Line) in RS 232</b>								
CN7.1	+5 Vdc	-	34	34	-	+Vdc POW	-	
CN7.2	Vopto A	-	-	-	-	-	-	
CN7.3	TX RS232	J18, J20 N.C. J17, J19, J21 in 2-3 IC21, 25=N.M. IC22, 26=N.M.	10	10	Dip Switch DSW 1-2 = ON DSW 1-4 = ON DSW 1-3 = OFF DSW 1-5 = OFF	PDO , TXD RS232 , TXD TTL	-	
CN7.4	-		-	-			-	
CN7.5	RX RS232		9	9			PD1 , RXD RS232 , RXD TTL	-
CN7.6	-		-	-			-	-
CN7.7	GND	-	20	20	-	GND	-	
CN7.8	Vopto B	-	-	-	-	-	-	
<b>CN7: Connector for Asynchronous Serial Line 1 (Principal Line) in TTL</b>								
CN7.1	+5 Vdc	-	34	34	-	+Vdc POW	-	
CN7.2	Vopto A	-	-	-	-	-	-	
CN7.3	TX TTL	J18, J20 N.C. J17, J19, J21 in 2-3 IC21, 25=N.M. IC22, 26=N.M.	10	10	Dip Switch DSW 1-2 = OFF DSW 1-4 = OFF DSW 1-3 = ON DSW 1-5 = ON	PDO , TXD RS232 , TXD TTL	-	
CN7.4	-		-	-			-	
CN7.5	RX TTL		9	9			PD1 , RXD RS232 , RXD TTL	-
CN7.6	-		-	-			-	-
CN7.7	GND	-	20	20	-	GND	-	
CN7.8	Vopto B	-	-	-	-	-	-	

FIGURE 4: CONNECTION TABLE (4 OF 7)



GMB HR246 Connector Pin	GMB HR246 Signal Name	GMB HR246 Configuration	ZC1 Pin	GMM ACB Zero Pin	GMM ACB Zero Configuration	GMM ACB Zero Signal Name	Use on GMM ACB Zero
<b>CN7: Connector for Asynchronous Serial Line 1 (Principal Line) in RS 422</b>							
CN7.1	+5 Vdc	-	34	34	-	+Vdc POW	-
CN7.2	Vopto A	-	-	-	-	-	-
CN7.3	TX- RS422	J18, J20 *1	10	10	Dip Switch DSW 1-2 = OFF	PDO , TXD RS232 , TXD TTL	-
CN7.4	TX+ RS422	J17, J19, J21 in 1-2 J22 in 2-3	9	9	DSW 1-4 = OFF	PD1 , RXD RS232 , RXD TTL	-
CN7.5	RX+ RS422	IC21, 25=MAX 483			DSW 1-3 = ON		
CN7.6	RX- RS422	IC22, 26=N.M			DSW 1-5 = ON		
CN7.7	GND	-	20	20	-	GND	-
CN7.8	Vopto B	-	-	-	-	-	-
-	DIR	J6 in 1-2	17	17	-	PD7 , OC2	-
<b>CN7: Connector for Asynchronous Serial Line 1 (Principal Line) in RS 485</b>							
CN7.1	+5 Vdc	-	34	34	-	+Vdc POW	-
CN7.2	Vopto A	-	-	-	-	-	-
CN7.3	-	J18, J20 *1	10	10	Dip Switch DSW 1-2 = OFF	PDO , TXD RS232 , TXD TTL	-
CN7.4	-	J17, J19, J21 in 1-2 J22 in 1-2	9	9	DSW 1-4 = OFF	PD1 , RXD RS232 , RXD TTL	-
CN7.5	RXTX+ RS485	IC21=MAX 483			DSW 1-3 = ON		
CN7.6	RXTX- RS485	IC22, 25, 26=N.M			DSW 1-5 = ON		
CN7.7	GND	-	20	20	-	GND	-
CN7.8	Vopto B	-	-	-	-	-	-
-	DIR	J6 in 1-2	17	17	-	PD7 , OC2	-

FIGURE 5: CONNECTION TABLE (5 OF 7)

GMB HR246 Connector Pin	GMB HR246 Signal Name	GMB HR246 Configuration	ZC1 Pin	GMM ACB Pin	GMM ACB Configuration	GMM ACB Signal Name	Use on GMM ACB
<b>CN7: Connector for Asynchronous Serial Line 1 (Principal Line) in Current Loop</b>							
CN7.1	+5 Vdc	-	34	34	-	+Vdc POW	-
CN7.2	Vopto A	-	-	-	-	-	-
CN7.3	TX- C.L.	J18, J20 N.C. J17, J19, J21 in 1-2 IC21, 25=N.M. IC22=HP 4200 IC26=HP 4100	10	10	Dip Switch DSW 1-2 = OFF DSW 1-4 = OFF DSW 1-3 = ON DSW 1-5 = ON	PDO , TXD RS232 , TXD TTL	-
CN7.4	TX+ C.L.						
CN7.5	RX+ C.L.						
CN7.6	RX- C.L.						
CN7.7	GND	-	20	20	-	GND	-
CN7.8	Vopto B	-	-	-	-	-	-
<b>CN8: Connector for USB -&gt; NOT AVAILABLE</b>							
CN8.1	-	-	-	-	-	-	-
CN8.2	USBL	-	12	12	-	-	-
CN8.3	USBH	-	13	13	-	-	-
CN8.4	GND	-	20	20	-	GND	-
<b>CN9: Connector for Multifunction Signals I/O TTL, A/D, PWM, CAN, etc.</b>							
CN9.1	+5 Vdc	-	34	34	-	+Vdc POW	-
CN9.2	MM PIN 5	-	5	5	-	P2.6	-
CN9.3	MM PIN 14	J8 in 1-2 ; J10 in 2-3	14	14	-	P4.0	-
CN9.4	/INTRTC	-	11	11	-	P2.5	-
CN9.5	MM PIN 15	J7 in 1-2 ; J9 in 2-3	15	15	-	P4.1	-
CN9.6	MM PIN 30 , PWM	-	30	30	-	P1.3 - PWM	-
CN9.7	GND	-	20	20	-	GND	-
CN9.8	MM PIN 33 , A/D	J5 in 1-2 J5 select. range	33	33	-	P1.0 , AN0	-

FIGURE 6: CONNECTION TABLE (6 OF 7)



GMB HR246 Connector Pin	GMB HR246 Signal Name	GMB HR246 Configuration	ZC1 Pin	GMM ACB Pin	GMM ACB Configuration	GMM ACB Signal Name	Use on GMM ACB
<b>CN10: Connector for I2C BUS Line</b>							
CN10.1	+5 Vdc	-	34	34	-	+Vdc POW	-
CN10.2	SCL	-	12	12	-	P2.0 , SCL	I2C BUS
CN10.3	SDA	-	13	13	-	P2.1 , SDA	I2C BUS
CN10.4	GND	-	20	20	-	GND	-
<b>CN11: Connector for Asynchronous Serial Line 2 (Secondary Line) -&gt; NOT AVAILABLE</b>							
CN11.1	+5 Vdc	-	34	34	-	+Vdc POW	-
CN11.2	Vopto A	-	-	-	-	-	-
CN11.3	TX TTL	-	10	10	-	-	-
CN11.4	-	-	-	-	-	-	-
CN11.5	RX TTL	-	9	9	-	-	-
CN11.6	-	-	-	-	-	-	-
CN11.7	GND	-	20	20	-	GND	-
CN11.8	Vopto B	-	-	-	-	-	-

FIGURE 7: CONNECTION TABLE (7 OF 7)