Motors

Automation

Energy

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Coatings

PUMP GENIUS

PG HMI with Integral PLC - Installation Manual

Driving efficiency and sustainability

This product requires an RS485 communication module for each Variable Frequency Drive (VFD) in the system, please verify the proper communications module is available for, or already installed on each VFD.

The following steps outline the installation and startup of Pump Genius.

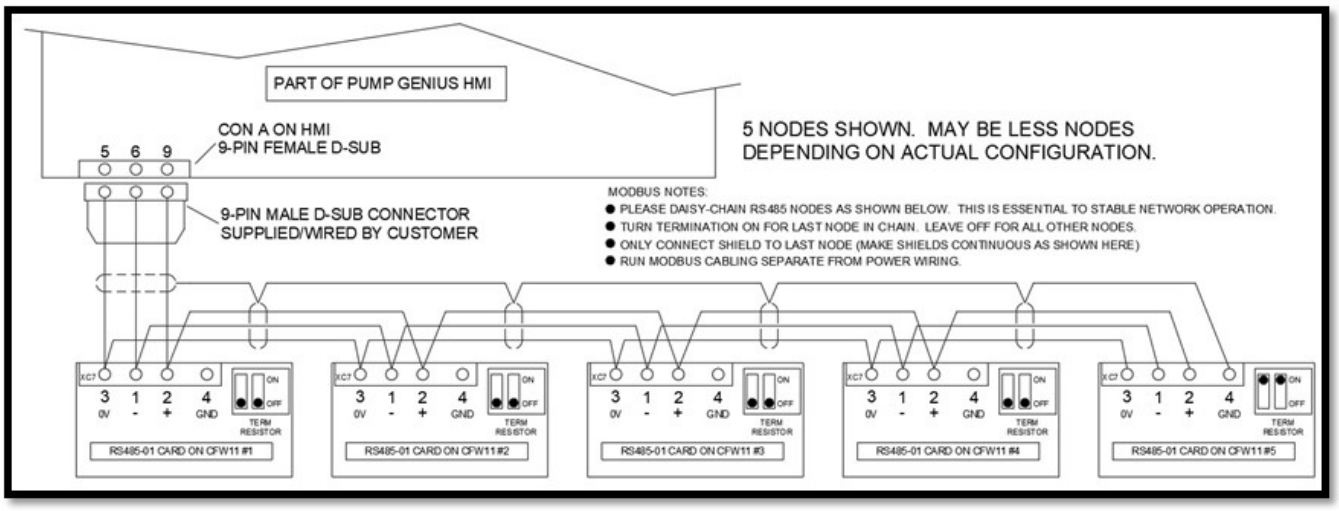
1. If not already completed, install RS485 communication modules on all drives. The table below lists the appropriate communications modules depending on the VFD model.

VFD Model Number	**RS485 Communications Module (Catalog Number)***
CFW11	RS485-01
CFW500	CFW500-IOS
CFW300	CFW300-CRS
CFW320	CFW320-CRS

*The communications modules listed in the table above are arguably the simplest option available for each model VFD to work with Pump Genius. For a complete list of all RS485 options available, based on VFD model, please refer to the WEG Automation Catalog.

2. Wire the RS485 network. The figure below shows five VFD communications modules wired into the network. Switches S1:1 and S1:2 should be turned on for the last RS485 module (VFD furthest from the Pump Genius HMI). Turning on switches S1:1 and S1:2 properly terminates the RS485 network.

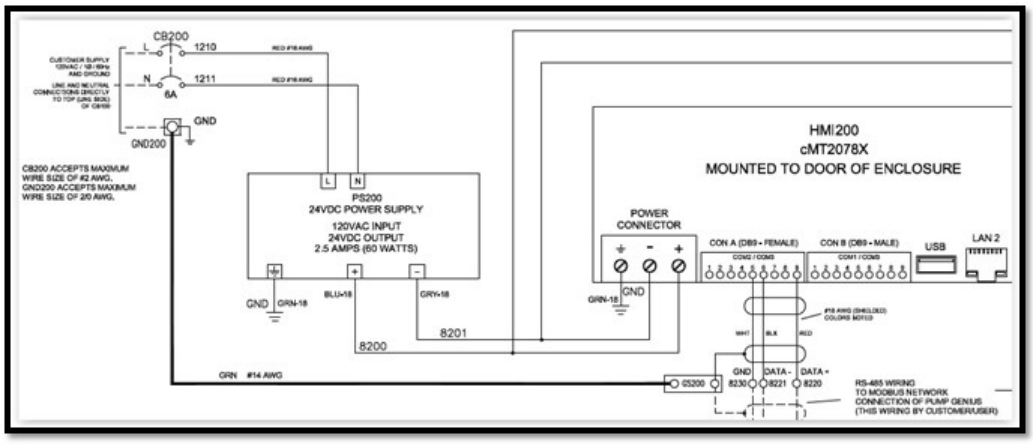
The above figure is typical for an installation using the CFW11 and RS485-01 communications modules. Wiring details for the other VFD models/communications adapters are provided with the communications adapter purchased.



3. There are 2 options for I/O used with Pump Genius. The first option is to use the analog inputs on the VFDs at Modbus addresses 1 and 2 for the process variable. If using a single process sensor, it would be wired to the Analog 1 input of the VFD at Modbus address 1. If dual process sensors are used they would be wired to analog input 1 of the VFDs at Modbus addresses 1 and 2. For wiring information on using the VFD analog inputs, please refer to wiring diagrams in the appropriate VFD user manual. If the option to use the VFD analog inputs is selected, there is no provision for use of discrete inputs with the Pump Genius HMI.

   If using the VFD analog input(s) for the process sensors, the HMI can be supplied mounted in an enclosure or supplied by itself. The option of supplying the HMI only requires the end user to provide the mounting and 24VDC power for the HMI, specifications for the HMI are presented near the end of this document.

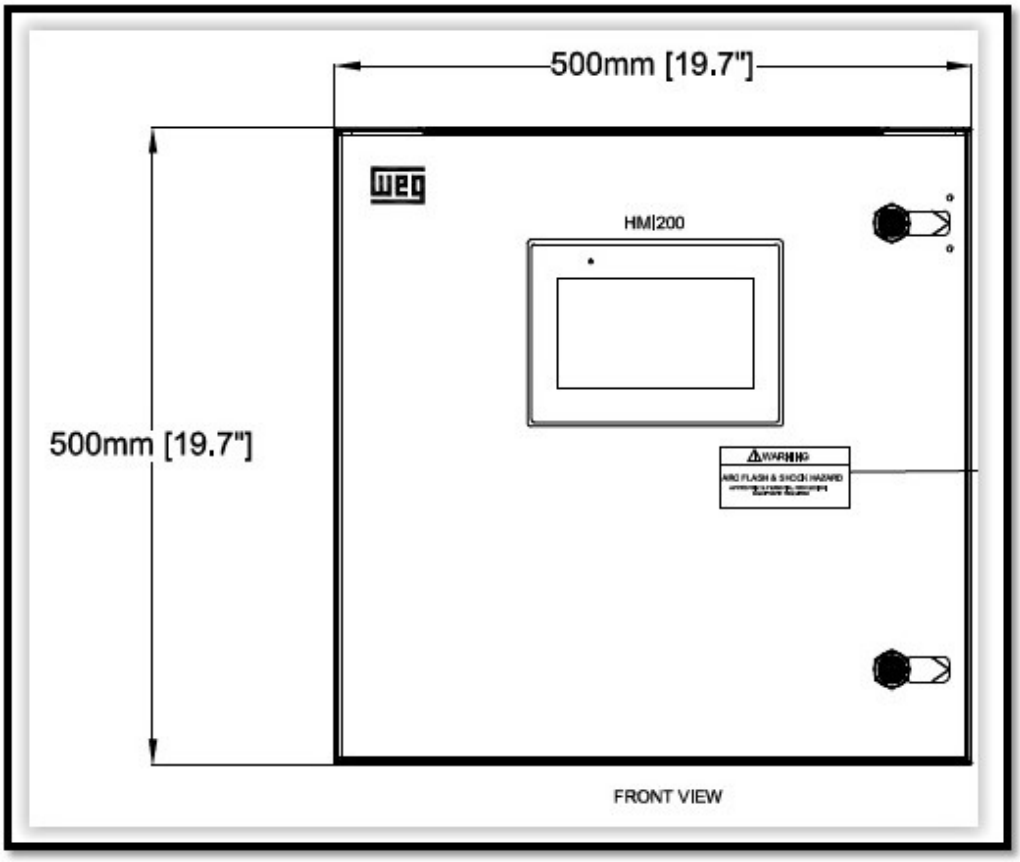
If using the VFD analog input(s) and the HMI in an enclosure from WEG, the end user has to mount the enclosure, provide 120vac power and wire the Modbus network. The figure below illustrates the customer required connections to the WEG supplied HMI panel, if using VFD analog inputs.



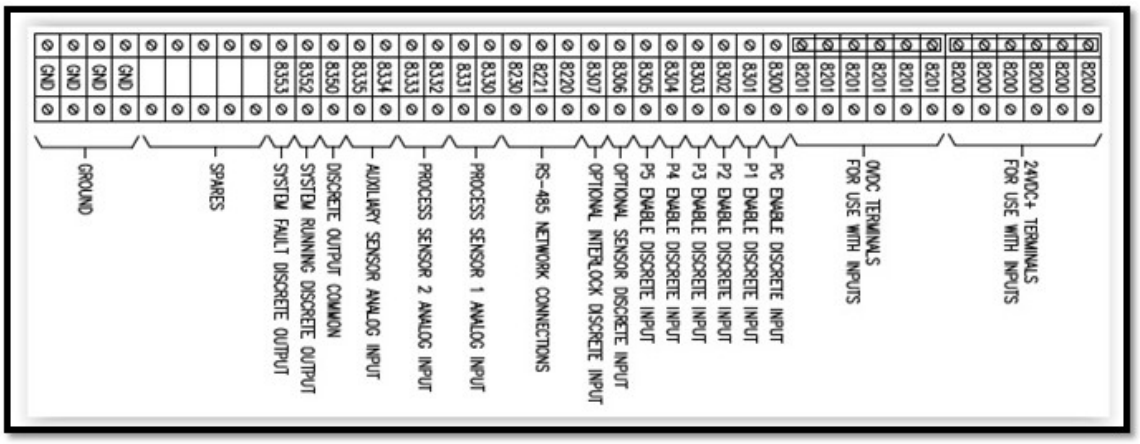
If the option to use the VFD analog input(s) and the WEG enclosure is chosen, drawing 10011491102 is supplied with the enclosure. Note: drawing 10011491102 includes wiring details for many of the options using VFD analog inputs.

If the option to use VFD analog input(s) is selected, proceed to step 5.

4. The second I/O option for use with Pump Genius is to use the analog and discrete I/O available from WEG. The WEG provided I/O is supplied in an enclosure, the HMI is mounted in the door of the enclosure. The following two figures show the exterior of the enclosure and the terminal block layout. WEG drawing 1011471915 is supplied with the enclosure.



The end user is responsible for supplying 120VAC/60Hz, 6A minimum to the enclosure.



Please refer to the PG Description of Operation for the function of the signals indicated on the above figure. At least some of the I/O illustrated in the figure above may be optional and dependent on the needs of a particular installation.

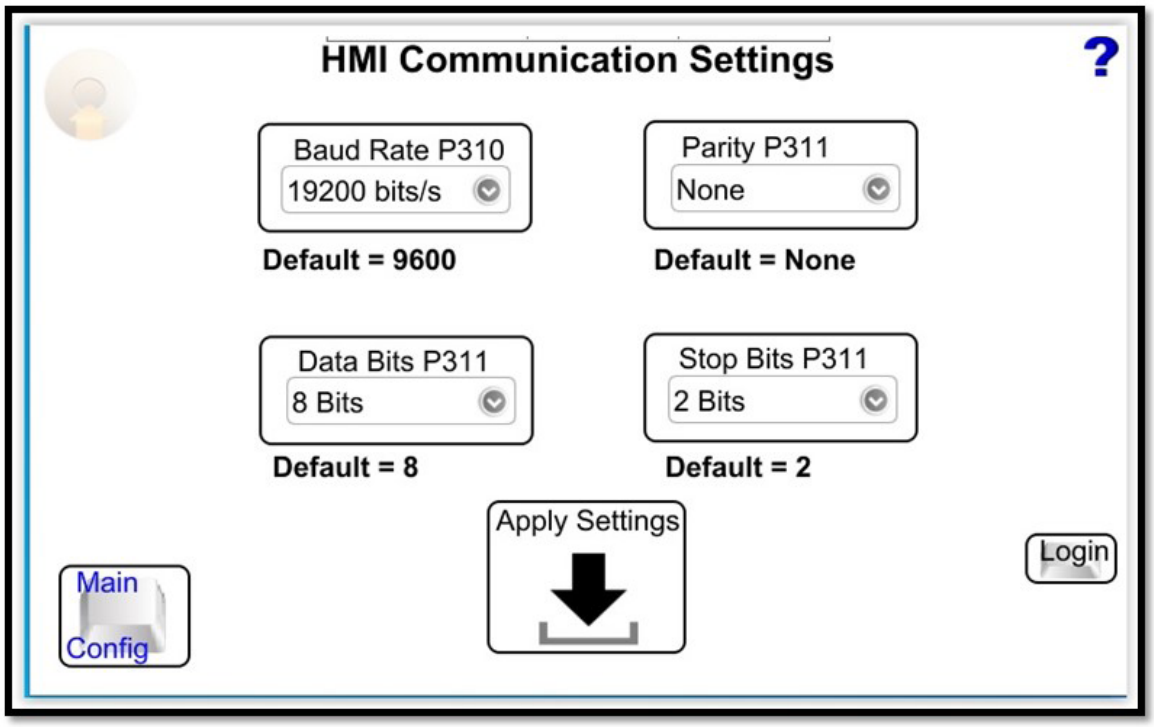
The PG Enable and individual pump enable switches are mounted externally to the WEG supplied PG enclosure and are end user provided. If any functions are not used, they can be disabled in the system configuration wizard, please refer to the PG Description of Operation.

If only one process sensor is used, it has to be wired to the “Process Sensor 1 Analog Input” to work properly with the PG program. Process sensor(s) is not provided with the PG enclosure.

The System Running and System Fault discrete outputs are available for remote indication. Current of each output should be limited to 1 Amp. The discrete outputs are relay outputs and power for the discrete output devices is provided by the end user. Any remote indication device, beacon, light, etc., is end user provided.

Specifications for the I/O modules are at the end of this document.

5. If the number of drives in the system is not selected, the screen below is the first screen displayed when the HMI finishes booting up. The Default values depend on the VFD module used. The important point is the VFD settings match the HMI settings. Recommended Baud Rate is 19200 bits/s.



6. Change/verify Modbus communication parameters on each VFD in the system. The Pump Genius HMI is using the RS485 network/Modbus RTU protocol to communicate with the VFDs.

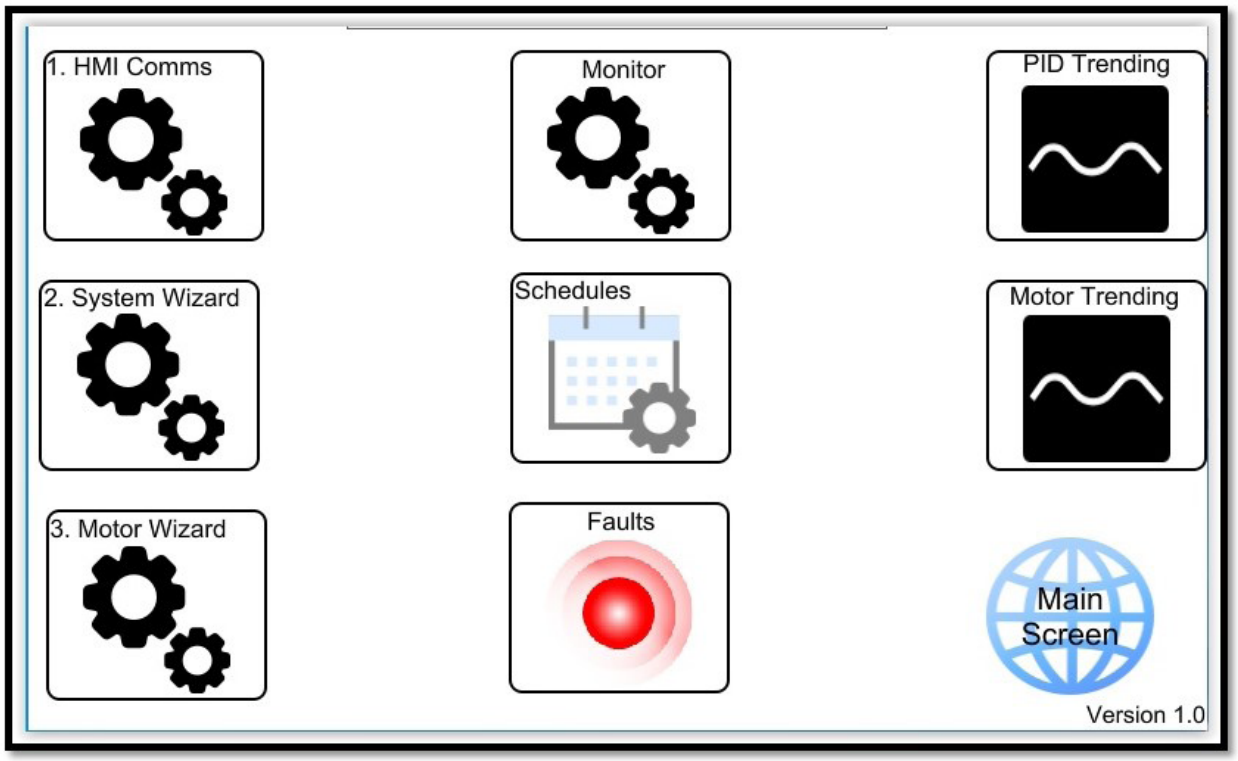
   a. P308 = Modbus address, 1 through the number of drives, maximum of 5. The Modbus addresses must be sequential, with no gaps from 1 through the maximum number of drives, up to five.
   b. P310 = Adjust HMI Baud Rate to Match. Recommend 19.2 K.
   c. P311 = 8 bits, no parity, 2 stop bits, or adjust HMI Data Bits / Parity /Stop Bits to match
   d. P312 = Modbus RTU (or Modbus RTU slave depending on VFD model).
   Manually adjust the above parameters at each drive, if necessary.

7. Connect the Pump Genius HMI to the Modbus Network, using CON A on the HMI.

Pin#	COM 3	Function
5	GND	Signal Ground
6	Data -	Data Negative
9	Data +	Data Positive

8. Power Cycle the Drives.

9. Navigate to the Main Config screen shown below.



Select the System Wizard and follow the steps to configure Pump Genius. For a complete description of each step in the Wizard, please refer to the Description of Operation for Pump Genius.

The initial login for the system is “WEG/WEG”.

10. After completing the steps in the System Wizard, complete the steps in the Motor Wizard. For a complete description of the steps in the Motor Wizard, please refer to the Pump Genius Description of operation.

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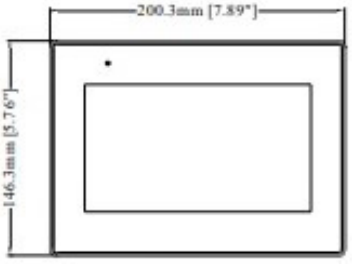
HMI Specification

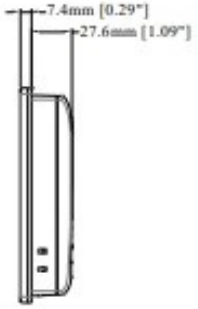
Display	Display	7" TFT
	Resolution	800 x 480
	Brightness (cd/m²)	400
	Contrast Ratio	800:1
	Backlight Type	LED
	Backlight Life Time	>30,000 hrs.
	Colors	16.7M
	LCD Viewing Angle (T/B/R/L)	80/60/80/80
	Pixel Pitch (mm)	0.1926(H) x 0.179(V)
Touch Panel	Type	4-wire Resistive Type
	Accuracy	Active Area Length(X)±2%, Width(Y)±2%
Memory	Flash	4 GB
	RAM	1 GB
Processor		Quad-core RISC
I/O Port	SD Card Slot	N/A
	USB Host	USB 2.0 x 1
	USB Client	N/A
	Ethernet	LAN 1: 10/100 Base-T x 1 LAN 2: 10/100 Base-T x 1
	COM Port	Con.A: COM2 RS-485 2W/4W, COM3 RS-485 2W Con.B: COM1 RS-232 4W, COM3 RS-232 2W* MPI is not supported.
	RS-485 Dual Isolation	N/A
	CAN Bus	N/A
	HDMI	N/A
	Audio Output	N/A
RTC		Built-in
Power	Input Power	24±20%VDC
	Power Isolation	Built-in
	Power Consumption	820mA@24VDC
	Voltage Resistance	500VAC (1 min.)
	Isolation Resistance	Exceed 50MΩ at 500VDC
Specification	PCB Coating	Yes
	Enclosure	Plastic
	Dimensions WxHxD	200.3 x 146.3 x 35.0 mm
	Panel Cutout	192 x 138 mm
	Weight	Approx. 0.6 kg
	Mount	Panel mount
Environment	Protection Structure	UL Type 4X (indoor use only) / NEMA4 / IP66 Compliant Front Panel
	Storage Temperature	-20° ~ 60°C (-4° ~ 140°F)
	Operating Temperature	0° ~ 55°C (32° ~ 131°F)
	Relative Humidity	10% ~ 90% (non-condensing)
	Vibration Endurance	10 to 25Hz (X, Y, Z direction 2G 30 minutes)
Certificate	CE	CE marked
	UL	cULus Listed
Software	EasyBuilder Pro	V6.05.02 or later versions
	Weincloud	EasyAccess 2.0 (Optional), Dashboard (Optional)
	CODESYS®	Optional

Dimensions

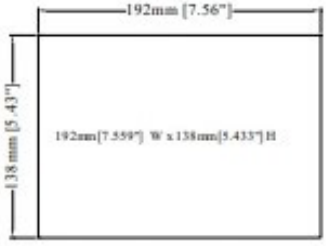
Top View



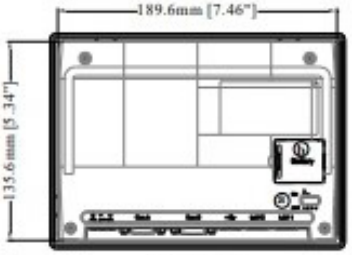
Front View



Side View



Cutout Dimensions



Rear View

Bottom View

a	DIP SW	***e***	Con.B: COM1 RS-232 4W, COM3 RS-232 2W
b	Battery	***f***	USB Host Port
c	Power Connector	***g***	LAN 2
d	Con.A: COM2 RS-485 2W/4W, COM3 RS-485 2W,	***h***	LAN 1

Pin Assignment:

Con.B: COM1 / COM3 [RS232] 9 Pin, Male, D-sub

PIN#	COM1 [RS232]4W	COM3 [RS232]2W
1		
2	RxD	
3	TxD	
4		
5	GND	
6		
7	RTS	TxD
8	CTS	RxD
9	GND	

Con.A: COM2 / COM3 [RS485], 9 Pin, Female, D-sub

PIN#	COM2 [RS485]2W	COM2 [RS485]4W	COM3 [RS485]2W
1	Data-	Rx-	
2	Data+	Rx+	
3		Tx-	
4		Tx+	
5	GND		
6			Data-
7			
8			
9			Data+

All data subject to change without notice

Communications Coupler/Discrete I/O Specifications

Communication Interface Specifications			
No. of Ports	1		
Data Transfer Rate	10/100 Mbps		
Data Transfer Medium	4 x 2 twisted pair copper cable; category 3 (10 Mbps), category 5 (100 Mbps)		
Distance Between Stations	100 m between hub/switch and Bus Coupler or between Bus Coupler and Bus Coupler		
Protocol	Modbus TCP Server, EtherNet/IP adapter		
Max. Number of TCP/IP Connections	8 connections		
Network to Logic Isolation	Yes		
Digital Output			
Total Number of Outputs	16		
Output Logic	Relay		
Output Voltage	250VAC/30VDC		
Output Current	2A per channel (Max 8A)		
Response Time	10ms		
Isolation	Yes, electromagnetic isolation		
Digital Input			
Total Number of Inputs	24		
Isolation	Yes, optical isolation		
General Input	Number of Inputs		20
	Input Logic		Sink or Source
	Logic 1 Input Voltage		15~28 VDC
	Logic 0 Input Voltage		0~5 VDC
	Response Time	OFF->ON	5 ms
		ON->OFF	1 ms
	Input Impedance		5.6 KΩ
High-speed Input	Number of Inputs		4
	Input Logic		SINK INPUT (PNP)*
	Logic 1 Input Voltage		15~28 VDC
	Logic 0 Input Voltage		0~5 VDC
	Max. Input Frequency		20KHz
	Input Impedance		3 KΩ
Expansion I/O Module			
Number of Bus Terminals	Depends on Power Consumption (Please see section 5 in this datasheet) The maximum allowable number of iR modules is 16 modules.		
Digital Input Point	Max. 224 (Including 24 built-in points and the max. allowable number is 248 points.)		
Digital Output Point	Max. 112 (Including 16 built-in points and the max. allowable number is 128 points.)		
Analog Input Channel	Max. 64		
Analog Output Channel	Max. 64		
Indicators			
ENET	Green		Device Status Indicator
	Red		Device Error Indicator
IO	Green		Module Status Indicator
	Red		Module Error Indicator
General Specification			
Power	Power Supply		24 VDC (-15%/+20%)
	Power Dissipation		Nominal 255mA@24VDC
	Current for-Internal Bus		Max 2A@5VDC

Analog Input Specifications

Input Range	-10V~10V 、 -20mA~20mA				
Conversion Time	2ms/Channel				
Isolation	500 VDC：(Analog / Digital)				
Data Format	-10~10V	-5~5V	1~5V	-20~20mA	4~20mA
	±32000	±32000	0~32000	±32000	0~32000
Resolution	0.312mV	0.156mV	0.156mV	0.625uA	0.625uA
	16 bit	16 bit	15 bit	16 bit	15 bit
Input Impedance	1MΩ			250 Ω	
Maximum Voltage / Current Range	-15~15V			-25~25mA	
Overflow Range	-10.12~10.12V			-20.24~20.24mA	
Diagnose	Supply Voltage Wire break (1~5V & 4~20mA) Overflow/underflow				
Accuracy	± 0.2 % Full Scale@25°C ± 0.3 % Full Scale@0° ~ 55°C				

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WEG's scope of solutions is not limited to the products and solutions presented in this brochure.
Contact WEG for information on additional products and solutions.

For WEG's worldwide operations visit our website

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Duluth, GA

US.PG.HMI/PLC. Installation Manual

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