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HM-1756-WM-1Ch
Strain Gage Input Module

User Manual

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Force Measurement and Control Solutions

IMPORTANT USER INFORMATION

Solid state equipment has operational characteristics differing from those of electromechanical equipment. “Safety Guidelines for the Application, Installation and Maintenance of Solid State Controls” (Allen-Bradley Publication SGI-1.1) describes some important differences between solid state equipment and hard-wired electromechanical devices. Because of this difference, and also because of the wide variety of uses for solid state equipment, all persons responsible for applying this equipment must satisfy themselves that each intended application of this equipment is acceptable.

In no event will the Helm Instrument Company be responsible or liable for indirect or consequential damages resulting from the use or application of this equipment.

The examples and diagrams in this manual are included solely for illustrative purposes. Because of the many variables and requirements associated with any particular installation, the Helm Instrument Company cannot assume responsibility or liability for actual use based on the examples and diagrams.

No patent liability is assumed by Helm Instrument Company with respect to use of information, circuits, equipment, or software described in this manual.

Throughout this manual we use notes to make you aware of safety considerations.

PREFACE

Read this preface to become familiar with the rest of this manual. This preface covers the following topics:

- Who should use this manual
- The purpose of this manual
- Terms and abbreviations
- Conventions used in this manual
- Helm Instrument support

WHO SHOULD USE

Use this manual if you are responsible for the design, installation, programming, or maintenance of an automation control system that uses Allen-Bradley small logic controllers.

You should have a basic understanding of ControlLogix products. You should understand electronic process control and be able to interpret the ladder logic instructions required to generate the electronic signals that control your application. If you do not, contact your local Helm representative for the proper training before using this product.

PURPOSE OF THIS MANUAL

This manual is a learning and reference guide for the Helm ControlLogix Strain Gage Input Module. It contains the information you need to install, wire, and use the module.

TECHNIQUES USED IN THIS MANUAL

The following conventions are used throughout this manual:

- Bulleted lists such as this one provide information, not procedural steps.
- Numbered lists provide sequential steps or hierarchical information.

PRODUCT SUPPORT

Contact your Helm representative or call Helm direct at 419-893-4356:

- sales and order support
- product technical training
- warranty support
- support service agreements

Your Questions or Comments on this Manual

If you have any suggestions for how this manual could be made more useful to you, please send us your ideas.

HARDWARE OVERVIEW

The HM-1756-SGI-PLM module fits into any single-slot. It is a Class 1 module (uses eight input words and eight output words).

The module can accept 2 channels of strain gage input. Two 700 ohm gages may be paralleled to one channel.

Module configuration requires manual and user programmable setup. The module receives and stores digitally converted analog data into its image table for retrieval.

HM-1756-SGI-WM SPECIFICATIONS

Backplane Power Consumption	**24V @ 84.99mA 5V @ 40mA**
Type of input	**Strain Gage (350 ohm, 700 ohm)**
Input Impedance	**10k**
Display Resolution	**Up to .0025% of full scale**
Overall Module Accuracy	**.01% of full scale**
Number of Channels	**1 (isolated)**
A/D Conversion Method	**Successive Approximation - 16 bit**
Normal Mode Rejection: (between +/- input)	**116DB CMRR**
Amplifier Bandwidth	**200 kHz**
Calibration	**Software Selectable**
Isolation	**500 VDC continuous between inputs and chassis ground, and between input and backplane**
Operating Temperatures	**0°C to 60°C (32°F to 140°F)**
Hazardous Environment Classification	**Class 1 Division 2 Hazardous Environment**

GETTING STARTED

This chapter can help you to get started using the Helm Strain Gage module. The procedures included here assume that you have a basic understanding of ControlLogix products. You should understand electronic process control and be able to interpret the ladder logic instructions required to generate the electronic signals that control your application.

Because it is a start-up guide, this chapter does not contain detailed explanations about the procedures listed. It does, however, reference other chapters in this book where you can get more information about applying the procedures described in each step. It also references other documentation that may be helpful if you are unfamiliar with programming techniques or system installation requirements. If you have any questions or are unfamiliar with the terms used or concepts presented in the procedural steps, always read the referenced chapters and other recommended documentation before trying to apply the information.

This chapter will:

- tell you what equipment you need
- explain how to install and wire the module
- show you how to calibrate the module

REQUIRED TOOLS AND EQUIPMENT

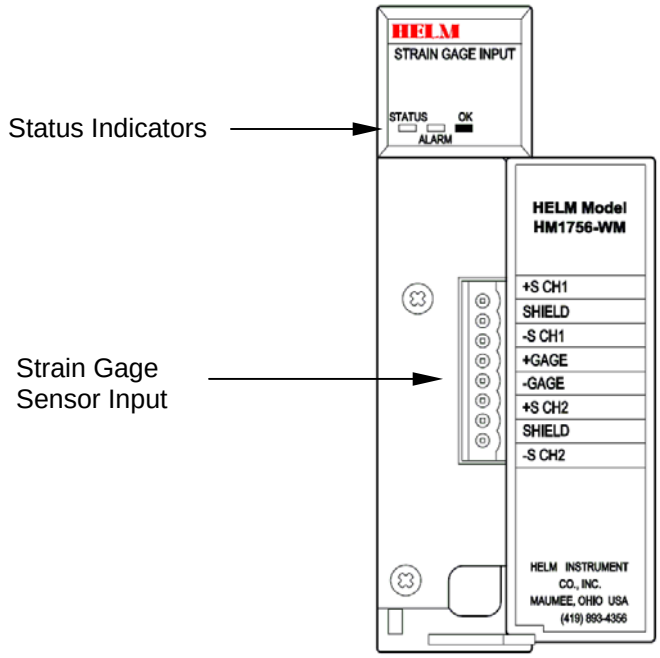
Have the following tools and equipment ready:

- small blade screwdriver
- programming equipment (All programming examples shown in this manual demonstrate the use of Rockwell RSLogix 5000 Software).

SYSTEM OPERATION

The module communicates to the controller through the serial backplane interface and receives +5Vdc and +24Vdc power from the controller power supply through the backplane. No external power supply is required. You may install as many modules in your system as the power supply can support.

FRONT PANEL



Status / Alarm Indicator Lights
Status light is on (green) when module is in Run Mode.
Status light is off when module is in Calibrate Mode.

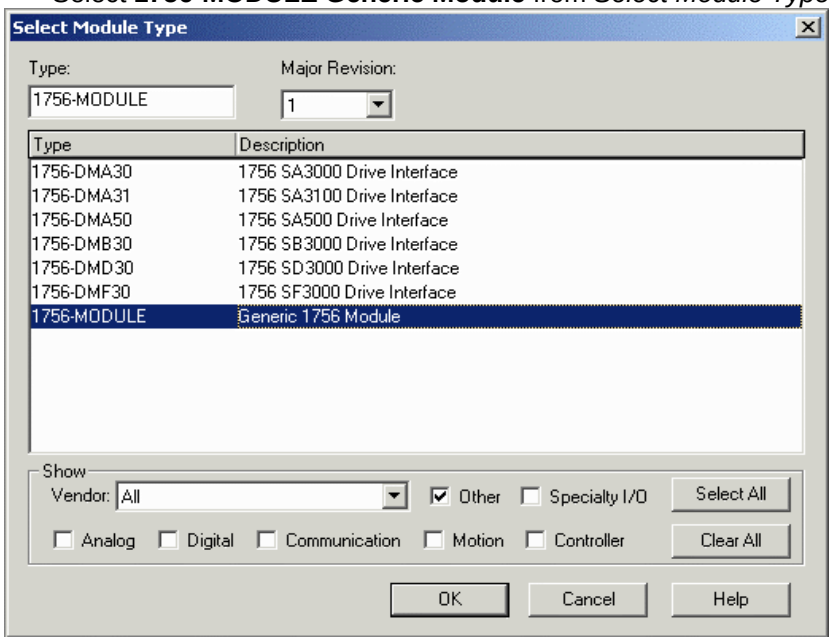
OK light is on (green) when PLC communication is OK.

MODULE I/O CONFIGURATION

This shows the preliminary setup and operation required before the module can function in a 1756 I/O system using RSLogix5000

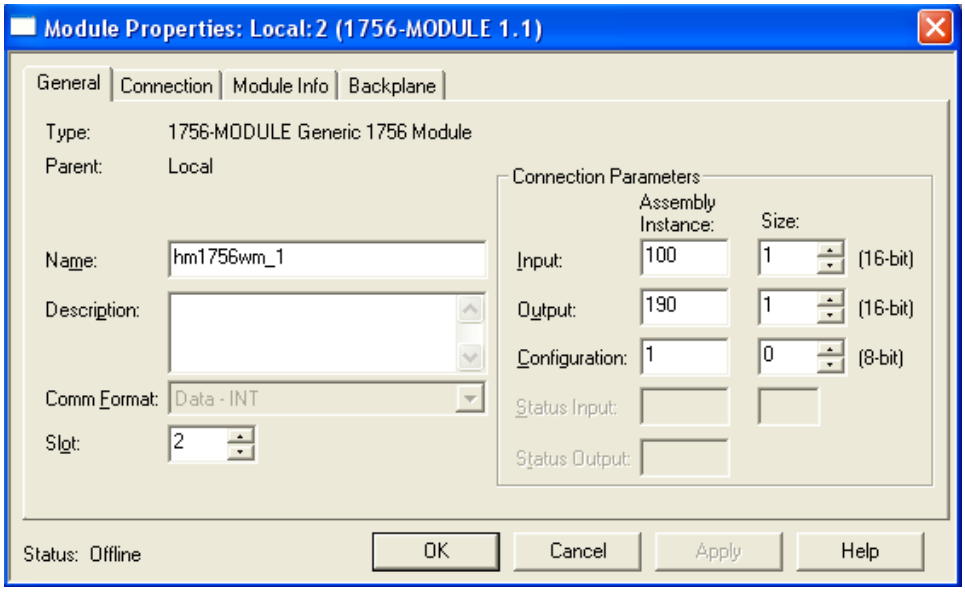
Adding Module to I/O Configuration

Select **1756-MODULE Generic Module** from *Select Module Type* window



Configuration Module's Properties

From the Controller Organizer, right click on the added module and open up Module Properties windows

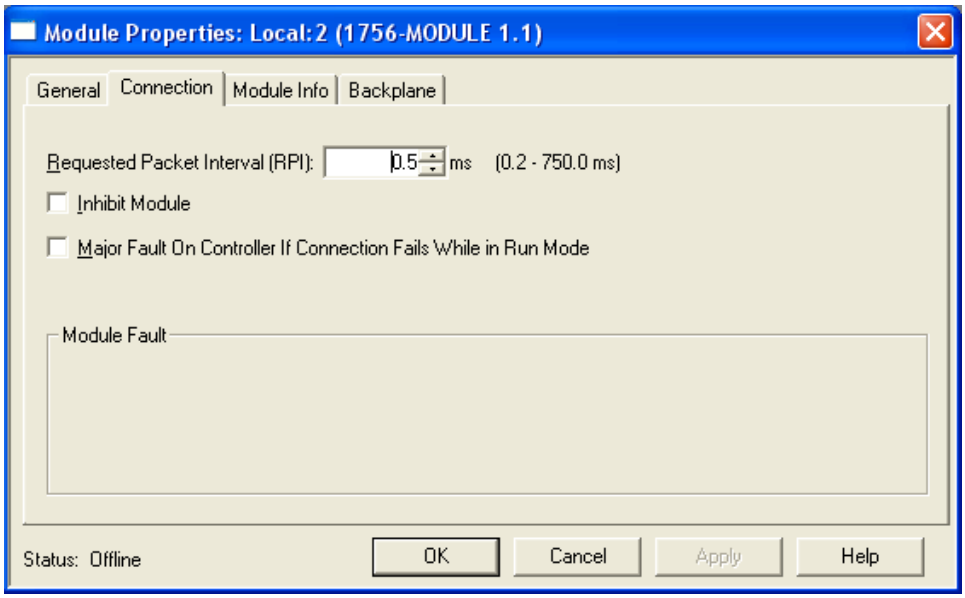


Type in a name for the module, select a slot number

General: Connection Parameters

	Assembly Instance	Size
Input	100	1
Output	190	1
Configuration	1	0

Connection: Requested Packet Interval (RPI): 0.5ms



MODULE INPUT /OUTPUT

LOCAL INPUT DATA TAGS

Data Tags Local:x.I	Data Type	Bit	Description
.Data[0]	INT	-	Ch1 Weight value

Ch1 Weight Value: Displays the actual weigh read from sensor as an signed word (-32768 to 32767).

LOCAL OUTPUT IMAGE TAGS

Data Tags Local:x.O	Data Type	Bit	Description
.Data[0]	Bit	0	Run Bit
	Bit	1	Up Course Zero Balance by 1
	Bit	2	Down Course Zero Balance by 1
	Bit	3	Save to EEPROM
	Bit	4	Ch1 Clear Tare
	Bit	5	Ch1 Set Tare
	Bit	6	Read DA Value

WRITE CONFIG DATA BIT:

Run Mode Bit: When reading or downloading the module's configuration data using **.Data[0].0** and **.Data[0].2**, this bit needs to be at 0. For any other operation, such as reading weigh value, leave the bit at 1.

Up Course Zero Bit: Used to increase the offset range of the A/D for the channel selected.

Down Course Zero Bit: Used to decrease the offset range of the A/D for the channel selected.

Clear Tare Offset Bit: Resets or removes tare value from module for the channel selected.

Set Tare Offset Bit: Sets current weight reading to zero for the channel selected.

Read DA Value: Set this bit to read internal DA value of sensor input. It is used to diagnose for the sensor connected. When the bit is set, the DA read out should be somewhere around 2000 which indicates that the sensor read out is in middle of the Module's input range (0-4098)

MODULE INITAIL SETUP PROCEDURE

You must make the following adjustments for proper operation:

Balance sensor input(s)

Step 1. Balance Sensor Input.

1. Toggle Tare Offset bit to clear any offset value stored in memory.
2. Toggle Up and Down Course Zero bit to set amplifier to low range of A/D (20,000 counts)
3. Toggle Set Tare Offset bit to zero the balance.

APPENDIX A HM-1756 WEIGH 1CH MODULE DATA TAGS

LOCAL INPUT DATA TAGS

Data Tags Local:x.I	Data Type	Bit	Description
.Data[0]	INT	-	Ch1 Weight value

LOCAL OUTPUT IMAGE TAGS

Data Tags Local:x.O	Data Type	Bit	Description
.Data[0]	Bit	0	Run Bit
	Bit	1	Up Course Zero Balance by 1
	Bit	2	Down Course Zero Balance by 1
	Bit	3	Save to EEPROM
	Bit	4	Ch1 Clear Tare
	Bit	5	Ch1 Set Tare
	Bit	6	Read DA Value

APPENDIX B: SYSTEM CONNECTION