WOODWARD



MotoHawk Control Solutions

GCM-0565-024-0602-F

General Control Module (Part No. 1751-6336)

Description

Presenting the GCM-0565-024-0602-F engine control module from Woodward's new MotoHawk Control Solutions product line. These rugged embedded controllers are capable of operating in harsh automotive, marine, and off-highway applications. Hundreds of successful industrial applications prove the capability of this module. Based on a proven microprocessor, the GCM-0565-024-0602-F is capable of delivering complex control strategies. The CAN 2.0B datalink ensures interoperability with other system components.

The GCM-0565-024-0602-F is part of the ControlCore[®] family of embedded control systems. MotoHawk Control Solutions' ControlCore operating system, MotoHawk[®] code-generation product, and MotoHawk's suite of development tools enable rapid development of complex control systems.

IMPORTANT

Woodward does not warranty these ECMs based on information supplied in this datasheet, but only with an express and specific production supply agreement based on customer's operating mode. Information in this datasheet is subject to change without prior notice. Please contact MotoHawk Control Solutions sales for more information.

- Microprocessor: MPC565, 56 MHz
- Memory: 1M Internal Flash, 256M NAND Flash, 36K Internal RAM, 512K SRAM, 8K EEPROM
- Operating Voltage: 6-32 Vdc
- Operating Temperature: -40 to +65 °C (in benchmark marine engine application)
- Sealed connectors available, operable to 10 ft (3 m) submerged
- Inputs: 6 Analog

•

- Outputs: 5 V 100 mA Transducer Power 5 V 400 mA USB Power (on Host Channel)
- Datalinks: 2 CAN 2.0B Channels 1 RS-232 Channel 2 USB - 2.0 Channels (1 Host, 1 Client, Full-Speed Channels - 12 Mbit/s max.)
- Other Features:
 RTC (clock) with
 External Battery
 Backup
 USB Power Detection
 (on Client Channel)





3-Communications	
3.1 CAN1+, CAN1- (6, 19) Note: CAN1 may also be used for programming the unit.	CAN 2.0B, Standard or Extended ID, 1 MBd.
3.2 CAN2+, CAN2- (7, 20)	CAN 2.0B, Standard or Extended ID, 1 MBd.
3.3 USB1+, USB1- (9, 10)	USB Client port.
3.4 USB2+, USB2- (23, 24)	USB Host port.
3.5 RXD, TXD (22, 21)	RS-232, programmable baud rate up to 115200. 8 bits, no parity, 1 stop bit.







4.2 Connector Pinouts		4.2.1 Resource by Connector Pin P/N: HARN-ISDL-001-D0			
Pin # ECM	ControlCore Resource Name	Function Name Notes		Wire Number Color Code	
1	XDRG	Transducer Ground	Ground Return for Transducers	1 Black/Orange	
2	AN1	Analog Input	51K Pull Down	2 Pink/Black	
3	AN2	Analog Input	51K Pull Down	3 White/Dark Blue	
4	AN3	Analog Input	51K Pull Down	7 Pink/Orange	
5	AN4	Analog Input	51K Pull Down	8 Pink/Purple	
6	CAN1+	Serial Communications		4 White/Dark Blue	
7	CAN2+	Serial Communications		5 White/Dark Blue	
8	USB2_PWR	Power for USB Device	5 V, 400 mA	6 Red	
9	USB1+	Serial Communications		9 Green/White	
10	USB1-	Serial Communications		10 White/Green	
11	USB1_PWR	Detection Input		11 Red/Pink	
12	AN5	Analog Input	51K Pull Down	12 Pink/Red	
13	KEY_SW	Module Wake Up	Switched Power	13 Purple	
14	SGND	System Ground	Battery Ground	14 Black	
15	AN6	Analog Input	51K Pull Down	15 Pink/Yellow	
16	BATT	Module Power		16 White/Orange	
17	BKUP_BATT	Back Up Battery Input	Powers MPC565 RTC	17 Red/Black	
18	XDRP	Transducer Power	5 V, 100 mA	18 Purple/ Yellow	
19	CAN1-	Serial Communications		19 Dark Blue	
20	CAN2-	Serial Communications		20 Green/Blue	
21	RS232_TXD	Serial Communications		21 Black/ Orange	
22	RS232_RXD	Serial Communications		22 Black/Red	
23	USB2+	Serial Communications		23 Green	
24	USB2-	Serial Communications		24 White	

4.2 Connector Pinouts			4.2.1 Resource by Name		
ControlCore Resource Name	Function Name	Notes	Wire Number Color Code	Pin # ECM	
AN1	Analog Input	51K Pull Down	2 Pink/Black	2	
AN2	Analog Input	51K Pull Down	3 White/Dark Blue	3	
AN3	Analog Input	51K Pull Down	7 Pink/Orange	4	
AN4	Analog Input	51K Pull Down	8 Pink/Purple	5	
AN5	Analog Input	51K Pull Down	12 Pink/Red	12	
AN6	Analog Input	51K Pull Down	15 Pink/Yellow	15	
BATT	Module Power		16 White/Orange	16	
BKUP_BATT	Back Up Battery Input	Powers MPC565 RTC	17 Red/Black	17	
CAN1-	Serial Communications	Terminating Resistor Required	19 Dark Blue	19	
CAN1+	Serial Communications		4 White/Dark Blue	6	
CAN2-	Serial Communications		20 Green/Blue	20	
CAN2+	Serial Communications		5 White/Dark Blue	7	
KEY_SW	Module Wake Up	Switched Power	13 Purple	13	
RS232_RXD	Serial Communications		22 Black/Red	22	
RS232_TXD	Serial Communications		21 Black/ Orange	21	
SGND	System Ground	Battery Ground	14 Black	14	
USB1-	Serial Communications		10 White/Green	10	
USB1_PWR	Detection Input		11 Red/Pink	11	
USB1+	Serial Communications		9 Green/White	9	
USB2-	Serial Communications		24 White	24	
USB2_PWR	Power for USB Device	5 V, 400 mA	6 Red	8	
USB2+	Serial Communications		23 Green	23	
XDRG	Transducer Ground	Ground Return for Transducers	1 Black/Orange	1	
XDRP	Transducer Power	5 V, 100 mA	18 Purple/ Yellow	18	



6-Environmental						
6.1 General	The GCM-0565-024-0602-F is designed to meet automotive industry standards for passenger compartment environmental requirements for 24-volt systems, and also meets marine industry environmental requirements. Validation tests included extreme operating temperatures (–40 to +60 °C), thermal shock, humidity, salt spray, salt fog, immersion, fluid resistance, mechanical shock, vibration, and EMC. It is the responsibility of the application engineer to ensure that the application does not exceed the demonstrated capabilities of the unit; vibration or thermal. It may be necessary to perform additional tests to validate the unit in the application.					
		F _n (Hz)	PSD _n (g²/Hz)	Slope (db/Oct)	Area (g²)	
6.2 Vibration:		15	0.0905	0.00	0.91	
The GCM-0565-024-0602-F is tested		25	0.0905	-2.90	8.95	
right:		1000	0.0026			
Electrical and mechanical isolation is via a bushing, grommet, and washer, as shown below.	Acceleration PSD (g^2/Hz) Acceleration PSD (g^2/Hz) 10.0 10		PSD vs. Fre 100 Frequ	equency	1000	10000
6.3 Transient Power Spike Res	stance	±200 Vdc				

7-Boot / Reprogram the Module

Errors in configuration, logic and/or other programming made during program development for this module (via .srz file), can cause a persistent loss of CAN communications with the module under development.

If this happens, apply the boot key to force the module into reboot mode, reloading the module with functional program code (a known, valid .srz file) in order to allow resumption of module communication. Follow the steps listed in this section.

Refer to diagram below for connections (boot cable HARNADPT004). See Section 1.3 for using a boot key.

WARNING

Remove the ECU from direct control connections before performing the reboot procedure, as outputs are set to defaults or undefined states, with unpredictable and possibly hazardous results if applied.

NOTICE

Remove other ECUs from CANbus

for this procedure.

- 1. Connect the module for programming via necessary cables, CAN converter, etc.
- 2. Select a known, valid .srz file for programming.
- 3. With key off, disconnect battery power from module. With module power off, initiate programming of the module using MotoTune[®].
- 4. When the "Looking for an ECU" prompt appears in the dialog, reconnect Battery, and then turn key on, to power up and "wake-up" ECU.

The module must "wake-up" (KEYSW on) with the boot key or cable connections applied as described in order to initiate a reboot and to absorb the selected program.



WOODWARD

PO Box 1519, Fort Collins CO, USA 80522-1519 1000 East Drake Road, Fort Collins CO 80525 Tel.: +1 (970) 482-5811 • Fax: +1 (970) 498-3058 mcsinfo@woodward.com • mcs.woodward.com www.woodward.com

Distributors & Service

Woodward has an international network of distributors and service facilities. For your nearest representative, call the Fort Collins plant or see the Worldwide Directory on our website.

This document is distributed for informational purposes only. It is not to be construed as creating or becoming part of any Woodward Governor Company contractual or warranty obligation unless expressly stated in a written sales contract.

