Honeywell

UDC2800 Universal Digital Controller

Limit Control Model

Release 110.3

Product Manual

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ABOUT THIS GUIDE

Abstract

This document provides descriptions and procedures for the Installation, Configuration, Operation, and Troubleshooting of your controller.

Revision history

Revision	Date	Document ID	Description
1.0	December 2022	51-52-25-165	Initial release of this document

Special Terms

The following table lists those symbols used in this document to denote certain conditions.

Symbol	Definition
PIE	Process Instrument Explorer
PV	Process Variable
RTD	Resistance Temperature Detector
SP	Setpoint
SPDT	Single-Pole Double-Throw
SPDT	Single-Pole Single-Throw
TC	Thermocouple
TFT	Thin Film Transistor
UDC	Universal Digital Controller

References

The following list identifies all documents that may be sources of reference for material discussed in this publication.

- How to Apply Digital Instrumentation in Severe Electrical Noise Environments: 51-52-05-01

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INTRODUCTION

What's in this section?

The following topics are covered in this section.

In this section:

Overview

Function

UDC2800 Limit Controllers accept input signals from any of several types of external sensors such as Thermocouples (T/Cs) and Resistance Temperature Detectors (RTDs). It conditions these signals, as necessary, to derive the equivalent Process Variable (PV) value that drives various circuits in the controller.

The equivalent PV signal is compared with the Limit control set point and any error signal from the differential amplifier de-energizes the coil of an electromechanical, single-pole, dual-throw (SPDT) limit output relay.

When de-energized, the output relay "Locks Out" and remains that way until the PV input signal drops below the High Limit Set Point or goes above the Low Limit Set Point and the controller is reset manually via the keyboard or from a remote location (Contact Input Option).

The contact of the output relay terminates at the rear terminal of the controller to which you make the appropriate field wiring connections.

A flashing "LIMIT" in the lower display indicates that the output relay is de-energized.

Features

- 90 – 264 Vac or 24 Vac/dc Power Supply
- Input/Output Isolation
- Isolated Auxiliary Current Output / Digital Input
- Modbusâ RS-485 or Ethernet TCP/IP Communications

High Limit Controller

When the PV input signal is below the limit set point, the output relay energizes. If the PV signal exceeds the limit set point, the output relay de-energizes and the flashing "LIMIT" display is turned on.

When the PV signal returns to a value below the limit set point, the controller can be reset manually using the RESET key or Contact Input Option.

Low Limit Controller

When the PV input signal is above the limit set point, the output relay energizes. If the PV signal falls below the limit set point, the output relay de-energizes and the flashing "LIMIT" display is turned on.

When the PV signal returns to a value above the limit set point, the controller can be reset manually using the RESET key or Contact Input Option.

Easy to read displays

The dedicated vacuum fluorescent displays with multi-language prompts make the operator interface easy to read, understand and operate. Programmed sequences of displays assure quick and accurate entry of all configurable parameters.

Easy to operate

Simple keystrokes let you select input and range configuration, set the operating parameters that meet you process control needs now, and change them later to meet new ones.

Mount anywhere

This instrument is intended for industrial control applications. It must be panel mounted with the wiring terminals enclosed within the panel. The instrument is environmentally hardened and, when suitably enclosed, can be mounted anywhere in plant or factory, on the wall, or even on the process machine itself. The front face is NEMA3 and IP55 rated and can be easily upgraded to NEMA4X and IP66 for the most severe hose-down applications. It withstands ambient temperatures up to 55°C (133°F) and resists the effects of vibration and shock.

Operator Interface

Function of Displays

Figure 2-1: Function of Displays
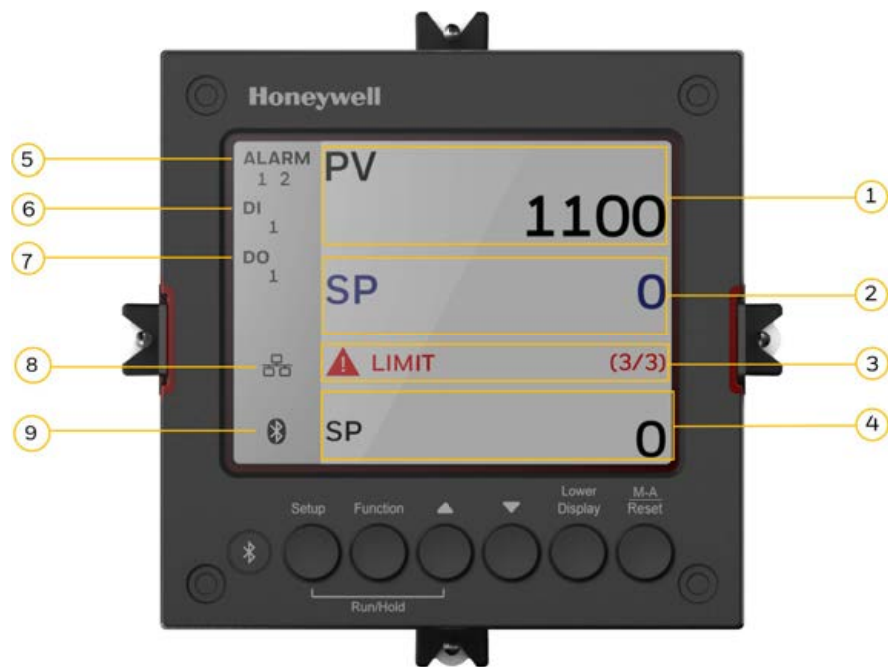
Table 2-1: Function of Displays

Item	Description
1	Upper display shows Process Variable value (maximum 10 digits including decimal point, eg. –XXXX.X). Its unit can be F, C or none.
2	Middle display shows working Setpoint and its value (maximum 10 digits including decimal point, eg. –XXXX.X). SP = Limit Setpoint
3	Diagnostics display shows diagnostic messages. See Diagnostic Messages for more information.
4	Lower display shows key-selected operating parameters such as Setpoints, Input percentage, and Auxiliary output. See Viewing the operating parameters for more information.

Item	Description
5	Alarm 1 and/or Alarm 2 annunciations.
6	Digital Input 1 annunciations.
7	Control Relay 1 annunciations.
8	Modbus, or Ethernet communication status annunciation. Modbus: ⎍ Ethernet: 品 Grey: The function is disabled. White: The function is enabled, but the connection is not established. Blinking: The function is enabled, and the connection is established. Red: The function has errors. No icon: No communication board inserted, or the inserted board does not have communication feature.
9	Bluetooth communication status annunciation. Grey: The function is disabled. White: The function is enabled, but the connection is not established. Blue: The function is enabled, and the connection is established. Blinking: The function is enabled, and the connection is established, and the controller is communicating with a mobile device. Red: The function has errors.

Function of Keys

Figure 2-2: Function of Keys
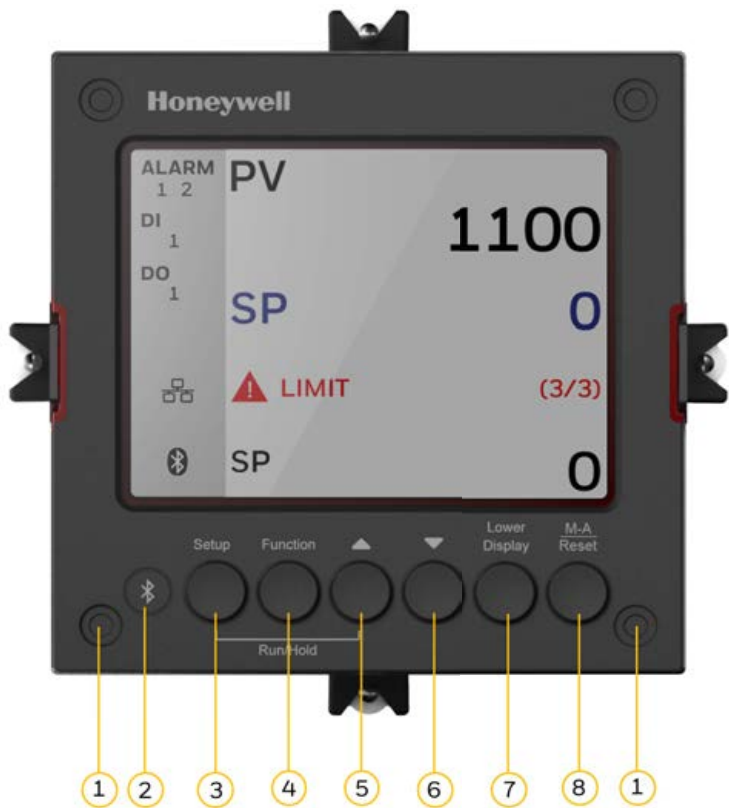
Table 2-2: Function of Keys

Item	Description
1	NEMA4X and IP66 screw attachment (each corner).
2	Bluetooth transmitter Enables to configure and operate controllers from mobility devices (mobile phones and tablet PCs), and download/upload the complete device configuration.
3	Setup key • When in the main screen, press it to enter in the setup screen. • When in the setup screen, it is used to scrolls through the configuration set up groups.

Item	Description
4	Function key Selects functions within each configuration group. • When in the setup screen. The first press will set the focus to the Function Group, and the subsequent presses used to navigate between Function Group and Option Group. • When in the setup screen and the focus in on the Option Group, press it to leave the focus from the Option Group, and immediately save the changes user made on the Option Group.
5	Increment key Increases setpoint or output value. Increases the configuration values or changes functions in Configuration mode groups.
6	Decrement key Decreases setpoint or output value. Decreases the configuration values or changes functions in Configuration mode groups.
7	Lower Display key Returns Controller to normal display from the setup screen. Toggles various operating parameters for display. • When in the main screen, the first press of Lower Display key will set the focus to the Lower Display area of the main screen. The subsequent presses will select the next item from the Lower Display choices list. • When in the setup screen, press it to leave the setup screen and return to the main screen.
8	M-A/Reset Key **MAN-AUTO**: This function is not available on the Limit controller. **RESET**: Reset the Limit Relay.
3+4	When in the main screen, press this combination will enter the display and keypad self-testing mode.
Run/Hold	• Acknowledges a latched alarm 1.
5+6	When editing numerical values in main or setup screen, holding both

Item	Description
	Increment and Decrement keys will cause the current editable digit move one step left.

> **NOTE:** The default password for the UDC device is 1234. It is recommended to change the password after the first login.

Mobile Device App

The controller can be configured via a Honeywell EasySet. Honeywell EasySet is running on a Mobile Device,

The following communication types are available on UDC2800 Limit Controller.

- Bluetooth (Standard / App)

    See Configuration Tool via Bluetooth for more information.

- RS485 (Optional / Software)

    See Modbus Read, Write and Override Parameters plus Exception Codes for more information.

- Ethernet (Optional / Software)

    See Modbus Read, Write and Override Parameters plus Exception Codes for more information.

> **NOTE:** For FM models, Ethernet & 485 communication for the modbus is read only.

Configuration Tool via Bluetooth

Overview

This configuration tool (Honeywell EasySet) lets you configure your instrument on a Mobile Device via Bluetooth. It is available to detect and connect controllers within 3 meters. This app can be installed on IOS 12.0 or higher operating system. See Configuration via Honeywell EasySet for more information.

Figure 2-3: Screen capture of Honeywell EasySet running on a Mobile Device
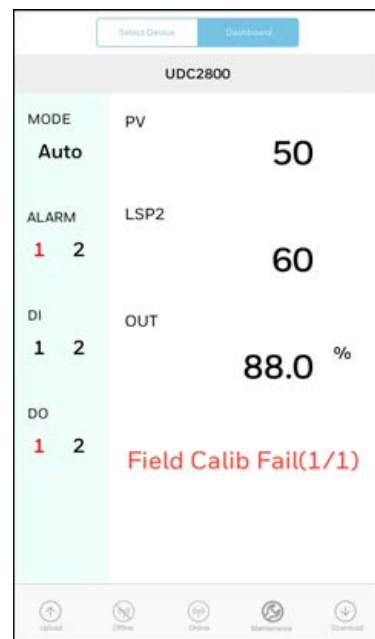
Features

- Create configurations with the application (Honeywell EasySet) running on a Mobile Device.
- Create / edit configurations online or offline and download to controller later.
- This software is available in English.

Bluetooth communications

The Bluetooth connection provides a non-intrusive wireless connection with the instrument and maintains NEMA4X and IP66 integrity.

No need to get access to the back of the controller to communicate with the instrument, no need to take your screwdriver to wire the communication cable, no wiring mistake possible. You can now duplicate an instrument's configuration upload, or download a new configuration in a matter of seconds, just by connecting your mobile device to instrument through Bluetooth.

Connect & Upload: It takes less than 2 seconds to upload configuration from an instrument. You can then save the configuration file onto your mobile device for review modification, or archiving.

Furthermore, the software and app also give you important maintenance information on the controller: instantly, get information on the current operating parameters, digital inputs, and alarm status, identify internal or analog input problems.

Questions: What if I have several controllers on the same panel? How can I be sure I am communicating with the correct one?

Answer: The UDC device's **Bluetooth ID** appears in the communications group on the controller screen, each controller is assigned with different Bluetooth ID's, user can identify same Bluetooth ID in the menu under the device list and connect to the controller.

CE Conformity (Europe)

This product is in conformity with the protection requirements of the following European Council Directives: 2014/35/EU, the Low Voltage Directive, and 2014/30/EU, the EMC Directive. Conformity of this product with any other "CE Mark" Directive(s) shall not be assumed.

Product Classification: Class I: Permanently connected, panel-mounted Industrial Control Equipment with protective earthing (grounding) (EN61010-1).

Enclosure Rating: This controller must be panel-mounted with the rear terminals enclosed within the panel. The front panel of the controller is rated at NEMA4X and IP66 when properly installed.

Installation Category (Overvoltage Category): Category II (EN61010-1)

Pollution Degree: Pollution Degree 2: Normally non-conductive pollution with occasional conductivity caused by condensation. (Ref. IEC 60664-1)

EMC Classification: Group 1, Class A, ISM Equipment (EN61326-1, emissions), Industrial Equipment (EN61326-1, immunity)

Method of EMC Assessment: Technical File (TF)

Declaration of Conformity: 51453655

Deviation from the installation conditions specified in this manual, and the special conditions for CE conformity in Subsection Installation, may invalidate this product's conformity with the Low Voltage and EMC Directives.

> **ATTENTION:** The emission limits of EN61326-1 are designed to provide reasonable protection against harmful interference when this equipment is operated in an industrial environment. Operation of this equipment in a residential area may cause harmful interference. This equipment generates, uses, and can radiate radio frequency energy and may cause interference to radio and television reception when the equipment is used closer than 30 meters (98 feet) to the antenna(e). In special cases, when highly susceptible apparatus is used in close proximity, the user may have to employ additional mitigating measures to further reduce the electromagnetic emissions of this equipment.

> **WARNING:** If this equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

North America

Installation Category (Overvoltage Category): Category II (EN61010-1) Pollution Degree: Pollution Degree 2: Normally non-conductive pollution with occasional conductivity caused by condensation. (Ref. IEC 60664-1)

> **WARNING:** If this equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

FCC

Radio Compliance information: Federal Communications Commission (FCC) contains FCC ID: 2AVFQ-MCUDISP Industry Canada (IC) contains IC: 25762-MCUDISP.

This device complies with Part 15 of the FCC Rules / Innovation, Science and Economic Development Canada's license-exempt RSS (s). Operation is subject to the following two conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication.

Conformément à la réglementation d'Industrie Canada, le présent émetteur radio peut fonctionner avec une antenne d'un type et d'un gain maximal (ou inférieur) approuvé 2 pour l'émetteur par Industrie Canada. Dans le but de réduire les risques de brouillage radioélectrique à l'intention des autres utilisateurs, il faut choisir le type d'antenne et son gain de sorte que la puissance isotrope rayonnée équivalente (p.i.r.e.) ne dépasse pas l'intensité nécessaire à l'établissement d'une communication satisfaisante.

INSTALLATION

What's in this section?

The following topics are covered in this section.

In this section:

Overview

Introduction

Installation of the UDC2800 Limit Controller consists of mounting and wiring the controller according to the instructions given in this section. Read the pre-installation information, check the model number interpretation (Subsection Model Number Interpretation), and become familiar with your model selections, then proceed with installation.

Pre-installation Information

If the controller has not been removed from its shipping carton, inspect the carton for damage then remove the controller.

- Inspect the unit for any obvious shipping damage and report any damage due to transit to the carrier.

- Make sure a bag containing mounting hardware is included in the carton with the controller.

- Check that the model number shown on the inside of the case agrees with what you have ordered.

Condensed Specifications

Honeywell recommends that you review and adhere to the operating limits listed in the table below when you install your controller.

Table 3-1: Condensed Specifications

Items	Specifications
Analog Input	**Accuracy:** ± 0.15% of full scale typical (± 1 digit for display) Can be field calibrated to ± 0.05% of full scale typical 16-bit resolution typical **Sampling Rate:** Input is sampled six times per second **Temperature Stability:** ± 0.01% of Full-Scale span / ˚C change—typical

Items	Specifications
	Input Impedance:
	4-20 Milliampere Input: 250 ohms
	0-10 Volt Input: 200K ohms
	All Others: 10 megohms
	Maximum Lead Wire Resistance:
	Thermocouples: 50 ohms/leg
	100 ohm, 200 ohm and 500 ohm RTD: 100 ohms/leg
	100 ohm Low RTD: 10 ohms/leg
Analog Input Signal Failure Operation	**Burnout Selections:** Upscale, Downscale
	Thermocouple Health: Good, Failing(warning), Failure Imminent or Failed
	Failsafe Output Level: Configurable 0-100% of Output range
Stray Rejection	**Common Mode** *AC (50 or 60 Hz):* 120 dB (with maximum source impedance of 100 ohms) or ± 1 LSB (least significant bit) whichever is greater with line voltage applied. *DC:* 120 dB (with maximum source impedance of 100 ohms) or a ±1 LSB whichever is greater with 120 Vdc applied. *DC (to 1 KHz):* 80 dB (with maximum source of impedance of 100 ohms) or ±1 LSB whichever is greater with 50 Vac applied. **Normal Mode** *AC (50 or 60 Hz):* 60 dB (with 100 % span peak-to-peak maximum)
Digital Input (One) (Optional)	+30 Vdc source for external dry contacts or isolated solid state contacts. Digital Input is isolated from line power, earth ground, analog input, and all outputs except for the Second Current Output.
Controller Output Types	**Electromechanical Relay** SPDT contacts. Both Normally Open and Normally Closed contacts are brought out to the rear terminals. Internally socketed.

Items	Specifications
	Resistive Load: 5 amps @ 120 Vac or 240 Vac or 30 Vdc *Inductive Load (cosj = 0.4):* 3 amps @ 130 Vac or 250 Vac *Inductive Load (L/R = 7 msec):* 3.5 amps @ 30 Vdc *Motor:* 1/6 H.P. > **NOTE:** Applying an external power supply to this output is damages the instrument. *Maximum Sink Current:* 20 mA *Short-circuit current limit:* 100 mA **Open Collector Outputs (One or Two)** Socketed assembly replacing a relay. Two types of loads are supported, resistive load and pilot duty load. Opto-isolated from all other circuits except current output and not from each other. Internally powered @ 28 Vdc (0 mA) ~ 24 Vdc (20 mA). > **NOTE:** Applying an external power supply to this output will damage the instrument. • Maximum Source Current: 20 mA • Overload Protection: 25 mA
Alarm Outputs (Optional)	**One or two SPDT Electromechanical relays:** Up to four setpoints are independently set as high or low alarm, two for each relay. Setpoint can be on Process Variable, Deviation, PV Rate, Communication Shed or Thermocouple Health. A single adjustable hysteresis of 0.0 to 100.0% is provided. **Alarm Relay Contacts Rating:** Resistive Load: 5 amps at 120 Vac or 240 Vac or 30 Vdc
RS422/485 Modbus RTU Communications Interface (Optional)	**Baud Rate:** 4800, 9600,19,200 or 38,400 baud selectable **Data Format:** Floating point or integer **Length of Link:**

Items	Specifications
	• 2000 ft (600 m) max. with Belden 9271 Twinax Cable and 120 ohm termination resistors • 4000 ft. (1200 m) max. with Belden 8227 Twinax Cable and 100 ohm termination resistors **Link Characteristics**: Two-wire, multi-drop Modbus RTU protocol, 15 drops maximum or up to 31 drops for shorter link length.
Ethernet TCP/IP Communications Interface (Optional)	**Type**: 10/100M Base-T **Length of Link**: 330 ft. (100 m) maximum **Link Characteristics**: Four-wire, single drop, five hops maximum **IP Address**: IP Address is 10.0.0.2 as shipped from the Factory **Configuration**: Ethernet parameters are configured via the Front Panel.
RS485 and Ethernet Transaction rates	Host computer must allow a minimum of 20 milliseconds between Read transactions and a minimum of 200 milliseconds between Write transactions.
Bluetooth Communications (Standard)	**Type**: Bluetooth **Length of Link**: 10 ft. (3 m) maximum for mobile devices **Protocol**: BLE 4.2
Digital Displays	TFT LCD: A Thin Film Transistor (TFT) LCD screen is dedicated to display process variable, setpoint, and output. Key selected operating parameters can be shown in the lower area of the screen. Alternate information displayed during configuration mode.
Indicators	Alarm Relay Status (Alarm 1 or 2) Temperature Units (F or C) Active Set Point (■) Control Relay Status (DO 1) Digital Input Status (DI 1)

Items	Specifications
	Communication Status (Bluetooth, Ethernet, and Modbus)
Dimensions	See Overall Dimensions for more information.
Wiring Connections	Screw terminals on the rear of the case. See Wiring Diagrams for more information.
Power Consumption	20 VA maximum (90 to 264 Vac) 15 VA maximum (24 Vac/dc)
Power Inrush Current	10A maximum for 4 ms (under operating conditions), reducing to a maximum of 225 mA (90 to 264 Vac operation) or 750 mA (24 Vac/dc operation) after one second. **CAUTION:** When applying power to more than one instrument, make sure that sufficient power is supplied. Otherwise, the instruments may not start up normally due to voltage drop from the inrush current.
Weight	3 lbs. (1.3 kg)
Isolation (Functional)	**AC Power(100~240VAC):** Electrically isolated from all other inputs and outputs to withstand a HIPOT potential of 3000 Vac for 60 seconds, from earth ground to withstand a HIPOT potential of 1500 Vac for 60 seconds per EN61010-1 and CSA Std C22.2 No.24-15. **DC Power(24VDC/AC):** Electrically isolated from all other inputs and outputs and earth ground to withstand a HIPOT potential of 840 Vac for 60 seconds per EN61010-1 and CSA Std C22.2 No.24-15. **Analog Inputs and Outputs, Digital Inputs and Outputs:** Electrically isolated from all other circuits to withstand a HIPOT potential of 1500 Vac for 60 seconds. **Relay Contacts:** With a working voltage of 125/250 Vac, these are electrically isolated from all other circuits to withstand a HIPOT potential of 3000 Vac for 60 seconds per EN61010-1 and CSA Std C22.2 No.24-15.
Surge Withstand Capability (SWC)	Immunity: ANSI/IEEE C37.90.1, Surge Withstand Capability (SWC) (Formerly IEEE 472). Mains power input and relay contact outputs: 2.5 kV, Common Mode, and Differential

Items	Specifications
	Mode. All other circuits: 1.0 kV, Common Mode, and Differential Mode. The instrument can meet these test levels with no component failures, no reset, and no incorrect outputs.
Radio Frequency Interference (RFI)	Immunity: No effect on performance from a 5 W walkie-talkie operated at 151 or 450 MHz, one meter from the controller.

Environmental and Operating Conditions				
Parameter	Recommended	Rated	Operative Limits	Transportation and Storage
Ambient Temperature	25 ± 3 °C 77 ± 5 °F	0 to 55 °C 32 to 131 °F	0 to 55 °C 32 to 131 °F	−40 to 66 °C −40 to 151 °F
Relative Humidity	10 to 55*	5 to 90*	5 to 90*	5 to 95*
Vibration: Frequency (Hz) Acceleration (g)	 0 0	 1 30	 5 30	 20 30
Mechanical Shock: Acceleration (g) Duration (ms)	 0 0	 1 30	 5 30	 20 30
Line Voltage (Vdc)	+24 ± 1	24	21.6 to 26.4	- -
Line Voltage (Vac) 100 to 240 Vac 24 Vac	 120 ± 1 240 ± 2 24 ± 1	 100 to 240 24	 90 to 264 21.6 to 26.4	 - - - - - -
Frequency (Hz) (For Vac)	50 ± 0.2 60 ± 0.2	50 60	50 ± 2 60 ± 2	- - - -
Altitude	2000 meters			

Environmental and Operating Conditions
* The maximum moisture rating only applies up to 40 °C (104 °F). For higher temperatures, the RH specification is derated to maintain constant moisture content.

Model Number Interpretation

Introduction

Write your controller's model number in the spaces provided below and circle the corresponding items in each table. This information will also be useful when you wire your controller.

UDC2800 Universal Digital Limit Controller Model Selection Guide

The UDC2800 controller packs new powerful features while retaining all the simplicity and flexibility of the industry standard UDC2500 controller including:

- ■ Enhanced Display
- ■ Bluetooth for configuring with Honeywell EasySet
- ■ Ethernet Communications
- ■ Thermocouple Health Monitoring

Instructions

Select the desired key number. The arrow to the right marks the selection available.

Make the desired selections from Tables I through VI using the column below the proper arrow. A dot (•) donates availability.

Key Number	I	II	III	IV	V	VI
_ _ _ _ _ _	_ _	_ _ _	_ _ _	_ _ _	_ _	_

Table I – Specify Control Output and/or Alarms				
Output #1	Current Output (4 to 20 ma, 0 to 20 ma)	C _	•	•
	Electro Mechanical Relay (5 Amp Form C)	E _	•	•
	Open Collector transistor output	T _	•	•
	Dual 2 Amp Relays (Both are Form A) (Heat /Cool Applications)	R _	•	•
Output #2 and Alarm #1 or Alarms 1 and 2	No Additional Outputs or Alarms	_ 0	•	•
	One Alarm Relay Only	_ B	•	•
	E-M Relay (5 Amp Form C) Plus Alarm 1 (5 Amp Form C Relay)	_ E	•	•
	Open Collector Plus Alarm 1 (5 Amp Form C Relay)	_ T	•	•

Table II – Communications and Software				
Communications	None	0 _ _	•	•
	Auxiliary Output/Digital Inputs (1 Aux and 1 DI or 2 DI)	1 _ _	•	•
	RS-485 Modbus Plus Auxiliary Output/Digital Inputs	2 _ _	•	•
	10/100M Base-T Ethernet (Modbus RTU) Plus Auxiliary Output/Digital Inputs	3 _ _	•	•
Software	Limit Controller	_ L _	e	e
	Standard Software	_ S _	•	•
	Standard S /W and Set Point Programming	_ F _	•	•
Future options	None	_ _ 0	•	•

Table III – Input 1 and Input 2				
Input 1 (See Note 1)	TC, RTD, mV, 0-5V, 1-5V, 0-10V	1 _ _	•	•
	TC, RTD, mV, 0-5V, 1-5V, 0-10V, 0-20mA, 4-20mA	2 _ _	•	•
Input 2	None	_ 00	•	•
	TC, RTD, mV, 0-5V, 1-5V, 0-10V	_ 10	•	•
	TC, RTD, mV, 0-5V, 1-5V, 0-10V, 0-20mA, 4-20mA	_ 20	•	•
	Slidewire Input for Position Proportional (Requires 2 Relay Outputs)	_ 40	•	•
	Carbon, Oxygen or Dewpoint (Provides 2 Inputs)	_ 60	•	•
Note 1: Input 1 can be changed in the field using external resistors.				

Table IV – Options				
Approvals (Note 2)	CE (Standard)	0 _ _	•	•
	CE, UL and CSA	1 _ _	•	•
	CE, UL, CSA and FM (Limit controller)	2 _ _	d	d
Tags	None	_ 0 _	•	•
	Stainless Steel Customer ID Tag – 3 lines w/22 characters/line	_ T _	•	•
Future Options	None	_ _ 0	•	•
Note 2: FM certified for Limit controller.				

Table V – Documentation				
Documents	Quick Start Guide – English	0 _	•	•
Certificate	None	_ 0	•	•
	Certificate of Conformance (F3391)	_ C	•	•

Table VI – Extended Warranty				
Extended	None	0	•	•

Warranty	Extended Warranty Additional 1 year	1	•	•
	Extended Warranty Additional 2 years	2	•	•

ORDERING INSTRUCTIONS: These are provided as guidance for ordering such as those listed.

1. Part numbers are provided to facilitate Distributor Stock.

2. Orders may be placed either by model selection or by part number.

3. Part numbers are shown within the model selection tables to assist with compatibility information.

4. Orders placed by model selection are systematically protected against incompatibility.

5. Compatibility assessment is the responsibility of the purchaser for orders placed by part number.

6. Items labeled as N/A are not available via the stocking program and must be ordered by model selection.

RESTRICTIONS

Restriction Letters	Available Only With		Not Available With	
	Table	Selection	Table	Selection
a	I	EE, R_		
b	III	1 _ _		
c	II	_ S _		
d	II	_ L _		
e	III	_00	I	C _, R _

- FM approved units with communication are limited to read only.

- UL listed for regulatory use only.

- CSA listed for regulatory use only.

UDC2800 Universal Digital Controller Supplemental Accessories & Kits

Description		Part Number
Front panel assembly, UDC 2800/2900		50159507-501
TFT-LCD module for UDC2800, CTM320240N01		50152823-501
Power/Output PWA without E-M Relays (90-264 Vac Operation)		51308438-528
Power/Output PWA with E-M Relays (90-264 Vac Operation)		51308438-529
Power/Output PWA with E-M Relays (24 Vac/dc Operation)		51308440-526
Auxiliary Output/Digital Input PWA		51308448-526
Auxiliary Output/Digital Input/RS-422/485 Communications PWA		51308448-527
Auxiliary Output/Digital Input/Ethernet Communications PWA		51308448-528
Analog Input/Control Output (1ch Ai), PWA		51308452-526
MCU/Display PWA		51308456-526
Current Output PWA		51308460-526
Open Collector Output PWA		51308462-526
Ethernet Adaptor Board Kit PWA		50009071-501
Electro-Mechanical Relay		51508015-505
4-20 mA Input Resistor Assembly (250 ohm)		30731996-506
CHASSIS ASSEMBLY, UDC		50150597-501
Case Assembly (including Mounting Kit with four brackets)		51452759-501
Mounting Kits (12 Brackets)		51452763-501
DIN Adaptor Kit		30755223-003
Panel Bracket Kit		50004821-501
Quick Start Guide	English	51-52-25-166
Product Manual	English	51-52-25-165

ATTENTION: It is recommended to use Honeywell provided accessories and kits. Otherwise, using non-Honeywell provided components would take risks.

Limit and Alarm Relay Contact Information

Limit Relay

> **ATTENTION:** The Limit relay is designed to operate in a Failsafe mode. This results in momentary (5 seconds maximum) limit action when power is initially applied, until the unit completes self-diagnostics. If power is lost to the unit, the Limit Control Relay will still function.

Table 3-2: Limit Relay Contact Information

Unit Power	Limit Control Relay Wiring	Variable NOT in Limit State		Variable in Limit State	
		Relay Contact	Indicators	Relay Contact	Indicators
Off	N.O.	Open	Off	Open	Off
	N.C.	Closed		Closed	
On	N.O.	Closed	Off	Open	On
	N.C.	Open		Closed	

Alarm Relays

> **ATTENTION:** Alarm relays are designed to operate in a failsafe mode (that is, de-energized during alarm sate). This results in alarm actuation when power is OFF or when initially applied, until the unit completes self diagnostics. If power is lost to the unit, the alarms will de-energize and thus the alarm contacts will close.

Table 3-3: Alarm Relay Contact Information

Unit Power	Alarm Relay Wiring	Variable NOT in Alarm State		Variable in Alarm State	
		Relay Contact	Indicators	Relay Contact	Indicators
Off	N.O.	Open	Off	Open	Off
	N.C.	Closed		Closed	
On	N.O.	Closed	Off	Open	On
	N.C.	Open		Closed	

Mounting

Physical Considerations

The controller can be mounted on either a vertical or tilted panel using the mounting kit supplied. Adequate access space must be available at the back of the panel for installation and servicing activities.

- The controller must be installed indoors.

- It must be panel mounted with the wiring terminals enclosed within the panel.

- The instrument is environmentally hardened and, when suitably enclosed, can be mounted anywhere in plant or factory, on the wall, or even on the process machine itself.

- The front panel is moisture rated NEMA3R and IP54 rated and can be easily upgraded to NEMA4X and IP66 for the most severe hose-down applications. See Mounting Method and Mounting Procedure for more information.

- It withstands ambient temperatures 0 ~ 55 C (32 ~ 131 F) and resists the effects of vibration and shock.

- Overall dimensions and panel cutout requirements for mounting the controller are shown in figure below. See Overall Dimensions for more information.

- The controller's mounting enclosure must be grounded according to CSA standard C22.2 No. 0.4.

Overall Dimensions

Dimensions and Mounting

Figure 3-1: Mounting Dimensions (not to scale)
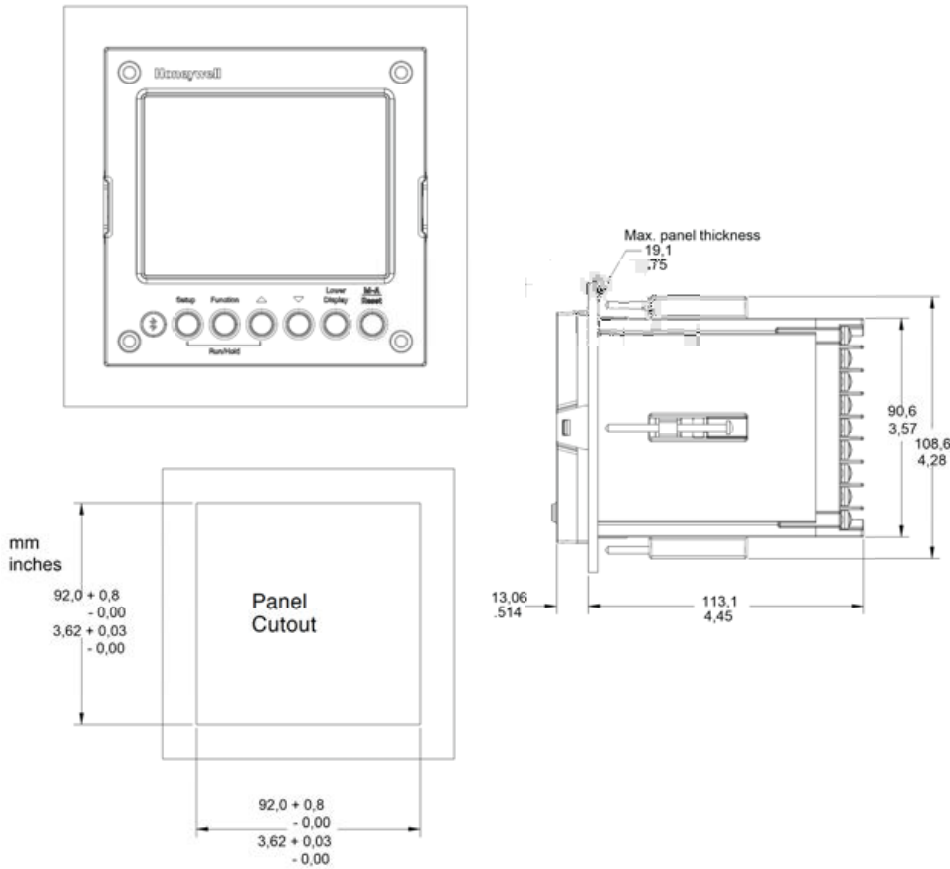
Mounting Method

Before mounting the controller, refer to the nameplate on the outside of the case and make a note of the model number. It will help later when selecting the proper wiring configuration.

Figure 3-2: Mounting Methods
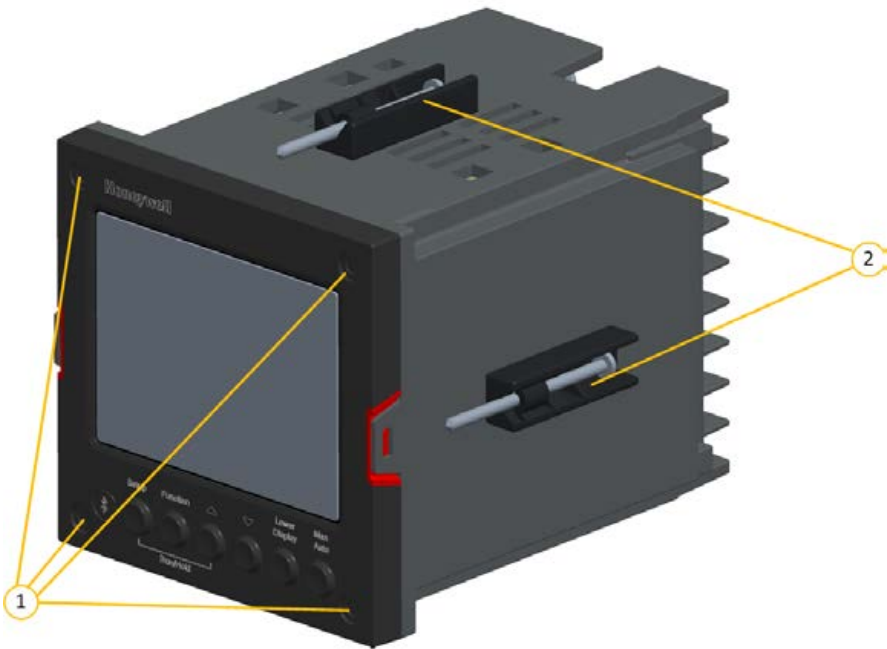
Item	Description
1	Attach screws and washers here for water protection
2	Mounting clips

Mounting Procedure

Table 3-4: Mounting Procedure

Step	Action
1	Mark and cut out the controller hole in the panel according to the dimension information. See <u>Overall Dimensions</u> for more information.
2	Orient the case properly and slide it through the panel hole from the front.
3	Remove the mounting kit from the shipping container and install the kit as follows: • **For normal (NEMA3/IP55) installation two mounting clips are required. Insert the prongs of the clips into the two holes in the top and bottom center of the case** • **For water protected (NEMA4X/IP66) installation four mounting clips are required. There are two options of where to install the mounting clips: 1) Insert the prongs of the clips into the two holes on the left and right side of the top and bottom of the case or 2) on the center on each of the four sides.** • **Tighten screws to 2 lb-inch (22 N•cm) to secure the case against the panel. CAUTION:** **CAUTION:** Over tightening will cause distortion and the unit may not seal properly.
4	For water-protected installation, install four screws with washers into the four recessed areas in the corners of the front bezel. Push the point of the screw through the center piercing the elastomeric material and then tighten screws to 5 lb-in (56 N•cm).

Wiring

Electrical Considerations

Line voltage wiring

This controller is considered "rack and panel mounted equipment" per EN61010-1, Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use, Part 1: General Requirements. Conformity with 72/23/EEC, the Low Voltage Directive requires the user to provide adequate protection against a shock hazard. The user shall install this controller in an enclosure that limits OPERATOR access to the rear terminals.

Mains Power Supply

This equipment is suitable for connection to 90 to 264 Vac or to 24 Vac/dc 50/60 Hz, power supply mains. It is the user's responsibility to provide a switch and non-time delay (North America), quick-acting, high breaking capacity, Type F (Europe), 1/2A, 250V fuse(s), or circuit-breaker for 90-264 Vac applications; or 1 A, 125 V fuse or circuit breaker for 24 Vac/dc applications, as part of the installation. The switch or circuit-breaker shall be in close proximity to the controller, within easy reach of the OPERATOR. The switch or circuit-breaker shall be marked as the disconnecting device for the controller.

> **CAUTION:** Applying 90-264 Vac to an instrument rated for 24 Vac/dc will severely damage the instrument and is a fire and smoke hazard.

When applying power to multiple instruments, make certain that sufficient current is supplied. Otherwise, the instruments may not start up normally due to the voltage drop caused by the in-rush current.

Controller Grounding

PROTECTIVE BONDING (grounding) of this controller and the enclosure in which it is installed shall be in accordance with National and Local electrical codes. To minimize electrical noise and transients that may adversely affect the system, supplementary bonding of the controller enclosure to a local ground, using a No. 12

(4 mm^2) copper conductor, is recommended.

Control/Alarm Circuit Wiring

The insulation of wires connected to the Control/Alarm terminals shall be rated for the highest voltage involved. Extra Low Voltage (ELV) wiring (input, current output, and low voltage Control/Alarm circuits) shall be separated from HAZARDOUS LIVE (>30 Vac, 42.4 Vpeak, or 60 Vdc) wiring per Permissible Wiring Bundling, Electrical Considerations-.

Electrical noise is composed of unabated electrical signals which produce undesirable effects in measurements and control circuits.

Digital equipment is especially sensitive to the effects of electrical noise. Your controller has built-in circuits to reduce the effect of electrical noise from various sources. If there is a need to further reduce these effects:

- Separate External Wiring—Separate connecting wires into bundles (See Permissible Wiring Bundling - Electrical Considerations-) and route the individual bundles through separate conduit metal trays.
  Use Suppression Devices—For additional noise protection, you may want to add suppression devices at the external source. Appropriate suppression devices are commercially available.

> **ATTENTION:** For additional noise information, refer to document number *51-52-05-01, How to Apply Digital Instrumentation in Severe Electrical Noise Environments.*

Permissible Wiring Bundling

Table 3-5: Permissible Wiring Bundling

Bundle No.	Wire Functions
1	- Line power wiring - Earth ground wiring - Line voltage control relay output wiring - Line voltage alarm wiring

Bundle No.	Wire Functions
2	**Analog** signal wire, such as: • Input signal wire (thermocouple, 4 to 20 mA, etc.) • 4-20 mA output signal wiring
3	**Digital** input signals • Low voltage alarm relay output wiring • Low voltage wiring to solid state type control circuits • Low voltage wiring to open collector type control circuits

Wiring Diagrams

Identify Your Wiring Requirements

To determine the appropriate diagrams for wiring your controller, refer to the model number interpretation in this section. The model number of the controller can be found on the outside of the case.

Wiring the Controller

Using the information contained in the model number, select the appropriate wiring diagrams from the composite wiring diagram below. Refer to the individual diagrams listed to wire the controller according to your requirements.

> **NOTE:** Torque screw assembly to 10 lb-inch (1.13 N•m) 27 places.

> **CAUTION:** ⚠ Use Copper Conductors Only for field-wiring terminals.

> **ATTENTION:** The wire gauge of terminal blocks is AWG 14~28.

> **CAUTION:** ⚠ Minimum temperature rating of the cable to be connected to the field wiring terminals is 68 °C.

Figure 3-3: Composite Wiring Diagram
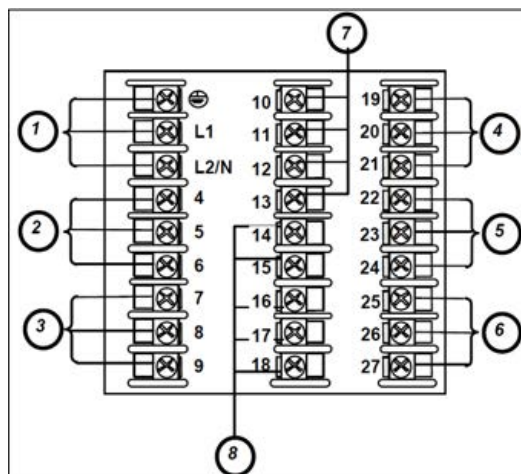
Item	Description
1	AC/DC Line Voltage Terminals.
2	Output 3 Terminals (Alarm #2 in the Table I of UDC2800 Universal Digital Limit Controller Model Selection Guide). **ATTENTION:** If they are used as Relay Outputs, the wire gauge should be AWG 14~22.
3	Output 4 Terminals (Alarm #1 in the Table I of UDC2800 Universal Digital Limit Controller Model Selection Guide). **ATTENTION:** If they are used as Relay Outputs, the wire gauge should be AWG 14~22.
4	Outputs 1Terminals (Output #1 in the Table I of UDC2800 Universal Digital Limit Controller Model Selection Guide). **ATTENTION:** If they are used as Relay Outputs, the wire gauge should be AWG 14~22.

Item	Description
5	Not used.
6	Input #1 Terminals.
7	Aux. Output and Digital Inputs Terminals.
8	Communications Terminals.

Figure 3-4: Mains Power Supply

Item	Description
1	PROTECTIVE BONDING (grounding) of this controller and the enclosure in which it is installed, shall be in accordance with National and local electrical codes. To minimize electrical noise and transients that may adversely affect the system, supplementary bonding of the controller enclosure to local ground using a 14AWG ~ 20AWG copper conductor is recommended. The wire gauge of power supply is AWG 14 (2.0 mm²) ~20 (0.5 mm²).
2	**NOTE:** It is only required for 90~264 Vac applications. It is the user's responsibility to provide a switch and non-time delay (North America), quick-acting, high breaking capacity, Type F (Europe), 1/2 A, 250 V UL listed fuse(s), or 1 A UL listed circuit-breaker for 90-264 Vac applications, as part of the installation. **ATTENTION:** The nominal current of the switch must be larger than fuse's related current.
3	The wire area of power supply is AWG 14 (2.0 mm²) ~20 (0.5 mm²).

Item	Description
	CAUTION: Applying 90-264 Vac to an instrument rated for 24 Vac/dc will severely damage the instrument and is a fire and smoke hazard.

Figure 3-5: Input 1 Connections

Item	Description
1	The 250 ohm resistor for milliamp inputs is supplied with the controller when those inputs are specified. These items must be installed prior to start up when the controller is wired. For 0-20 mA applications, the resistor should be located at the transmitter terminals if Burnout detection is desired.
2	Splice and tape this junction between the two thermocouples. This junction may be located anywhere between the thermocouples and the instrument terminals, it does not need to be close to the other thermocouple junctions. Both thermocouples must be of the same type. For best accuracy, the two thermocouples should be matched or, preferably, made from the same batch of wire.
3	This controller does not produce a steady current for burnout detection. For that reason, when a thermocouple is used in parallel with another instrument.
4	The millivolt values for the Thermocouple Differential Input are for a pair of J thermocouples at an ambient temperature mean of 450°F/ 232°C.

Figure 3-6: Electromechanical Relay Output
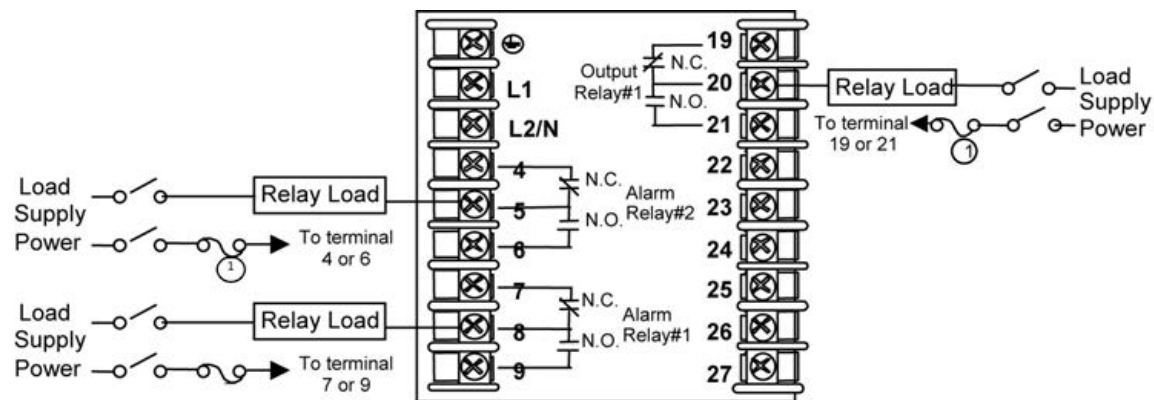
Item	Description
1	Electromechanical relays are rated at 5 Amps @ 125 Vac or 250 Vac or 30 Vdc. Users should size fuses accordingly. Use Fast Blow fuses only.

See the table Wiring Diagrams for relay terminal connections for other Output Algorithm Types.

Figure 3-7: Open Collector Output
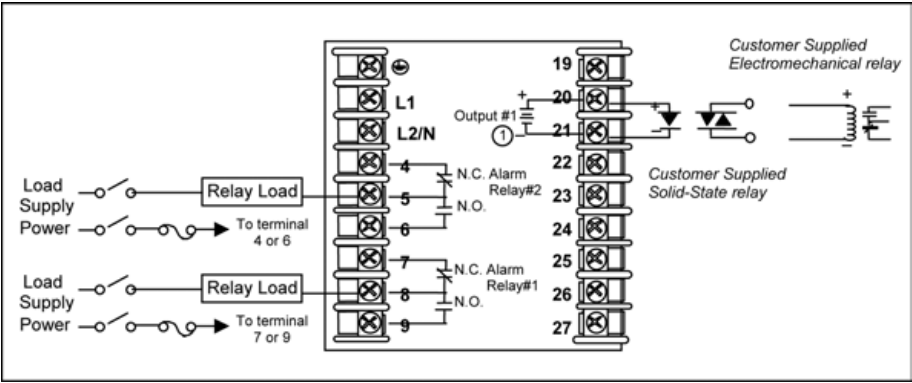
Item	Description
1	**CAUTION:** Open collector outputs are internally powered at 28 Vdc (0 mA) ~ 24 Vdc (20 mA). Connecting and external power supply will damage the controller.
2	Electromechanical relays are rated at 5 Amps @ 125 Vac or 250 Vac or 30 Vdc. Users should size fuses accordingly. Use Fast Blow fuses only.

See the table Wiring Diagrams for relay terminal connections for other Output Algorithm Types.

Figure 3-8: RS485 Communications Option Connections
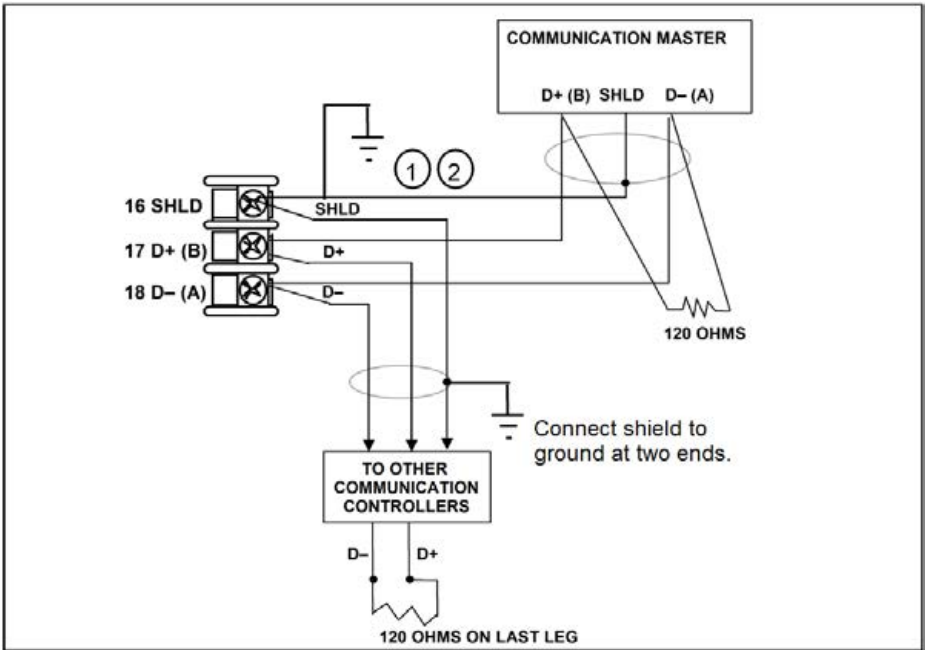
Item	Description
1	Do not run the communications lines in the same conduit as AC power.
2	Use shielded twisted pair cables (Belden 9271 Twinax or equivalent).

Figure 3-9: Ethernet Communications Option Connections
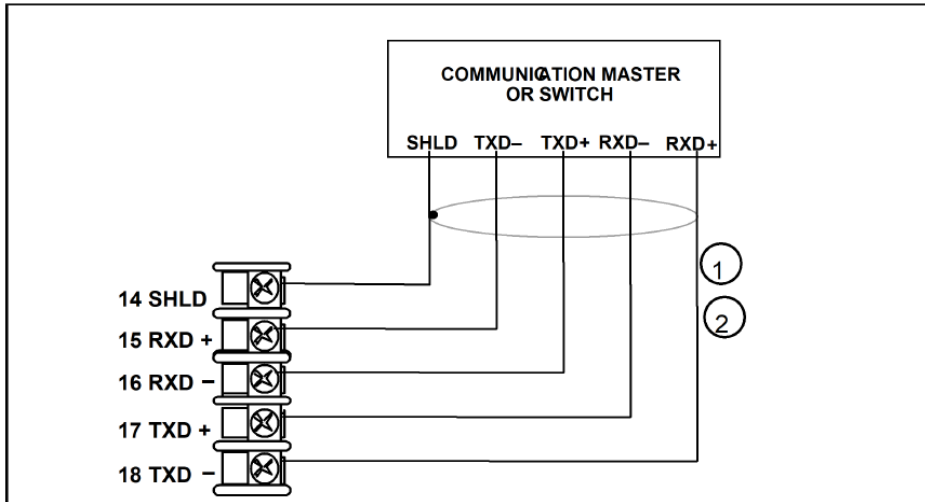
Item	Description
1	Do not run the communications lines in the same conduit as AC power. Correct connections may require the use of an Ethernet cross-over cable.
2	Use shielded twisted pair, Category 5e (STP CAT5e) Ethernet cable.

For Ethernet cable with RJ45 connector, an Ethernet Adapter Kit is required to install on the terminals.

Figure 3-10: Auxiliary Output and Digital Inputs Option Connections
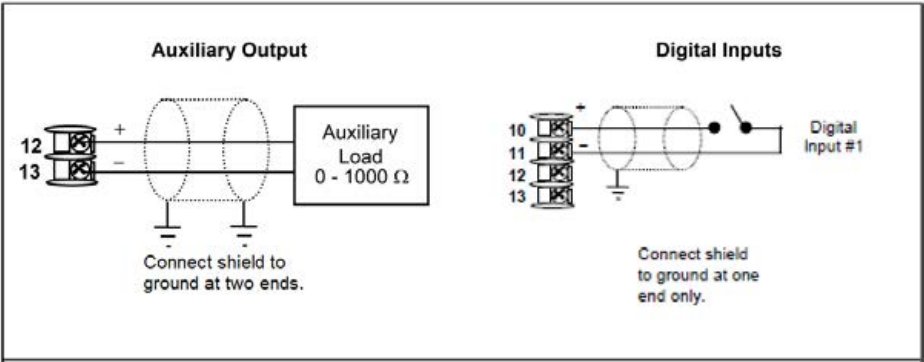
Figure 3-11: Transmitter Power for 4-20 mA — 2 wire Transmitter Using Open Collector Alarm 2 A2S1TY Deviation Output
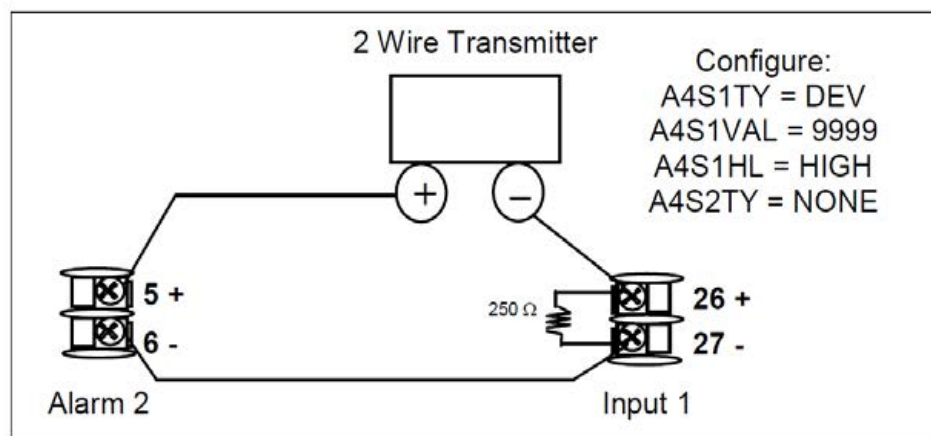
Figure 3-12: Transmitter Power for 4-20 mA — 2 Wire Transmitter Using Auxiliary Output
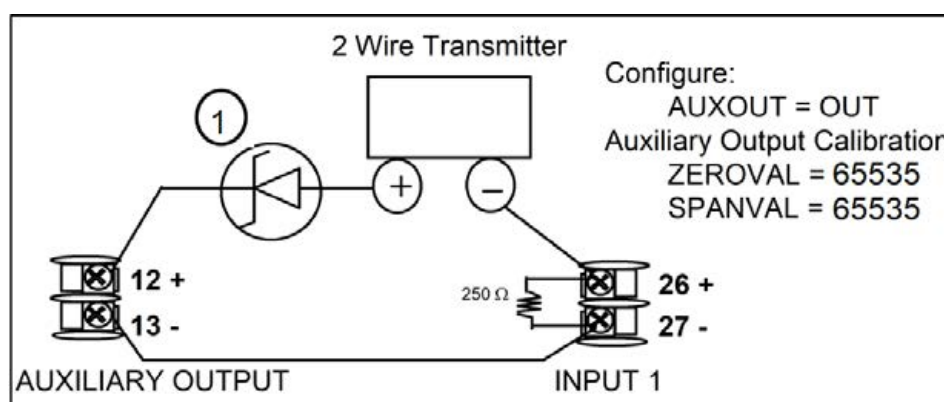
① If necessary, install a zener diode here to reduce voltage at the transmitter. A 1N4733 will reduce the voltage at the transmitter to approximately 25 Vdc.

Limit Control Application Diagram

Limit Controller Wiring

The following Limit Controller Application Diagram shows the RIGHT and WRONG way to wire the Limit Controller.
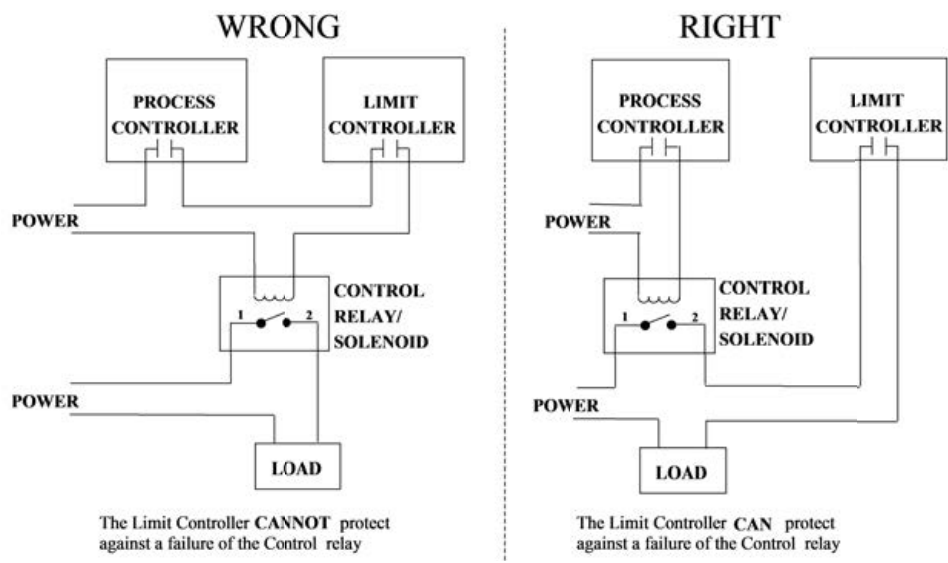
Figure 3-13: Limit Controller Application Diagram

4

CONFIGURATION

What's in this section?

The following topics are covered in this section.

In this section:

Overview

Introduction

Configuration is a dedicated operation where you use straightforward keystroke sequences to select and establish (configure) pertinent control data best suited for your application.

To assist you in the configuration process, there are prompts that appear in the upper and lower displays. These prompts let you know what group of configuration data (Set Up prompts) you are working with and the specific parameters (Function prompts) associated with each group.

Configuration Prompt Hierarchy

Table 4-1: Configuration Prompt Hierarchy

Setup Group	Function Prompts
Security	Password Lockout FM Version Restore Settings Change Password
Limit	Low or High Limit Power Up Status SP High Limit SP Low Limt Setpoint
Input 1	Input1 Type Input1 Transmitter Input1 High Value Input1 Low Value Input1 Bias Input1 Filter Input1 Burnout
Options	Auxiliary Output Co Range CO Low Value CO High Value DI 1 Function

Setup Group	Function Prompts
Communication	Bluetooth Function · Bluetooth ID · Bluetooth MAC Address · Communication Type · Modbus Address · Baud Rate · Response Delay · Word Order for Float · Ethernet Address · Subnet Mask Address · Default Gateway · Shed Function · Shed Time · Shed SP Recall · Computer SP Unit · Local Loopback
Alarms	A1S1 Type · A1S1 Value · A1S1 State · A1S1 Delay · A1S1 Hysteresis · A1S2 Type · A1S2 Value · A1S2 State · A1S2 Delay · A1S2 Hysteresis · A2S1 Type · A2S1 Value · A2S1 State · A2S1 Delay · A2S1 Hysteresis · A2S2 Type · A2S2 Value · A2S2 State · A2S2 Delay · A2S2 Hysteresis · Alarm Output1 · Alarm Blocking · AO/CO Diagnostic
Display	Decimal Digits · Temperature Unit · Language · TC Diagnostics · Theme
Input1 Calib (Calibration)	Calibrate Input 1 · Input 1 Zero · Input 1 Span · Cold Junction Temp 1
Auxiliary Calib (Calibration)	Zero Value · Span Value
Status	Software Version · Failsafe Status · Self Tests

Configuration Procedure

Introduction

Each of the Set-Up groups and their functions are pre-configured at the factory.

The factory settings are shown in Section Configuration Record Sheet.

If you want to change any of these selections or values, follow the procedure in Configuration Procedure-. This procedure tells you the keys to press to get to any Set Up group and any associated Function parameter prompt.

Procedure

See Operator Interface for more information of keys.

Table 4-2: Configuration Procedure

Step	Operation	Press	Result
1	Enter Set Up Mode	Setup key	Enter in the first set up group, Security.
2	Select any Set Up Group	Setup key or Increment key or Decrement key	Sequentially displays the other set up groups shown in the prompt hierarchy. See Configuration Prompt Hierarchy for more information. You can also use the Increment key or Decrement keys to scan the set-up groups in both directions. Stop at the set-up group title that describes the group of parameters you want to configure. Then proceed to the next step.
3	Select a Function Parameter	Function key	Enter in the first function prompt of the selected set up group.
		Increment key or Decrement key	Press Increment key or Decrement keys to display the other function prompts of the selected set up group. Stop at the function prompt

Step	Operation	Press	Result
			that you want to change.
4	Change the Value or Selection	Function key	Enter in the value or selection of the selected function prompt.
		Increment key or Decrement key	Increment or decrement the value or selection that appears for the selected function prompt. You can press the Increment and Decrement keys at the same time to move the current editable digit one step left.
5	Enter the Value or Selection	Function key	Enter value or selection made into memory.
6	Exit Configuration	Lower Display key	Exit the set up mode, and returns to the main screen.

Security Set Up Group

Introduction

Security enables you to configure lockout, password, restore the product, and we recommend that you configure this group last, after all other configuration data has been loaded.

> **ATTENTION:** Users must be careful while entering the password as the password is not hidden.

> **ATTENTION:** It is recommended to change the password after each use.

Function Prompts

Table 4-3: Security Group Function Prompts

Function Prompt	Selections or Range of Setting	Parameter Definition
Password	0000 to 9999	The level of keyboard lockout may be changed in the Set Up mode. Knowledge of a password may be required to change from one level to another. This configuration should be copied and kept in a secure location. **NOTE:** The default password for the UDC device is 1234. It is recommended to change the password after the first login. **NOTE:** The password is for keyboard entry only and is not available via communications. **NOTE:** Holding both the Increment and Decrement keys while editing numerical values in the main or setup screen allows the current editable digit to move one step left. **ATTENTION:** If the password is not correct, the following prompts cannot be displayed except **Restore Settings**.
Lockout		Lockout applies to one of the functional groups: Configuration, Calibration and SP. **ATTENTION:** Do not configure it until all configuration is complete. **NOTE:** In the Honeywell EasySet app, lockout options appears under the security group only after entering the password.

Function Prompt	Selections or Range of Setting	Parameter Definition
	None	No lockout; all groups are read/write.
	Calibration	All groups are available for read/write except for the Calibration and Keyboard Lockout groups.
	+ Configuration	All groups are read only. Calibration and Keyboard Lockout groups are not available.
	+SP	All groups are not available. read only security and status groups are available.
FM version (Read only)		
Restore Settings		Allows you to reset the controller
	Disable	Disable
	Enable	Enable
Restore*		It allows you to reset the controller while preserving configuration. **ATTENTION:** The device will restart if enabled.
	Disable	Disable
	Enable	Enable
Change Password	0 to 9999	Allows you to change the password. **NOTE:** The password is for keyboard entry only and is not available via communications. **ATTENTION:** Can only be viewed when the password you entered is correct.

Limit Set Up Group

Introduction

This data deals with the type of Limit Control you want, power up Logic, setpoint high and low limits, and the default display function Prompts

Table 4-4: LIMIT Group Function Prompts

Function Prompt Lower Display	Selection or Range of Setting Upper Display	Parameter Definition
Low or High	LOW HIGH	LOW – Limit Control – latching relay de-energizes when PV goes below configured setpoint; cannot be reset until PV rises above configured setpoint and M-A RESET key is pressed. HIGH – Limit Control – latching relay de-energizes when PV goes above configured setpoint; cannot be reset until PV drops below configured setpoint and M-A RESET key is pressed.
Power up	Reset Normal	Reset– after power down, the controller latching relay will have to be reset. Normal– after power down, the controller will operate normally in the same mode as before power was removed unless a limit has been exceeded. If the limit was latched at power down, the unit will be in "Limit" at power up and must be reset.
SetPoint High Limit	0 % to 100 % of input in engineering units	HIGH SETPOINT LIMIT – this selection prevents the setpoint from going above the value selected here. The setting must be equal to or less than the upper range of the input.
SetPoint Low Limit	0 % to 100 % of input in engineering units	LOW SETPOINT LIMIT – this selection prevents the setpoint from going below the value selected here. The setting must be equal to or greater than the lower range of the input.

Input 1 Set Up Group

Introduction

This data deals with various parameters required to configure Input 1.

Function Prompts

Table 4-5: INPUT 1 Group Function Prompts

Function Prompt	Selections or Range of Setting	Parameter Definition
Input 1 Type		**Input 1 Actuation Type** – This selection determines what actuation you are going to use for Input 1. See Minimum and Maximum Range Values for more information. **ATTENTION:** Changing the input type will result in the loss of Field Calibration values and will restore Factory Calibration values.
	Disable	Disables Input
	TC B	B Thermocouple
	TC E High	E Thermocouple High
	TC E Low	E Thermocouple Low
	TC J High	J Thermocouple High
	TC J Mid	J Thermocouple Med
	TC J Low	J Thermocouple Low
	TC K High	K Thermocouple High
	TC K Mid	K Thermocouple Med
	TC K Low	CK Thermocouple Low
	TC M High	M Thermocouple High (Ni-Ni-Moly)

Function Prompt	Selections or Range of Setting	Parameter Definition
	TC M Low	M Thermocouple Low (Ni-Ni-Moly)
	TC N High	N Thermocouple High (Nicrosil-Nisil)
	TC N Low	N Thermocouple Low (Nicrosil-Nisil)
	TC R	R Thermocouple
	TC S	S Thermocouple
	TC T High	T Thermocouple High
	TC T Low	T Thermocouple Low
	TC C High	C Thermocouple High (W5W26)
	TC C Low	C Thermocouple Low (W5W26)
	TC PR40-PR20	PR40-PR20 Thermocouple
	RTD Pt100	100 Ohm RTD High
	RTD Pt100 Low	100 Ohm RTD Low
	RTD Pt200	200 Ohm RTD
	RTD Pt500	500 Ohm RTD
	0-20mA	0 to 20 Milliamperes
	4-20mA	4 to 20 Milliamperes
	0-10mV	0 to 10 Millivolts
	0-50mV	0 to 50 Millivolts
	0-100mV	0 to 100 Millivolts
	0-5 V	0 to 5 Volts
	1-5 V	1 to 5 Volts
	0-10 V	0 to 10 Volts
	TC Differential	Thermocouple Differential
Input 1	TC B	**Transmitter Characterization** —This selection lets you

Function Prompt	Selections or Range of Setting	Parameter Definition
Transmitter	TC E High	instruct the controller to characterize a linear input to represent a non-linear one. If characterization is performed by the transmitter itself, then select Linear.
	TC E Low	
	TC J High	
	TC J Mid	**ATTENTION:** Prompt only appears when a linear actuation is selected at prompt Input 1 Type.
	TC J Low	
	TC K High	
	TC K Mid	FOR EXAMPLE:
	TC K Low	If input 1 is a 4 to 20 mA signal, but the signal represents a type K H thermocouple, then configure K TC H and the controller will characterize the 4 to 20 mA signal so that it is treated as a type K thermocouple input (high range).
	TC M High	
	TC M Low	
	TC N High	
	TC N Low	Parameter definitions are the same as in Input 1 Type.
	TC R	
	TC S	
	TC T High	
	TC T Low	
	TC W High	
	TC W Low	
	TC PR40-PR20	
	RTD Pt100	
	RTD Pt100 Low	
	RTD Pt200	
	RTD Pt500	

Function Prompt	Selections or Range of Setting	Parameter Definition
	Linear Square Root	
Input 1 High Value	−999. To 9999. Floating (in engineering units)	Input 1 High Range Value in engineering units is displayed for all inputs but can only be configured for linear or square root transmitter characterization. Scale the #1 input signal to the display value you want for 100 %. FOR EXAMPLE: Process Variable = Flow Range of Flow = 0 to 250 Liters/Minute Actuation (Input 1) = 4 to 20 mA Characterization (XMITTER) = LINEAR Set IN1 HI display value to 250 Set IN1 LO display value to 0 Then 20 mA = 250 Liters/Minute and 4 mA = 0 Liters/Minute **ATTENTION:** The control setpoint will be limited by the range of units selected here.
Input 1 Low Value	−999. To 9999. Floating (in engineering units)	Input 1 Low Range Value in engineering units is displayed for all inputs but can only be configured for linear or square root transmitter characterization. Scale the #1 input signal to the display value you want for 0 %. See example above. **ATTENTION:** The control setpoint will be limited by the range of units selected here.
Input 1 Bias	−999. to 9999. (in engineering units for non FM version) -10 to 10 for	Bias on Input 1 — Bias is used to compensate the input for drift of an input value due to deterioration of a sensor, or some other cause. Select the bias value you want on Input 1.

Function Prompt	Selections or Range of Setting	Parameter Definition
	FM version	
Input 1 Filter	0 to 120 seconds No filter = 0	Filter for Input 1 —A software digital filter is provided for Input 1 to smooth the input signal. You can configure the first order lag time constant from 1 to 120 seconds. If you do not want filtering, enter 0.
Input 1 Burnout		**Burnout Protection (Sensor Break)** provides most input types with upscale or downscale protection if the input fails.
	Upscale Burnout	It will force the Input 1 signal to the full scale value when the sensor fails. Diagnostic message IN1 FAIL intermittently flashed on the lower display.
	Downscale Burnout	It will force the Input 1 signal to the lower range value when the sensor fails. Diagnostic message IN1 FAIL intermittently flashed on the lower display.

Options Set Up Group

Introduction

The Options group lets you configure the remote mode switch (Digital Inputs) to a specific contact closure response or configure the Auxiliary Output to be a specific selection with desired scaling.

Function Prompts

Table 4-6: OPTION Group Function Prompts

Function Prompt Lower Display	Selection or Range of Setting Upper Display	Parameter Definition
Auxiliary Output		**AUXILIARY OUTPUT SELECTION** This selection provides an mA output representing one of several control parameters. The display for auxiliary output viewing will be in engineering units for all but output. Output will be displayed in percent. **ATTENTION:** Other prompts affected by these selections: 4mA VAL and 20mA VAL.
	Disable	NO AUXILIARY OUTPUT
	PV	PROCESS VARIABLE—Represents the percentage of the process variable calculated with respect to configured Auxiliary Output range (Auxiliary output low scaling factor to Auxiliary output high scaling factor).
	Deviation	DEVIATION (PROCESS VARIABLE MINUS SETPOINT)—Represents Deviation percentage calculated with respect to the configured Auxiliary Output range (Auxiliary low scaling factor to Auxiliary high scaling factor).

Function Prompt Lower Display	Selection or Range of Setting Upper Display	Parameter Definition
		NOTE: If PV or deviation value goes below Auxiliary output low scaling factor, display percentage is set to 0 % and the output current driven is limited to 4 mA. If PV or deviation value goes above the Auxiliary output high scaling factor, then the display percentage can be greater than 100 % and output current to a maximum value of 22 mA.
0 Percentage	Value in Engineering Units	AUXILIARY OUTPUT LOW SCALING FACTOR—Use a value in engineering units to represent all AUX OUT parameters except output. Use value in percent (%) for output. (Output can be between –5 % and +105 %.)
100 Percentage	Value in Engineering Units	AUXILIARY OUTPUT HIGH SCALING FACTOR—Use a value in engineering units to represent all AUX OUT parameters except output. Use a value in percent (%) for Output. (Output can be between –5 % and +105 %.)
Digital Input 1	Disable Enable	EXTERNAL RESET (DIGITAL INPUT) — resets the latching relay on contact closure. Disable the function. Enable the function.

Communications Group

Introduction

The Communications group lets you configure the controller with Easyset, a mobile app that communicates through Bluetooth, and lets a Modbus® client/master host communicate with the controller via Ethernet TCP/IP protocol.

A controller with the Ethernet option looks for messages from the host computer. If these messages are not received within the configured shed time, the controller will SHED from the communications link and return to stand-alone operation. You can also set the SHED output mode and setpoint recall, and communication units.

Up to 99 addresses can be configured over this link. The number of units that can be configured depends on the link length, with 31 being the maximum for short link lengths and 15 drops being the maximum at the maximum link length.

Function Prompts

Table 4-7: Communications Group Function Prompts

Function Prompt	Selections or Range of Setting	Parameter Definition
Bluetooth Function	Disable Enable	Disables/enables the Bluetooth function.
Bluetooth ID	UXXXXXXXX	Read only. It is an ID that is assigned to a controller that is to be used with the communications option.
Bluetooth Mac Address	XX:XX:XX:XX:XX:XX	Read only.
Communication Type		Communication type selection – enables the RS485 or Ethernet communication port.
	Disable	Disable —Disables communications option.
	Modbus	Modbus —Enables RS485 Modbus RTU communication port.

Function Prompt	Selections or Range of Setting	Parameter Definition
	Ethernet	Ethernet —Enables Ethernet communication port.
Modbus Address	1 to 99	Communications station address —This is a number that is assigned to a controller that is to be used with the communications option. This number will be its address.
Baud Rate		Baud Rate is the transmission speed in bits per second. This value is used for RS-485.
	4800	4800 BAUD
	9600	9600 BAUD
	19200	19200 BAUD
	38400	38400 BAUD
Response Delay	1 to 500 milliseconds	Response Delay —Configurable response-delay timer allows you to force the instrument to delay its response for a time period of from 1 to 500 milliseconds compatible with the host system hardware/software.
Word Order for Float		Defines word/byte order of floating point data for communications. Byte values: | 0	1	2	3
---	---	---	---
seeeeeee	emmmmmmm	mmmmmmmm	mmmmmmmm	 Where: s = sign, e = exponent, m = mantissa bit
	FP_B	0 / 1 / 2 / 3
	FP_BB	1 / 0 / 3 / 2
	FP_L	3 / 2 / 1 / 0
	FP_LB	2 / 3 / 0 / 1
Ethernet Address	0.0.0.0 to 255.255.255.2	Ethernet address, ranging from 0.0.0.0 to 255.255.255.255. It only applies to Ethernet

Function Prompt	Selections or Range of Setting	Parameter Definition
	55	communication port. The default value is 10.0.0.2.
Subnet Mask Address	0.0.0.0 to 255.255.255.255	Subnet Mask address, ranging from 0.0.0.0 to 255.255.255.255. It only applies to Ethernet communication port. The default value is 255.255.255.255.
Default Gateway	0.0.0.0 to 255.255.255.255	Default Gateway, ranging from 0.0.0.0 to 255.255.255.255. It only applies to Ethernet communication port. The default value is 0.0.0.0.
Shed Function	Disable Enable	Disables/enables shed functionality.
Shed Time	0 to 255	Shed Time —The number that represents how many sample periods there will be before the controller sheds from communications. Each period equals 1/3 seconds; 0 equals No shed. **NOTE:** Shed Time is not configurable if Communication Type is set to Modbus, and Shed Function is set to Disable.
Shed SP Recall		Shed Setpoint Recall **NOTE:** It is not configurable if Shed Function is set as Disable.
	To Local SP	Controller will use last local setpoint.
	To Computer SP	When in "slave" mode, the controller will store the last host computer setpoint and use it at the Local setpoint. When in "monitor" mode, the controller will shed to the last instrument Local or Remote setpoint used, and the LSP is unchanged.

Function Prompt	Selections or Range of Setting	Parameter Definition
Computer SP Unit		Computer Setpoint Units
	Engineering Unit	Engineering units
	Percent	Percent of PV range
Local Loopback		Local Loopback tests the RS-485 communications port. It is not used for any other communications port.
	Disable	Disables the Loopback test.
	Enable	Allows loopback test. The instrument goes into Loopback mode in which it sends and receives its own message. The instrument displays PASS or FAIL status in the upper display and LOOPBACK in the lower display while the test is running. The instrument will go into manual mode when LOOPBACK is enabled with the output at the Failsafe value. The test will run until the operator disables it here, or until power is turned off and on. **ATTENTION:** The instrument does not have to be connected to the external communications link in order to perform this test. If it is connected, only one instrument should run the loopback test at a time. The host computer should not be transmitting on the link while the loopback test is active.

Alarms Set Up Group

Introduction

An alarm is an indication that an event that you have configured (for example—Process Variable) has exceeded one or more alarm limits. There are two alarms available. Each alarm has two setpoints. You can configure each of these two setpoints to alarm on various controller parameters.

There are two alarm output selections, High and Low. You can configure each setpoint to alarm either High or Low. These are called single alarms.

You can also configure the two setpoints to alarm on the same event and to alarm both high and low. A single adjustable Hysteresis of 0 % to 100 % is configurable for the alarm setpoint.

See Alarm Relay Contact Information in the Installation section for Alarm relay contact information.

The prompts for the Alarm Outputs appear whether the alarm relays are physically present or not. This allows the Alarm status to be shown on the display and/or sent via communications to a host computer.

Function Prompts

Table 4-8: ALARMS Group Function Prompts

Function Prompt Lower Display	Selection or Range of Setting Upper Display	Parameter Definition
A1S1 type		ALARM 1 SETPOINT 1 TYPE—Select what you want Setpoint 1 of Alarm 1 to represent. It can represent the Process Variable, Deviation, and if you have a model with communications, you can configure the controller to alarm on SHED.
	None	No Alarm
	PV	Process Variable
	Deviation	Deviation

Function Prompt Lower Display	Selection or Range of Setting Upper Display	Parameter Definition
		ATTENTION: Alarm set-point range is configurable from 0 to 9999.
	SHED	Shed from Communications
	Failsafe	Failsafe
	PV Rate of Change	PV Rate of Change **ATTENTION:** Alarm set-point range is configurable from 0 to 9999.
	DI 1 Actuated	Digital Input 1 Actuated
	TC Warning	Thermocouple Warning **ATTENTION:** NOTE 1. Thermocouple Warning means that the instrument has detected that the Thermocouple Input is starting to fail. Not valid for input types other than Thermocouple.
	TC Failed	Thermocouple Fail **ATTENTION:** NOTE 2. Thermocouple Failing means that the instrument has detected that the Thermocouple Input is in imminent danger of failing. Not valid for input types other than Thermocouple.
A1S1 Value	Value in engineering units	ALARM 1 SETPOINT 1 VALUE—This is the value at which you want the alarm type chosen in prompt A1S1 Type to actuate. The value depends on what the setpoint has been configured to represent. No setpoint is required for alarms configured for Communications SHED.

Function Prompt Lower Display	Selection or Range of Setting Upper Display	Parameter Definition
		This prompt does not appear for Alarm Types that do not use values. For example: A1S1 Type = DI 1 Actuated.
A1S1 State	HIGH Alarm LOW Alarm	ALARM 1 SETPOINT 1 STATE—Select whether you want the alarm type chosen in prompt A1S1 Type to alarm High or Low. HIGH ALARM LOW ALARM
A1S1 Hysteresis	0.0 to 100.0 % of span or full output as appropriate	ALARM HYSTERESIS—A single adjustable hysteresis is provided on alarms such that when the alarm is OFF it activates at exactly the alarm setpoint; when the alarm is ON, it will not deactivate until the variable is 0.0 % to 100 % away from the alarm setpoint. Configure the hysteresis of the alarms based on INPUT signals as a % of input range span. Configure the hysteresis of the alarm based on OUTPUT signals as a % of the full scale output range.
A1S2 Type		ALARM 1 SETPOINT 2 TYPE—Select what you want Setpoint 2 of Alarm 1 to represent. The selections are the same as A1S1TYPE.
A1S2 Value	Value in engineering units	ALARM 1 SETPOINT 2 VALUE—This is the value at which you want the alarm type chosen in prompt A1S2 Type to actuate. The details are the same as A1S1 VAL.
A1S2 State	HIGH Alarm LOW Alarm	ALARM 1 SETPOINT 2 STATE—Same as A1S1HL.
A1S2 Hysteresis	0.0 to 100.0 % of span or full output as appropriate	ALARM HYSTERESIS—A single adjustable hysteresis is provided on alarms such that when the alarm is OFF it activates at exactly the alarm setpoint; when the alarm is ON, it will not deactivate until the variable is 0.0 % to

Function Prompt Lower Display	Selection or Range of Setting Upper Display	Parameter Definition
		100 % away from the alarm setpoint. Configure the hysteresis of the alarms based on INPUT signals as a % of input range span. Configure the hysteresis of the alarm based on OUTPUT signals as a % of the full scale output range.
A2S1 Type		ALARM 2 SETPOINT 1 TYPE—Select what you want Setpoint 1 of Alarm 2 to represent. The selections are the same as A1S1 Type. **ATTENTION:** Not applicable with Relay Duplex unless using Dual Relay PWA.
A2S1 Value	Value in engineering units	ALARM 2 SETPOINT 1 VALUE—This is the value at which you want the alarm type chosen in prompt A2S1 Type to actuate. The details are the same as A1S1 VAL.
A2S1 State	HIGH Alarm LOW Alarm	ALARM 2 SETPOINT 1 STATE—Same as A1S1HL.
A2S1 Hysteresis	0.0 to 100.0 % of span or full output as appropriate	ALARM HYSTERESIS—A single adjustable hysteresis is provided on alarms such that when the alarm is OFF it activates at exactly the alarm setpoint; when the alarm is ON, it will not deactivate until the variable is 0.0 % to 100 % away from the alarm setpoint. Configure the hysteresis of the alarms based on INPUT signals as a % of input range span. Configure the hysteresis of the alarm based on OUTPUT signals as a % of the full scale output range.
A2S2 Type	Value in engineering units	ALARM 2 SETPOINT 2 TYPE—Select what you want Setpoint 2 of Alarm 2 to represent.

Function Prompt Lower Display	Selection or Range of Setting Upper Display	Parameter Definition
		The selections are the same as A1S1 Type. **ATTENTION:** Not applicable with Relay Duplex unless using Dual Relay PWA.
A2S2 Value		ALARM 2 SETPOINT 2 VALUE—This is the value at which you want the alarm type chosen in prompt A2S2 Type to actuate. The details are the same as A1S1 VAL.
A2S2 State	HIGH Alarm LOW Alarm	ALARM 2 SETPOINT 1 STATE—Same as A1S1HL.
A2S2 Hysteresis	0.0 to 100.0 % of span or full output as appropriate	ALARM HYSTERESIS—A single adjustable hysteresis is provided on alarms such that when the alarm is OFF it activates at exactly the alarm setpoint; when the alarm is ON, it will not deactivate until the variable is 0.0 % to 100 % away from the alarm setpoint. Configure the hysteresis of the alarms based on INPUT signals as a % of input range span. Configure the hysteresis of the alarm based on OUTPUT signals as a % of the full scale output range.
ALARM Output1	Non-latching Latching	LATCHING ALARM OUTPUT 1—Alarm output 1 can be configured to be Latching or Non-latching. Non-latching Latching **ATTENTION:** When configured for latching, the alarm will stay active after the alarm condition ends until the RUN/HOLD key is pressed.
Alarm Blocking		ALARM BLOCKING—Prevents nuisance alarms when the controller is first powered up. The

Function Prompt Lower Display	Selection or Range of Setting Upper Display	Parameter Definition
	Disable Alarm 1 Alarm 2 Alarm 1 & 2	alarm is suppressed until the parameter gets to the non-alarm limit or band. Alarm blocking affects both alarm setpoints. Disables blocking Blocks alarm 1 only Blocks alarm 2 only Blocks both alarms **ATTENTION:** When enabled on power up or initial enabling via configuration, the alarm will not activate unless the parameter being monitored has not been in an alarm condition for a minimum of one control cycle (167 ms).
AO/CO Diagnostic	Disable Alarm 1 Alarm 2 Disable Warning	DIAGNOSTIC—Monitors the Current Output and/or Auxiliary Output for an open circuit condition. If either of these two outputs falls below about 3.5 mA, then an Alarm is activated. This configuration is in addition to whatever was selected for AxSx Type. Disables Diagnostic Alarm Alarm 1 is diagnostic alarm Alarm 2 is diagnostic alarm Disables Output Fail message on lower display

Display Set Up Group

Introduction

This group includes selections for Decimal place, Units of temperature, and Language.

Function Prompts

Table 4-9: Display Group Function Prompts

Function Prompt	Selections or Range of Setting	Parameter Definition
Decimal Digits		Decimal Point Location —This selection determines where the decimal point appears in the main screen display.
	None	No Decimal Place—fixed, no auto-ranging
	One Digit	One Place
	Two Digits	Two Places
	Three Digits	Three Places
Temperature Unit		This selection will affect the indication and operation.
	Deg Fahrenheit	Degrees Fahrenheit – Degrees F Annunciator lighted
	Deg Centigrade	Degrees Centigrade – Degrees C Annunciator lighted
	None	No temperature annunciators lighted. Upper and Lower Displays will show temperature in Degrees Fahrenheit when inputs are configured for Thermocouple or RTD types.
Language	English	This selection designates the prompt language, English.
TC Diagnostics		Thermocouple Diagnostics — Enable or disable Thermocouple diagnostic messages on the Lower Display.
	Enable	Enable Diagnostic Messages

Function Prompt	Selections or Range of Setting	Parameter Definition
	Disable	Disable Diagnostic Messages
Theme	Dark	This selection applies the Dark theme to the UDC device.
	White	This selection applies the White theme to the UDC device. **NOTE:** After changing the theme, the UDC device must be restarted for the new theme to take effect.

Input1 Calib Set Up Group

Introduction

This group appears when **Input 1 Type** of **Input 1** set up group is NOT configured as **Disabled**. See Input 1 Set Up Group for more information.

Function Prompts

Table 4-10: Input1 Calib Group Function Prompts

Function Prompt	Selections or Range of Setting	Parameter Definition
Calibrate Input 1	Disable	Disable the calibration.
	Begin	To begin the calibration. The following function prompts appear except Cold Junction Temp 1.
Input 1 Zero	It depends on the input type.	Adjust your calibration device to an output signal equal to the 0 % range value for your particular input sensor. See the table Voltage, Milliamp and Resistance Equivalents for Input Range Values for Voltage, Degrees, or Resistance equivalents for 0 % range values.

Function Prompt	Selections or Range of Setting	Parameter Definition
Input 1 Span	It depends on the input type.	Adjust your calibration device to an output signal equal to the 100 % range value for your particular input sensor. See the table Voltage, Milliamp and Resistance Equivalents for Input Range Values for Voltage, Degrees, or Resistance equivalents for 100 % range values.
Cold Junction Temp 1	The value is in tenths of a degree.	It only appears when the Input 1 Type is configured as TC. It is the current reading of the temperature as measured at the thermocouple terminals and recognized by the controller. You can change this value, if it is in error, using the Increment key or Decrement key.

Auxiliary Calib Set Up Group

Introduction

This group appears when **Auxiliary Output** of **Options** set up group is NOT configured as **Disable**. See Options Set Up Group for more information.

Function Prompts

Table 4-11: Auxiliary Calib Group Function Prompts

Function Prompt	Selections or Range of Setting	Parameter Definition
Zero Value	It ranges from 0 to 65535.	The desired 0 % output is read on the milliammeter. Normally, this will be the setting that produces 4 mA.
Span Value	It ranges from 0 to 65535.	The desired 100 % output is read on the milliammeter. Normally, this will be the setting that produces 20 mA.

Configuration Record Sheet

Enter the value or selection for each prompt on this sheet so you will have a record of how your controller was configured.

Group Prompt	Function Prompt	Value or Selection	Factory Setting
Security	Password Lockout FM Version Restore Settings Change Password	_____ _____ _____ _____ _____	0 Calibration Disable Disable - -
Limit Control	Low or High Limit Power Up Status SP High Limit SP Low Limit	_____ _____ _____ _____	High Limit Normal 1000 0
Input 1	Input 1 Type Input 1 Transmitter Input 1 High Value Input 1 Low Value Input 1 Bias Input 1 Filter Input 1 Burnout	_____ _____ _____ _____ _____ _____ _____	0-10 mV Linear 1000 0 0 1 No Burnout
Options	Auxiliary Output DI 1 Function DI 1 Combination	_____ _____ _____	Disable None Disable
Communication	Bluetooth Function Bluetooth ID Bluetooth MAC Address Communication Type Modbus Address Baud Rate Response Delay Word Order for Float Ethernet Address Subnet Mask Address Default Gateway Shed Function Shed Time Shed SP Recall Computer SP Unit Local Loopback	_____ Read only Read only _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____	Disable UXXXXXXXX XX:XX:XX:XX:XX:XX Disable 3 19200 1 FP B 0123 10.0.0.2 255.255.255.0 0.0.0.0 Disable 30 To Local SP Engineering Unit Disable

Group Prompt	Function Prompt	Value or Selection	Factory Setting
Alarms	A1S1 Type	_____	None
	A1S1 Value	_____	90
	A1S1 State	_____	High Alarm
	A1S1 Delay	_____	0
	A1S1 Hysteresis	_____	0.1
	A1S2 Type	_____	None
	A1S2 Value	_____	10
	A1S2 State	_____	Low Alarm
	A1S2 Delay	_____	0
	A1S2 Hysteresis	_____	0.1
	A2S1 Type	_____	None
	A2S1 Value	_____	95
	A2S1 State	_____	High Alarm
	A2S1 Delay	_____	0
	A2S1 Hysteresis	_____	0.1
	A2S2 Type	_____	None
	A2S2 Value	_____	5
	A2S2 State	_____	Low Alarm
	A2S2 Delay	_____	0
	A2S2 Hysteresis	_____	0.1
	Alarm Output 1	_____	Non Latching
	Alarm Blocking	_____	Disable
	AO/CO Diagnostic	_____	Disable
Display	Decimal Digits	_____	None
	Temperature Unit	_____	None
	Language	_____	English
	TC Diagnostics	_____	Enable
	Theme	_____	White/Black
Communication with RS485 board (Accessible via Communication set up group or Honeywell EasySet)	Bluetooth Function	_____	Disable
	Bluetooth ID	Read only	UXXXXXXXX
	Bluetooth MAC Address	Read only	XX:XX:XX:XX:XX:XX
	Communication Type	_____	Disable
	Modbus Address	_____	3
	Baud Rate	_____	19200
	Response Delay	_____	1
	Word Order for Float	_____	FP B 0123
	Shed Function	_____	Disable
	Shed Time	_____	30
	Shed Mode	_____	Last Mode
	Shed SP Recall	_____	To Local SP

Group Prompt	Function Prompt	Value or Selection	Factory Setting
	Computer SP Unit Local Loopback	_____ _____	Engineering Unit Disable
Communication with Ethernet board (Accessible via Communication set up group or Honeywell EasySet)	Bluetooth Function Bluetooth ID Bluetooth MAC Address Communication Type Modbus Address Baud Rate Response Delay Word Order for Float Ethernet Address Subnet Mask Address Default Gateway Shed Function Shed Time Shed Mode Shed SP Recall Computer SP Unit Computer SP Ratio Computer SP Bias	_____ Read only Read only _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____	Disable UXXXXXXXX XX:XX:XX:XX:XX:XX Disable 3 19200 1 FP B 0123 10.0.0.2 255.255.255.0 0.0.0.0 Disable 30 Last Mode To Local SP Engineering Unit 1.00 0
Status	Software Version	Read only	- -

OPERATING THE LIMIT CONTROLLER

What's in this section?

The following topics are covered in this section.

In this section:

Overview

Introduction

This section gives you all the information necessary to help you monitor your controller including an Operator Interface overview, how to lockout changes to the controller, entering a security code, and monitoring the displays.

Operator Interface

Figure 5-1: Operator Interface

Entering a Security Code

Introduction

The level of keyboard lockout may be changed in the Setup mode. However, knowledge of a security code number (0 to 9999) may be required to change from one level of lockout to another. When a controller leaves the factory, it has a security code of 1234 which should be entered and changed after the first power up or after restoring to factory default settings.

Procedure

If you require the use of a security code, select a number from 0001 to 9999 and enter it when the lockout level is configured as None. Thereafter, that selected number must be used to change the lockout level from something other than None.

Step	Operation	Press	Result
1	Enter Setup Mode	Setup key	The first set up group is Security.
2	Select the function prompt Password	Function key	Enter into the first function prompt Password of the Security set up group. Press the Function key again to enter in the configuration prompt of Password.
3	Enter Security Code	Increment key or Decrement key	To enter a four digit number (0001 to 9999) This will be your security code. **ATTENTION:** Users must be careful while entering the password as the password is not hidden.

Lockout Feature

Introduction

The lockout feature is used to inhibit changes (via keyboard) of certain functions or parameters by unauthorized personnel.

See Security Set Up Group for more information.

Lockout levels

> **NOTE:** In the EasySet app, lockout options appears under the security group only after entering the password.

There are different levels of Lockout depending on the level of security required. These levels are:

- None: No Lockout. All groups Read/Write.
- Calibration: Calibration prompts are deleted from the Setup List.
- +Configuration: LIMIT, Input 1 and options, communication alarm display states read only. All Setup are Read only. Calibration Group is not available.
- +SP: Status and security group are Read/write only. others not available

Key error

When a key is pressed and the prompt "Key Error" appears in the Diagnostics display, it will be for one of the following reasons:

- Parameter not available or locked out
- Not in setup mode, press Setup key first
- Function locked out

Monitoring Your Controller

Annunciators

For annunciators provided to help monitor the controller, see Function of displays for more information.

Viewing the operating parameters

Under the main screen, press the Lower Display key to scroll through the operating parameters listed in table below. The lower display will show only those parameters and their values that apply to your specific model.

Table 5-1: Lower Display Key Parameter Prompts

Lower Display	Description
CSP XXXX.XXX	Computer Setpoint—When SP is in override. • In the **Communication** set up group, enable **Shed Function**. And CSP is successfully override by SP override through Modbus.

Diagnostic Messages

The UDC2800 limit controller performs background tests to verify data and memory integrity. If there is a malfunction, an error message is displays. In the case of more than one simultaneous malfunction, the messages are displayed sequentially on the lower display. If any of these error messages in Table 4-3 occur, See the section Background Tests and Diagnostic Messages for a list of the Diagnostic Messages and how to correct the problems that they indicate.

Prompt	Description
EE Fail	Unable to write to nonvolatile memory.
Input 1 Fail	Two consecutive failures of input 1 integration.
Configuration Errors	Configuration Errors—Low limit greater than high limit for PV or SP
Input 1 Range	Input 1 Out-of-Range Out-of-range criteria: • Linear range: ±10% out-of-range • Characterized range: ±1% out-of-range
PV Limits	PV Out-of-Range PV = PV + PV bias
Fails Safe	Failsafe — conditions for Failsafe are: • EEROM Test Failed • Scratch Pad RAM Test Failed • Configuration Test Failed
TC Warning	Thermocouple sensor is starting to burnout.
TC Fail	Thermocouple sensor is in imminent danger of burning out.
Output 2 Fail	Current Output 2 failure is less than 3.5 mA.

Start Up Procedure for Operation

It is required to enter the initial password and a new password when start up the controller for the first time. The initial password is 1234.

For more information of interface displays, see the section <u>Function of displays</u>.

Table 5-2: Procedure for Starting Up the Controller

Step	Operation	Press	Result
1	Enter the Local Setpoint	Lower Display key	Until the required "SP" and the Local Setpoint Value are displayed.
		Increment or Decrement key	To adjust the local setpoint to the value at which you want the process variable maintained.

Setpoints

Introduction

You can configure the following setpoints for the UDC2800 Limit Controller controller.

- ■ A Single Local Setpoint

Change the Setpoint value

Table 5-3: Procedure for Changing the Local Setpoints

Step	Operation	Press	Result
1	Select the Setpoint	Lower Display key	Until you see: Lower Display = SP
2	Change the Value	Increment key or Decrement key	To change the Local Setpoint to the value at which you want the process maintained. The display "blinks" if you attempt to enter setpoint values beyond the high and low limits. The configured setpoint will be stored immediately.

Alarm Setpoints

Introduction

An alarm consists of a relay contact and an operator interface indication. The alarm relay is de-energized if setpoint 1 is exceeded.

The alarm relay is energized when the monitored value goes into the allowed region by more than the hysteresis.

The relay contacts can be wired for normally open (NO) energized or normally closed (NC) de-energized using internal jumper placement.

There are four alarm setpoints, two for each alarm. The type and state (High or Low) are selected during configuration.

Alarm Setpoints Display

Table 5-4: Procedure for Displaying Alarm Setpoints

Step	Operation	Press	Result
1	Select Alarms Set-up Group	Setup key or Increment key or Decrement key	Until you see Alarms set up group

Step	Operation	Press	Result
2	Select the Alarm Setpoint Values	Function key	Enter in the first function prompt A1S1 Type.
		Increment key or Decrement key	Until you see the required Alarm setpoint. A1S1 Value = Alarm 1, Setpoint 1 Value A1S2 Value = Alarm 1, Setpoint 2 Value A2S1 Value = Alarm 2, Setpoint 1 Value A2S2 Value = Alarm 2, Setpoint 2 Value To successively display the alarm setpoints and their values. Their order of appearance is shown below. Lower Display = (the alarm setpoint value) Range values are within the range of the selected parameters except: Deviation value = Configurable from 0 to 9999 PV Rate of Change = The amount of PV change in one minute in engineering units. Loop Break Alarms (Loop Break) = The timer value may be changed only for controllers configured for ON/OFF control. **NOTE:** TC warning, TC Fail and Failsafe selections do not have setpoint values.
3	Change a value	Function key	Enter in the first selection of the selected Alarm Setpoint
		Increment key or Decrement key	Change any alarm setpoint value.
4	Enter the value	Function key	Enter the value made into memory.
5	Return to Normal Display	Lower Display key	Exit the set up mode and returns to the main screen.

INPUT CALIBRATION

What's in this section?

The following topics are covered in this section.

In this section:

> **WARNING:** INPUT CALIBRATION MAY REQUIRE ACCESS TO HAZARDOUS LIVE CIRCUITS, AND SHOULD ONLY BE PERFORMED BY QUALIFIED SERVICE PERSONNEL. MORE THAN ONE SWITCH MAY BE REQUIRED TO DE-ENERGIZE UNIT BEFORE CALIBRATION.

Overview

Introduction

This section describes the field calibration procedures for Input 1.

- All input actuations in every UDC2800 limit controller are fully factory-calibrated and are ready for configuration by the user.
- Field Calibration can improve the accuracy of the Controller if necessary for a particular application.

> **CAUTION:** The field calibration will be lost if a change in input type configuration is implemented at a later time. The original factory calibration data remains available for later use after a field calibration is done. See subsection Restore Input Factory Calibration if you want to restore factory calibration values.

Calibration Steps

Use the following steps when calibrating an input.

Step	Action
1	Find the minimum and maximum range values for your PV input range from Minimum and Maximum Range Values.
2	Disconnect the field wiring and find out what equipment you will need to calibrate.
3	Wire the calibrating device to your controller according to the set up wiring instructions for your particular input (See Input 1 Set up Wiring).
4	Follow the calibration procedure given for Input #1 (See Input 1 Calibration Procedure).

Minimum and Maximum Range Values

Select the Range Values

Calibrate the controller for the minimum (0 %) and maximum (100 %) range values of your particular input type.

Select the Voltage, Current or Resistance equivalents for 0 % and 100 % range values from Table 5-1 Voltage, Milliamp and Resistance Equivalents for Input 1 Range Values–. Use these values when calibrating your controller.

Table 6-1: Voltage, Milliamp and Resistance Equivalents for Input 1 Range Values

Sensor Type	PV Input Range		Range Values	
	°F	°C	0%	100%
Thermocouples (per ITS-90)				
TC B	0 to 3300	−18 to 1816	−0.100 mV	13.769 mV
TC E High	−454 to 1832	−270 to 1000	−9.835 mV	76.373 mV
TC E Low	-200 to 1100	-129 to 593	−6.472 mV	44.555 mV
TC J High	0 to 1600	−18 to 871	−0.886 mV	50.060 mV
TC J Mid	20 to 900	−7 to 482	− 0.334 mV	26.400 mV
TC J Low	20 to 550	−7 to 288	−0.334 mV	15.650 mV
TC K High	0 to 2400	−18 to 1316	−0.692 mV	52.952 mV
TC K Mid	−20 to 1200	−29 to 649	−1.114 mV	26.978 mV
TC K Low	−20 to	−29 to	−1.114	16.350 mV

Sensor Type	PV Input Range		Range Values	
	°F	°C	0%	100%
	750	399	mV	
TC M High (Ni-Ni-Moly)	32 to 2500	0 to 1371	0.000 mV	71.773 mV
TC M Low (Ni-Ni-Moly)	32 to 1260	0 to 682	0.000 mV	31.825 mV
TC N High (Nicrosil-Nisil)	0 to 2372	−18 to 1300	−0.461 mV	47.513 mV
TC N Low (Nicrosil-Nisil)	0 to 1472	−18 to 800	-0.461 mV	28.455 mV
TC R	0 to 3100	−18 to 1704	−0.090 mV	20.281 mV
TC S	0 to 3100	−18 to 1704	−0.092 mV	17.998 mV
TC T High	-300 to 700	−184 to 371	−5.341 mV	19.097 mV
TC T Low	-200 to 500	−129 to 260	−4.149 mV	12.574 mV
TC C High	0 to 4200	−18 to 2315	−0.234 mV	37.075 mV
TC C Low	0 to 2240	−18 to 1227	−0.234 mV	22.283 mV
Thermocouple Differential *	−50 to 150	−27.78 to 83.33	−1.54 mV	4.62 mV
RTD Alpha = 0.00385 per IEC-60751 (1995)				
RTD Pt100	−300 to 1200	−184 to 649	25.202 ohms	329.289 ohms
RTD Pt100 Low	−300 to 300	−184 to 149	25.202 ohms	156.910 ohms
RTD Pt200	−300	−184	50.404	658.578

Sensor Type	PV Input Range		Range Values	
	°F	°C	0%	100%
	to 1200	to 649	ohms	ohms
RTD Pt500	−300 to 1200	−184 to 649	126.012 ohms	1646.445 ohms
TC PR40-PR20	32 to 3416	0 to 1880	0.000 mV	4.933 mV
Linear				
Milliamps	4 to 20 mA 0 to 20 mA		4.00 mA 0.00 mA	20.00 mA 20.00 mA
Millivolts	0 to 10 mV 0 to 50 mV 0 to 100 mV		0.00 mV 0.00 mV 0.00 mV	10.00 mV 50.00 mV 100.00 mV
Volts	1 to 5 Volts 0 to 5 Volts 0 to 10 Volts		1.00 Volts 0.00 Volts 0.00 Volts	5.00 Volts 5.00 Volts 10.00 Volts
Carbon Oxygen	0 to 1250 mV -30 to 510 mV		0.00 mV -30.00 mV	1250.00 mV 510.00 mV

*   The Factory Calibrated millivolt values for the Thermocouple Differential Input are for a pair of J thermocouples at an ambient temperature mean of 450°F / 232°C. Other thermocouple types and ambient temperature means may be accomplished via Field Calibration of the input, with the range value limits being −4 mV to +16 mV for the zero and span values. See Input 1 Set up Wiring for procedure.

**   The range values for Radiamatic Type RI are customer configurable.

Preliminary Information

Disconnect the Field Wiring

Tag and disconnect any field wiring connected to the input terminals on the rear of the controller.
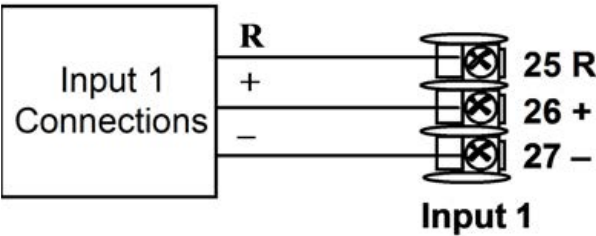
Figure 6-1: Input 1 Wiring Terminals

Equipment Needed

Table below lists the equipment you will need to calibrate the specific types of inputs that are listed in the table. You will need a screwdriver to connect these devices to your controller.

Table 6-2: Equipment Needed

Type of Input	Equipment Needed
Thermocouple Inputs (Millivolt Source)	• A calibrating device with at least ± 0.02 % accuracy for use as a signal source such as a millivolt source. • Two insulated copper leads for connecting the thermocouple inputs to the millivolt source.
RTD (Resistance Thermometer Device)	• A decade box, with at least ± 0.02 % accuracy, capable of providing stepped resistance values over a minimum range of 0 to 1650 ohms with a resolution of 0.001 ohm. • Three insulated copper leads of equal length for connecting the decade box to the controller.
Milliampere, Millivolt and Volts	• A calibrating device with at least ± 0.02 % accuracy for use as a signal source. • Two insulated copper leads for connecting the

Type of Input	Equipment Needed
	calibrator to the controller.
	• Place current source at zero before switching ON.
	• Do not switch current sources OFF/ON while connected to the UDC2800 input.

Input 1 Set up Wiring

Thermocouple Input using a Millivolt Source

See Figure Wiring Connections for Thermocouple Inputs using a Millivolt Source" and wire the controller according to the procedure given in Table "Set Up Wiring Procedure for Thermocouple Inputs using a Millivolt Source".

Table 6-3: Set Up Wiring Procedure for Thermocouple Inputs using a Millivolt Source

Step	Action
1	Connect the copper leads to the terminals for Input #1 as shown in the following figure "Wiring Connections for Thermocouple Inputs using a Millivolt Source".
	Connect a length of thermocouple extension wire to the end of each copper lead and insert the junction points into the ice bath.
	Connect the thermocouple extension wires to the terminals for Input #1. See the following figure.

Figure 6-2: Wiring Connections for Thermocouple Inputs using a Millivolt Source
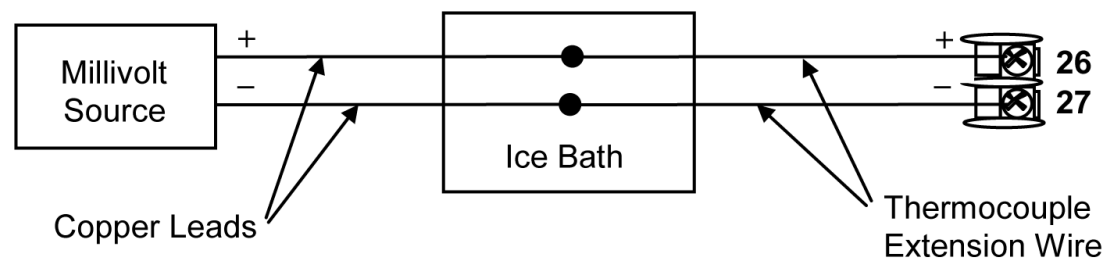
RTD Inputs

Refer to Input 1 Set up Wiring - and wire the controller according to the procedure given in Set Up Wiring Procedure for RTD Inputs.

Table 6-4: Set Up Wiring Procedure for RTD Inputs

Step	Action
1	Connect the copper leads from the calibrator to the Input #1 terminals as shown in figure Input 1 Set up Wiring .
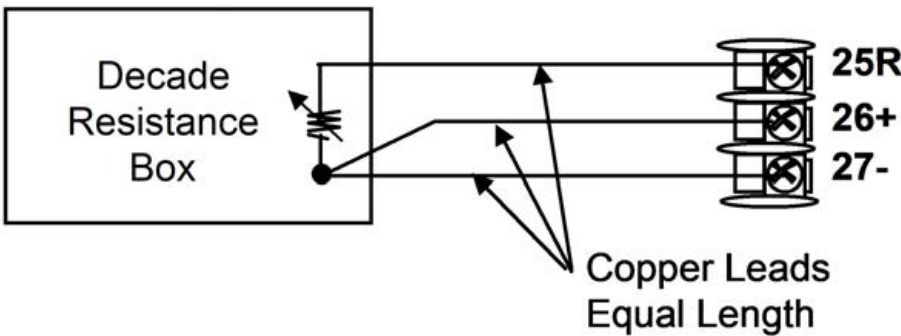
Figure 6-3: Wiring Connections for RTD (Resistance Thermometer Device)

Millivolts, Volts or Thermocouple Differential Inputs

See the following figure and wire the controller according to the procedure given in the following table.

Table 6-5: Wiring Connections for Thermocouple Differential, Millivolts or Volts
(Except 0 to 10 Volts)

Step	Action
1	Connect the copper leads from the calibrator to the Input #1 terminals as shown in figure Wiring Connections for Thermocouple Inputs using a Millivolt Source.
2	Place current/voltage source at zero before switching on.
3	Do not switch current/voltage source ON/OFF while connected to the instrument.

Milliamperes

Table 6-6: Set Up Wiring Procedure for Milliampere Inputs

Step	Action
1	Connect the copper leads from the calibrator to the Input #1 terminals as shown in Wiring Connections for 0 to 20 mA or 4 to 20 mA Inputs-.
2	Place current source at zero before switching on.
3	Do not switch current source ON/OFF while connected to the instrument.
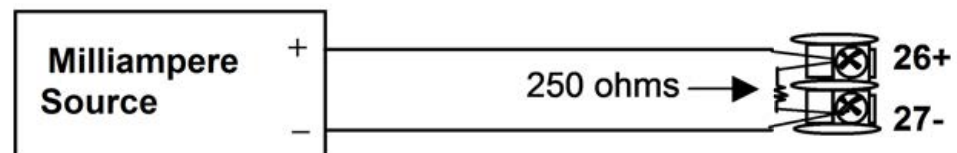
Figure 6-5: Wiring Connections for 0 to 20 mA or 4 to 20 mA Inputs

Input 1 Calibration Procedure

Preliminary Steps

- Apply power and allow the controller to warm up for 30 minutes before you calibrate.

- Before beginning the procedure, see Input 1 Set up Wiring for more information.

- Make sure you have set Lockout to NONE in the Security set up group. See Security Set Up Group for more information.

- See the table Voltage, Milliamp and Resistance Equivalents for Input Range Values for Voltage vs. Resistance equivalents or 0 % and 100 % range values.

> **CAUTION:** For linear inputs, avoid step changes in inputs. Vary smoothly from initial value to final 100 % value.

Procedure

The calibration procedure for Input #1 is listed in table below.

Table 6-7: Input 1 or 2 Calibration Procedure

Step	Operation	Press	Result
1	Enter Calibration Mode	Setup key	Enter into the setup mode.
		Increment key or Decrement key	Until you see "Input 1 Calib".
2	Enable Calibration function	Function key	Enter the first function prompt "Calibrate Input 1" of the Input 1 Calib set up group. Press the Function key again to enter the first configuration prompt of Calibrate Input N.
		Increment key or Decrement key	Until you see Begin.
		Function key	Enable the Calibration function At the completion of the sequence, the selection automatically reverts to disable.
3	Calibrate 0 %	Increment key or Decrement key	You will see Input N Zero (N=1 or 2) • Adjust your calibration device to an output signal equal to the 0 % range value for your particular input sensor. See the table Voltage, Milliamp and Resistance Equivalents for Input Range Values for Voltage, Degrees, or Resistance equivalents for 0 % range values. • Wait 15 seconds or press the function key twice, then go to the next step. **NOTE:** It is recommended to wait 15 seconds before pressing the function key for stable readings from the source.

Step	Operation	Press	Result

4	Calibrate 100 %	Increment key or Decrement key	You will see Input 1 Span.
			
			• Adjust your calibration device to an output signal equal to the 100 % range value for your particular input sensor. See the table Voltage, Milliamp and Resistance Equivalents for Input Range Values for Voltage, Degrees, or Resistance equivalents for 100 % range values.
			
			• Press the function key twice, and if
			
			  • you are calibrating a Thermocouple input, go to step 5.
			
			  • you are calibrating other than a Thermocouple input, go to step 6.
			
			NOTE: It is recommended to wait 15 seconds before pressing the function key for stable readings from the source.

5	Check the Cold Junction Temperature	Increment key or Decrement key	The calculations for zero and span are now stored, and you will see Cold Junction Temp 1: The value is in tenths of a degree. It is the current reading of the temperature as measured at the thermocouple terminals and recognized by the controller. You can change this value, if it is in error, using the Increment key or Decrement key. **NOTE:** Users must measure the temperature on the rear terminals before calibrating the Cold junction. **CAUTION:** The accuracy of the controller is directly affected by the accuracy of this value. It is recommended that this value not be changed under normal circumstances.
6	Exit the Calibration	Function key	The controller stores the calibration constants

Step	Operation	Press	Result
	Mode		
		Lower Display key	Exit the calibration mode.

Restore Input Factory Calibration

Introduction

The factory calibration constants for all the input actuation types that can be used with the controller are stored in its non-volatile memory. Thus, you can quickly restore the "Factory Calibration" for a given input actuation type by simply changing the actuation type to another type and then changing it back to the original type.

> **ATTENTION:** A restored factory calibration overwrites any previous field calibration done for the input and may change the High and Low Range Limits.
> Protect your field calibration from accidental overwrites by configuring the appropriate Lockout selection after calibration. See Configuration for more information.

Table 6-8: Restore Factory Calibration

Step	Operation	Press	Result
1	Set Lockout to None	Setup key	Until you see Security.
		Function key	Enter into the first function prompt Password of the Security set up group. Press the Function key again to enter the correct password. **ATTENTION:** Users must be careful while entering the password as the password is not hidden.
		Function key	You can see Lockout appears. Press the Function key again to enter into the configuration prompt of the Lockout.
		Increment key or Decrement key	Until you see None.
		Function key	Set Lockout to None.
2	Enter Input set up group	Setup key	Until you see Input 1.
		Function key	Enter into the first function prompt Input 1 Type of the Input set up group. Press the Function key again to enter into the configuration prompt of Input 1 Type.
		Increment key or Decrement key	To change the current selection to another selection.
3	Scroll through Functions	Function key	Until the lower display rolls through the rest of the functions and returns to Input 1 Type.
		Increment key or Decrement key	Until you change the input selection back to the proper selection.
4	Return to Normal	Lower Display key	Return to Normal operating mode.

Step	Operation	Press	Result
	Operation		The factory calibration will be restored. If the problem is not corrected, contact your Honeywell representative.

OUTPUT CALIBRATION

What's in this section?

The following topics are covered in this section.

In this section:

Overview

Introduction

This section describes the field calibration procedures for the Auxiliary Output.

> **WARNING:** OUTPUT CALIBRATION MAY REQUIRE ACCESS TO HAZARDOUS LIVE CIRCUITS, AND SHOULD ONLY BE PERFORMED BY QUALIFIED SERVICE PERSONNEL. MORE THAN ONE SWITCH MAY BE REQUIRED TO DE-ENERGIZE UNIT BEFORE CALIBRATION.

Auxiliary Output Calibration

Introduction

Calibrate the controller so that the auxiliary output provides the proper amount of current over the desired range. The controller can provide an auxiliary current output range of from 0 mA to 20 mA and can be calibrated at 4 mA for 0 % of output and 20 mA for 100 % of output or any other values between 0 mA and 21 mA.

Equipment Needed

You will need a calibrating device with whatever accuracy is required, capable of measuring 0 to 20 mA.

Calibrator Connections

See the figure Wiring Connections for Calibrating Auxiliary Output– and wire the controller according to the procedure given in Set Up Wiring Procedure for Auxiliary Output–.

Table 7–1: Set Up Wiring Procedure for Auxiliary Output

Step	Action
1	Apply power and allow the controller to warm up 30 minutes before you calibrate.

Step	Action
2	Set LOCK in the Tuning Set Up group to NONE.
3	Tag and disconnect the field wiring, at the rear of the controller, from terminals 12 (+) and 13 (−). See Wiring Connections for Calibrating Auxiliary Output.
4	Connect a milliammeter across these terminals.
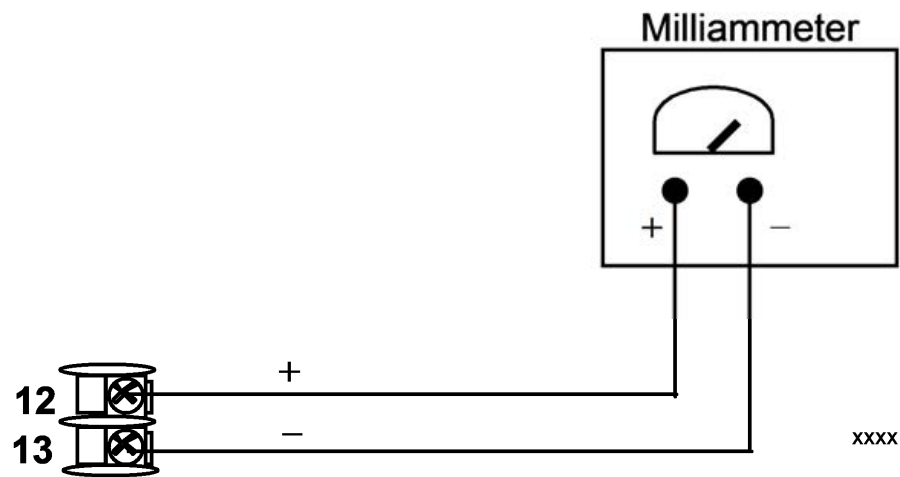
Figure 7-1: Wiring Connections for Calibrating Auxiliary Output

Procedure

The procedure for calibrating the auxiliary output is listed in the following table

Make sure Lockout in the security group set to "NONE" See Security Set Up Group for more information.

Table 7-2: Auxiliary Output Calibration Procedure

Step	Operation	Press	Result
1	Enter Calibration Mode	Setup key	Enter into the Setup mode.
		Setup key or Increment key or Decrement key	Until you see Auxiliary Calib.
2	Calibrate 0 %	Function key	Enter into the first function prompt Zero Value of the Auxiliary Calib set up group. Press the Function key again to enter the configuration prompt of Zero Value.
		Increment key or Decrement key	Until the desired 0 % output is read on the milliammeter. Normally, this will be the setting that produces 4 mA. If tuning Zero Value of 0-20 mA output type, the output should be tuned to non-zero value first, and then tuned back to the edge. The edge means that the output will be greater than 0 mA when the Increment key is pressed, and the output will still be 0 mA when the Decrement key is pressed.
3	Calibrate 100 %	Function key	To store the 0 % value.
		Increment key or Decrement key	Until you see Span Value.
		Function key	Enter into the configuration prompt of Span Value.
		Increment key or Decrement key	Until the desired 100 % output is read on the milliammeter. Normally, this will be the setting that produces 20 mA.
4	Exit the Calibration Mode	Function key	The controller stores the span value.
		Lower	To exit the calibration mode.

Step	Operation	Press	Result
		Display key	

Restore Output Factory Calibration

Introduction

The factory calibration constants for the Current and Auxiliary Outputs are stored in its non-volatile memory. Thus, you can quickly restore the "Factory Calibration" for those outputs by simply changing the CO Range setting for that output to the other setting and then changing it back to the original type.

See table below for procedure.

> **ATTENTION:** A restored factory calibration overwrites any previous field calibration done for the output. Protect your field calibration from accidental overwrites by configuring the appropriate LOCKOUT selection after calibration. See Configuration for more information.

Table 7-3: Restore Factory Calibration

Step	Operation	Press	Result
1	Select Lockout to None	Setup key	Until you see Security.
		Function key	Enter into the first function prompt Password of the Security set up group. Press the Function key again to enter the correct password. **ATTENTION:** Users must be careful while entering the password as the password is not hidden.
		Function key	You can see Lockout appears. Press the Function key again to enter into the configuration prompt of the Lockout.
		Increment key or Decrement key	Until you see None.
		Function key	Set Lockout to None.
2	Enter Options set up Group	Setup key	Until you see Options. Options is for the Auxiliary Output.
		Function key	Enter into the first function prompt of the Output or Options set up group.
		Increment key or Decrement key	Until you see CO Range.
		Function key	Enter into the first configuration prompt of the Output or Options set up group.
		Increment key or Decrement key	To change the range configuration to the other selection
3	Scroll through Functions	Function key	Until the lower display rolls through the rest of the functions and returns to Co Range.
		Increment key or Decrement key	To change the range selection in the upper display back to the proper selection.
4	Return to Normal Operation	Lower Display key	Return to Normal operating mode. The factory calibration will be restored. If the problem is not corrected, contact your

Step	Operation	Press	Result
			Honeywell representative.

8

TROUBLESHOOTING/SERVICE

What's in this section?

The following topics are covered in this section.

In this section:

Overview

Introduction

Instrument performance can be adversely affected by installation and application problems as well as by hardware problems. We recommend that you investigate the problems in the following order:

- installation related problems
- application related problems
- hardware and software related problems

and use the information presented in this section to solve them.

Installation related problems

Read the Installation section in this manual to make sure the UDC2800 has been properly installed. The installation section provides information on protection against electrical noise, connecting external equipment to the controller, and shielding and routing external wiring.

> **ATTENTION:** System noise induced into the controller will result in diagnostic error messages recurring. If the diagnostic error messages can be cleared, it indicates a "soft" failure and is probably noise related.

If system noise is suspected, completely isolate the controller from all field wiring. Use calibration sources to simulate PV and check controller functions of limit and alarms.

Application related problems

Review the application of the controller; then, if necessary, direct your questions to the local sales office.

Hardware and software related problems

Use the troubleshooting error message prompts and controller failure symptoms to identify typical failures which may occur in the controller. Follow the troubleshooting procedures to correct them.

Troubleshooting Aids

Overall error messages

An error message can occur:

- ■ At power-up. See Power-up Tests for more information.

- ■ When the Status Tests are requested. See Status Tests for more information.

- ■ During continuous background tests while in normal operation. See Background Tests and Diagnostic for more information.

Controller failure symptoms

Other failures may occur that deal with the Power, Output, or Alarms. Refer to the controller failure symptom in Table Controller Failure Symptoms to determine what is wrong and the troubleshooting procedures to use to correct the problem.

Check installation

If a set of symptoms still persists, ensure proper installation and proper use of the controller in the system. See Installation for more information.

Customer support

If you cannot solve the problem using the troubleshooting procedures listed in this section, you can get technical assistance by dialing 1-800-423-9883 USA and Canada.

An engineer will discuss your problem with you. Please have your complete model number, serial number, and Software version available. The model and serial numbers can be found on the chassis nameplate. The software version can be viewed under Setup Group "Status." See Table Procedure for Identifying the Software Version.

If it is determined that a hardware problem exists, a replacement controller or part will be shipped with instructions for returning the defective unit.

Do not return your controller without authorization from Honeywell's Technical Assistance Center or until the replacement has been received.

Check out Honeywell's web site at http://www.honeywell.com/imc.

Determining the software version

Table below lists the procedure for identifying the software version number.

Table 8-1: Procedure for Identifying the Software Version

Step	Operation	Press	Result
1	Select Status set up group	Setup key	Until you see Status.
2	Read the software version	Function key	Enter into the first function prompt Software Version of the Status set up group. You can see the software version then. Please give this number to the Customer Support person. It will indicate which version of UDC2800 you have and help them determine a solution to your problem.

Power-up Tests

What happens at power-up

When power is applied, the controller will run several diagnostic tests, including RAM test and EEPROM test. After these tests are completed, "Success" is displayed.

Failsafe Failures

If one or more of these tests fail, the controller will go to the Failsafe Mode, and FailSafe will flash in the diagnostics display and a message indicating which test failed will appear in the diagnostic display.

Status Tests

Introduction

When required, the results of these tests can be checked to determine the reason the controller has gone to Failsafe.

How to check the status tests

The procedure in table below tells you how to display the results of the status tests.

Table 8-2: Procedure for Displaying the Status Test Results

Step	Operation	Press	Result
1	Select Status set up group	Setup key	Until you see Status.
2	Read the test results	Function key	Enter into the first function prompt Software Version of the Status set up group.
		Increment key or Decrement key	Until you see Failsafe Status. You can see the Failsafe status, No or Yes. Yes, indicates a failure.
		Increment key or Decrement key	Until you see Self Tests. You can see the status of Self Tests, Pass or Fail.

Background Tests and Diagnostic

Introduction

This instrument performs ongoing background tests to verify data and memory integrity. If there is a malfunction, a diagnostic message will be displayed (blinking) in the diagnostics display.

In the case of simultaneous malfunctions, the messages will appear in sequence in the diagnostics display. Table below lists these background tests, the reason for their failure, and how to correct the problem.

Table 8-3: Background Tests

Lower Display	Reason for Failure	How to Correct the Problem
RAM Error	RAM test failed at start up.	1. Run through STATUS check to determine the reason for the failure. 2. Run through the STATUS check a second time to see if the error cleared. 3. Power cycle the instrument. If the message reappears, replace the instrument.
EEPROM Error	Unable to write to non-volatile memory. Anytime you change a parameter, and it is not accepted, you will see EEPROM Error.	1. Check the accuracy of the parameter and re-enter. 2. Try to change something else in configuration. 3. Run through Read STATUS tests to re-write to EEPROM. 4. Run through the STATUS check a second time to see if the error cleared. If error did not clear, then power cycle the instrument. If the message reappears, replace the instrument.

Lower Display	Reason for Failure	How to Correct the Problem
Calibration Test Error	Calibration test failed at start up.	1. Run through STATUS check to determine the reason for the failure. 2. Restore factory settings. See Restoring Factory Configuration for more information. 3. Power cycle the instrument. If the message reappears, replace the instrument.
Configuration Error	It appears when one of the following conditions is happened: • PV low limit is > PV high limit • SP low limit is > SP high limit • Output low limit > Output high limit	Check the configuration for each item and reconfigure if necessary.
Config Test Error	Calculated checksum is mismatched with the checksum in EEPROM.	Restore the instrument.
Failsafe	This error message shows whenever the controller goes into a failsafe mode of operation. This will happen if: • RAM test failed • Configuration test failed • Calibration test failed • Burnout is configured for none, and the input failed.	1. Run through STATUS check to determine the reason for the failure. 2. Press the Setup and Increment key until Status appears. 3. Press the Function key to see whether the tests pass or fail, then run through the Status codes a second time to see if the error cleared.
Input 1 Range	Input 1 out of range. The	1. Make sure the range and

Lower Display	Reason for Failure	How to Correct the Problem
	process input is outside the range limits.	actuation are configured properly. 2. Check the input source. 3. Restore the factory calibration. (See Restore Input Factory Calibration for more information.) 4. Field calibrate. See Input Calibration for more information.
Input 1 Fail	Two consecutive failures of input 1 integration, i.e., cannot make analog to digital conversion. This will happen if: • Upscale or Downscale burnout is selected, and the input is open • Input not configured correctly for the sensor being used • Calibration test failed • Input source is grossly out of range.	1. Make sure the actuation is configured correctly. See Configuration for more information. 2. Make sure the input is correct and that it has not burned-out (opened). 3. Check for gross over-ranging with a multimeter 4. Restore factory calibration. See Restore Input Factory Calibration for more information.
PV Limit	PV in engineering unit (with ratio and bias) is out of limit. PV limit is same as burnout high/low limit, Linear ±10%, TC/RTD ±1%, Input Algorithm 0%. PV = Input 1 x Ratio 1 + Input 1 BIAS	1. Make sure the input signal is correct. 2. Make sure the Ratio and Bias settings are correct. 3. Recheck the calibration. Use Bias of 0.0.
Slidewire Calib	1. Input 2 Type is configured as	Field Calibrate the slidewire. See Position Proportional and Three

Lower Display	Reason for Failure	How to Correct the Problem
	Slidewire. 2. Slidewire calibration never performed.	Position Step Output Calibration for more information.
Slidewire Fail	1. Input 2 Type is configured as Slidewire. 2. Position Proportional slidewire input failure.	See Troubleshooting Procedures for more information.
TC 1 Warning	Thermocouple on Input 1 is starting to burn out.	This diagnostic message means that the controller has detected that the thermocouple is starting to burn out. This error message may also be created if the resistance of the wires used to connect the thermocouple to the instrument is above 1000 ohms.
TC 1 Fail	Thermocouple on Input 1 is in imminent danger of burning out.	This diagnostic message means that the controller has detected that the thermocouple will soon fail. User should consider replacing the thermocouple as soon as possible. This message will also be generated if the resistance of the wires used to connect the thermocouple to the instrument is above 2000 ohms.
Output 2 Fail	Auxiliary Output is configured as 4-20mA, and Auxiliary Output is less than 3.5 mA.	The auxiliary output is open circuit. Check the field wiring. See Procedure #9.

Controller Failure Symptoms

Introduction

In addition to the error message prompts, there are failure symptoms that can be identified by noting how the controller displays and indicators are reacting.

Symptoms

Compare your symptoms with those shown in table below.

Table 8-4: Controller Failure Symptoms

Upper Display	Lower Display	Indicators	Controller Output	Probable Cause	Troubleshooting Procedure
Blank	Blank	Off	None	Power Failure	1
OK	OK	OK	External Alarm function does not operate properly	Malfunction in alarm output	2
OK	Displayed Output disagrees with Controller Output	OK	Controller Output disagrees with Displayed Output	Position Proportional or TPSC Output	3
Display does not change when a key is pressed				Keyboard Malfunction	4
Controller fails to go into "Slave" operation during communications				Communications Failure	5
OK	Displayed Output disagrees with Auxiliary Output	OK	Controller Auxiliary Output disagrees with Displayed Auxiliary	Auxiliary Output	6

Upper Display	Lower Display	Indicators	Controller Output	Probable Cause	Troubleshooting Procedure
			Output		

Other symptoms

If a set of symptoms or prompts other than the one you started with appears while troubleshooting, re-evaluate the symptoms. This may lead to a different troubleshooting procedure.

If the symptom still persists, refer to the installation section in this manual to ensure proper installation and proper use of the controller in your system.

Troubleshooting Procedures

Introduction

The troubleshooting procedures are listed in numerical order as they appear in Table "Controller Failure Symptoms". Each procedure lists what to do if you have that particular failure and how to do it or where to find the data needed to accomplish the task.

> **WARNING:** TROUBLESHOOTING MAY REQUIRE ACCESS TO HAZARDOUS LIVE CIRCUITS, AND SHOULD ONLY BE PERFORMED BY QUALIFIED SERVICE PERSONNEL. MORE THAN ONE SWITCH MAY BE REQUIRED TO DEENERGIZE UNIT BEFORE SERVICING.

Equipment needed

You will need the following equipment in order to troubleshoot the symptoms listed in the tables that follow:

- Multimeter – Capable of measuring millivolts, milliamps and resistance.
- Calibration sources – T/C, mV, Volt, etc.

Procedure #1

This table explains how to troubleshoot power failure symptoms.

Table 8-5: Troubleshooting Power Failure Symptoms

Step	What to do	How to do it
1	Check the AC line voltage.	Use a voltmeter to measure the AC voltage across terminals L1 and L2 on the rear terminal panel of the controller. Check the earth ground connection.
2	Make sure the chassis plugs into the rear of the case properly.	Withdraw the chassis and visually inspect the controller board and the inside of the case.
3	Check the system for Brown-outs, heavy load switching, etc., and conformance to installation instructions.	See Section - Installation.
4	Change Power board.	Installation instructions supplied with new board.

Procedure #2

This table explains how to troubleshoot Alarm Relay Output failure.

Table 8-6: Troubleshooting Alarm Relay Output Failure

Step	What to do	How to do it
1	Check the alarm configuration data. If it is correct, check the field wiring.	Reconfigure if necessary. See Configuration for more information.
2	Check that the applicable alarm relay actuates properly depending on what you have set at prompt AxSx TYPE. If it does, check the field wiring.	If the alarm type is set for PV, vary the input to raise and lower the PV around the setpoint. Listen for a click from the relay as the PV moves in either direction and note that the proper ALM1 or ALM2 is lit. EXAMPLE: If the alarm is set to failsafe, disconnect the input 1 wire from the controller terminals. user will notice that the alarm light is ON. Connect back the input wires properly then the alarm light will be OFF.
3	Check the contacts.	Make sure the NO or NC contact wiring is correct.

Step	What to do	How to do it
		See Installation for more information.
4	Change the relay and/or the current output board.	Installation instructions supplied with the new relay or board.
5	Change MCU board.	Installation instructions supplied with the new board.

Procedure #3

This table explains how to troubleshoot a Keyboard failure.

Table 8-7: Troubleshooting a Keyboard Failure

Step	What to do	How to do it
1	Make sure the keyboard is connected properly to the MCU/output and power/input boards.	Withdraw the chassis from the case and visually inspect the connection.
2	Controller Keyboard or specific keys may be LOCKED OUT via the security code.	Use your four-digit security code number to change the lockout level. See Configuration for more information.
3	Run the keyboard test.	Press the Setup key and hold in, then press the Function key at the same time. The controller will run a display test. Then you will see Try keys in the Lower Display. Press each key. If it works, the key name will appear in the Lower Display.
4	Replace the display/keyboard if any keys do not function.	See "Parts Replacement Procedures" in this section.

Procedure #4

This table explains how to troubleshoot a RS 485 Communications failure.

Table 8-8: Troubleshooting a RS-485 Communications Failure

Step	What to do	How to do it
1	Check the Address Number, ComState and Baud Rate settings.	See Communications Group for more information.
2	Check the field wiring and termination resistor.	Using an ohm meter, check the resistance across the communications rear terminals. See Section for wiring diagrams.

Step	What to do	How to do it
3	Make sure the Communications Printed Wiring Board is installed properly in the controller.	Withdraw the chassis from the case and inspect the board. See the exploded view for location of the board. Return the chassis to the case.
4	Determine if the Communications board is faulty by running a Local Loopback Test. If the test fails, replace the board. If the test passes, the problem is most likely elsewhere in the communications network.	Disconnect the communications cable from the rear terminals. Run the Local Loopback Test. Press the Setup key until you see Communication. Press the Function key to enter in the first function prompt of the Communication set up group. Press Increment key or Decrement key until you see Local Loopback. Press the Function key to enter in the configuration prompt of Local Loopback. Press Increment key or Decrement key until you see Enable. The test will run until the operator disables it here.

Procedure #5

This table explains how to troubleshoot an Ethernet Communications failure.

Table 8-9: Troubleshooting an Ethernet Communications Failure

Step	What to do	How to do it
1	Check the IP address, Subnet Mask address and Gateway address settings.	See Communication set up group and Honeywell EasySet.
2	Check if the	The Ethernet symbol:

Step	What to do	How to do it
	Ethernet Connection is active.	• Is **red** when there is no Ethernet connection. • Is **solid White** when there is an Ethernet connection, but no data exchange. • Is **white and blinks once per second** when there is an Ethernet connection and data exchange.
3	Change Ethernet Communications board.	Installation instructions provided with new board.
4	Change Controller	

Procedure #6

This table explains how to troubleshoot Auxiliary Output failure symptoms.

Table 8-10: Troubleshooting Auxiliary Output Failure

Step	What to do	How to do it
1	Make sure the controller is configured for Auxiliary Output and the proper range (4 to 20 or 0 to 20) is configured.	Make Options set up group function prompt Auxiliary Output any selection other than Disable. Make the Options Set UP group function prompt CO Range = 4–20 or 0–20 per your application. See Configuration for more information.
2	Check the field wiring.	Output impedance must be less than or equal to 1000 ohms.
3	Check the output.	Change the Auxiliary Output selection to SP and then change the SP from 0 % to 100 % (4-20 mA). Use a DC milliammeter at the rear terminals to verify the output.
4	Recalibrate the Auxiliary output.	See Output Calibration for more information.
5	Change Auxiliary Output board.	Installation instructions provided with new board.

Step	What to do	How to do it
6	Change Controller	

Restoring Factory Configuration

Introduction

This procedure restores the configuration of the instrument back to the Factory Settings. See Configuration Record Sheet for more information.

> **ATTENTION:** Restoring the factory configuration overwrites all user–entered configuration changes. This procedure cannot be undone, it is a one-way process.

Table 8-11: Restoring Factory Configuration

Step	Operation	Press	Result
1	Enter Security set up group	Setup key	Enter into the Setup mode.
		Setup key or Increment key or Decrement key	Until you see Security.
2	Enter Security Code	Function key	Enter into the first function prompt Password of Security set up group. Press the Function key again to the password configuration.
		Increment key or Decrement key	Enter the correct password. **ATTENTION:** Users must be careful while entering the password as the password is not hidden.

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Step	Operation	Press	Result
3	Enter Restoring Settings	Function key	The Lockout function prompt appears.
		Increment key or Decrement key	Until you see Restoring Settings.
		Function key	Enter into the configuration prompt of Restoring Settings.
		Increment key or Decrement key	Until you see Enable.
		Function key	A dialog appears asking you are sure to restore the settings. Configuration will be restored in 5 seconds.
			You can press the Lower Display key to cancel the restore within 5 seconds.
			When the instrument finishes the restore operation, it automatically resets itself and restarts. It is required to change the password. See Start Up Procedure for Operation for more information.
			The instrument configuration is now the same as it was when it left the factory, and all user-entered configurations since that time have been overwritten.

9

PARTS LIST

What's in this section?

The following topics are covered in this section.
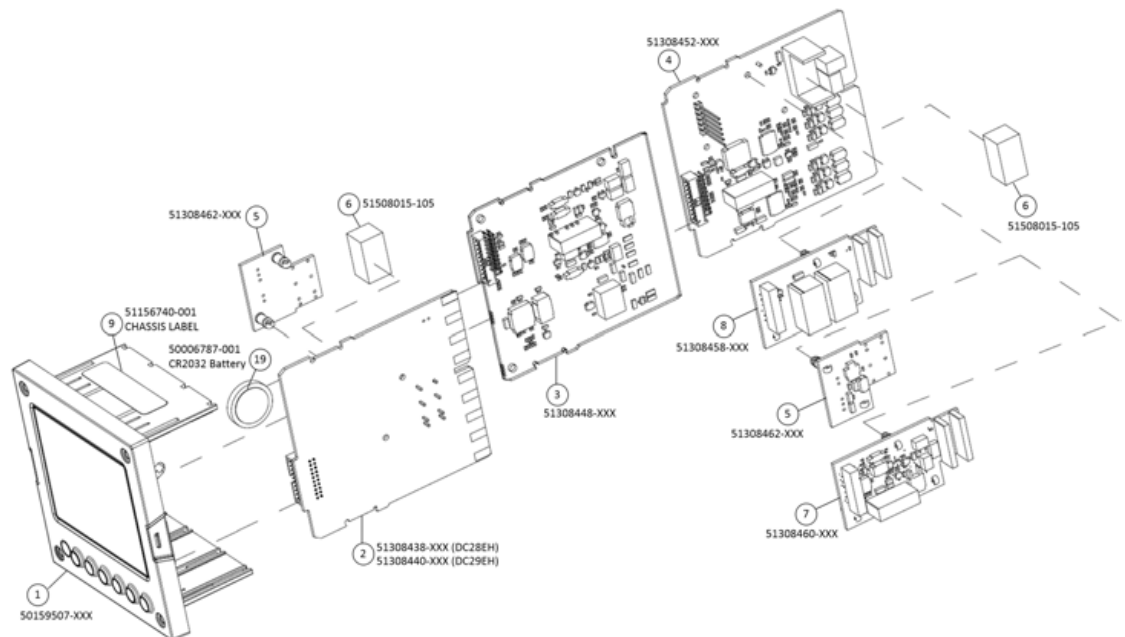
In this section:

Exploded View

Introduction

This figure shows an exploded view of the UDC2800 Controller. Each part is labeled with a key number. The part numbers are listed by key number in table Parts Identification.

> **NOTE:** Not all parts are standard.
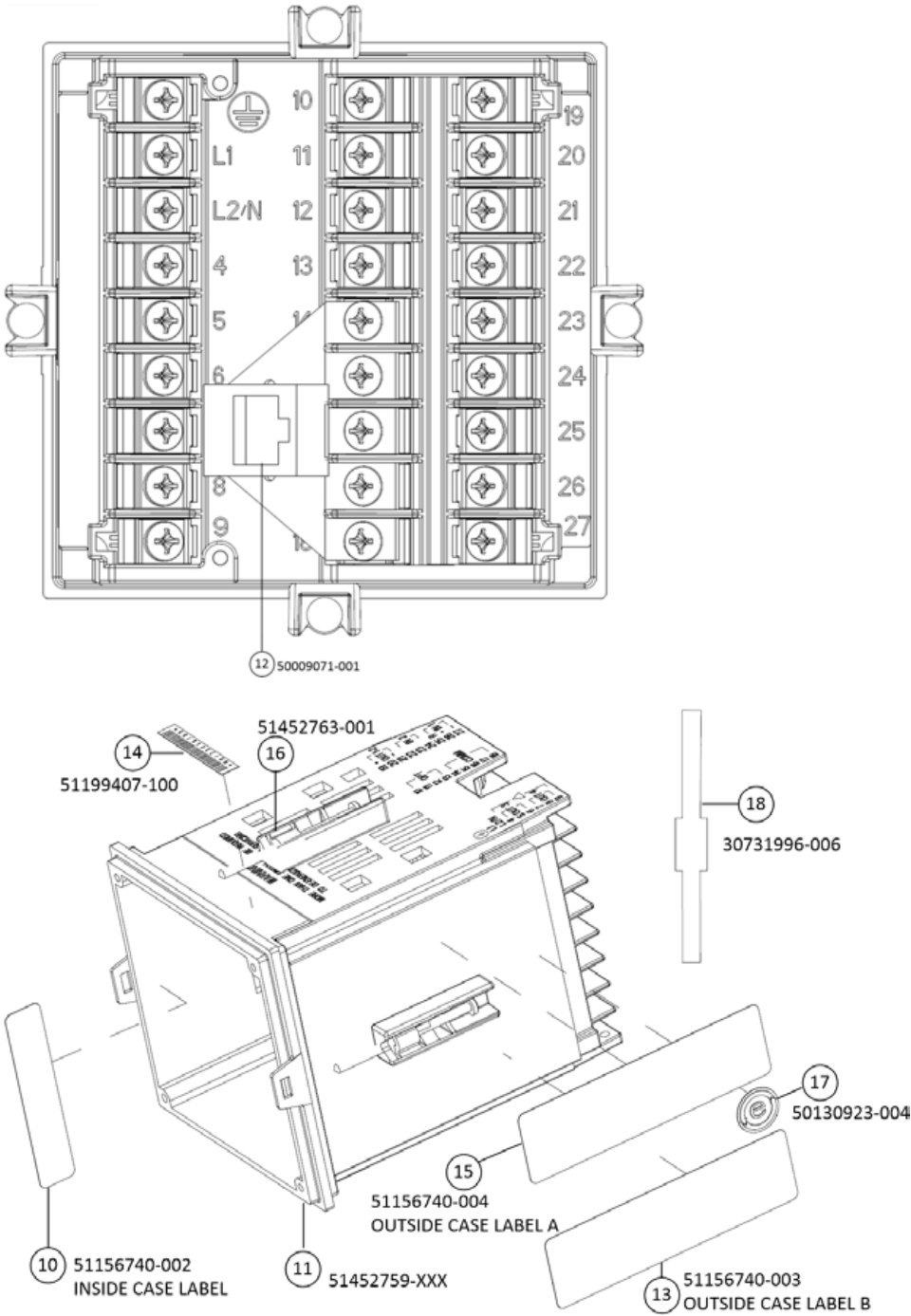
> **ATTENTION:** Internal parts of the product must be replaced and maintained by Honeywell representative.

Figure 9-1: UDC2800 Exploded View

(12) 50009071-001

51452763-001

(14) 51199407-100

(16)

(18) 30731996-006

(17) 50130923-004

(15) 51156740-004
OUTSIDE CASE LABEL A

(10) 51156740-002
INSIDE CASE LABEL

(11) 51452759-XXX

(13) 51156740-003
OUTSIDE CASE LABEL B

Table 9-1: Parts Identification

Key Number	Part Number	Description
1	50159507-501	Front panel assembly, UDC 2800/2900
2	51308438-528	Power/Output PWA without E-M Relays (90-264 Vac Operation)
	51308438-529	Power/Output PWA with E-M Relays (90-264 Vac Operation)
	51308440-526	Power/Output PWA with E-M Relays (24 Vac/dc Operation)
3	51308448-526	Auxiliary Output/Digital Input PWA
	51308448-527	Auxiliary Output/Digital Input/RS-422/485 Communications PWA
	51308448-528	Auxiliary Output/Digital Input/Ethernet Communications PWA
4	51308452-526	Analog Input/Control Output (1ch AI), PWA
	51308452-527	Analog Input/Control Output (2ch AI), PWA
5	51308462-526	Open Collector Output (TPS) PWA
6	51508015-505	Electro-Mechanical Relay
7	51308460-526	Current Output PWA
8	51308458-526	Dual Electromechanical Relay PWA
9	51156740-001	Chassis Label
10	51156740-002	Inside Case Label
11	51452759-501	Case Assembly (including Mounting Kit with four brackets)
12	50009071-501	Ethernet Adaptor Board Kit PWA
13	51156740-003	Outside Case Label B
14	51199407-100	Label, Module Barcode
15	51156740-004	Outside Case Label A
16	51452763-501	Mounting Kits (12 brackets & screws)
17	50130923-004	China RoHS 2 Label, Compliant

Key Number	Part Number	Description
18	30731996-506	4-20 mA Input Resistor Assembly (250 ohm)
19	50006787-001	CR2032 Battery. Battery is installed in MCU display. For more information, see the following figures. **NOTE:** Battery is not used for the current release.

Figure 9-2: 50159507 Exploded View
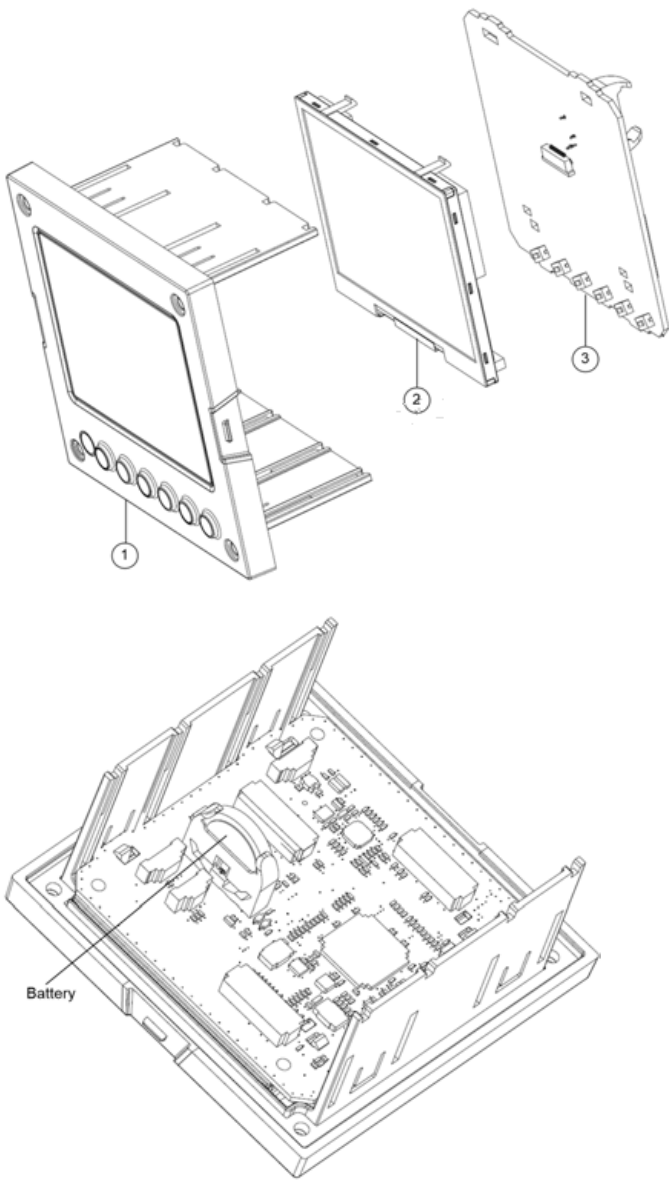
Key Number	Part Number	Description
1	50150597-501	CHASSIS ASSEMBLY, UDC
2	50152823-501	TFT-LCD module for UDC2800, CTM320240N01
3	51308456-526	MCU/Display PWA

Removing the chassis

Using a thin screwdriver, gently twist the screwdriver to pry the side tabs from the front face. Pry just enough to release it, otherwise you'll bend or break the tab. If you break or bend the tab and can't reattach the front snugly, you'll need to reattach the front using the 4 NEMA4 screws provided. See Mounting for more information.

> **WARNING:** Do not put your fingers inside the case to touch rail terminals to avoid electric shock.

10 CONFIGURATION VIA HONEYWELL EASYSET

What's in this section?

The following topics are covered in this section.

Overview

Honeywell EasySet app lets users configure their instrument (Non-FM) on a Mobile Device via Bluetooth. It is available to detect and connect controllers within 3 meters.

This app can be installed on IOS 12.0 and Android 9 or higher operating system.

> **ATTENTION:** Before using the EasySet app on an Android device, it is recommended to install and keep all Android security updates up-to-date.

> **NOTE:** It is recommended to use the default keyboard when using the EasySet app on an Android device.

> **NOTE:** It is recommended to use the Honeywell EasySet app on 5 inch and above screen size iOS mobiles for a better experience.

The configurations are accessed using icons introduced below.
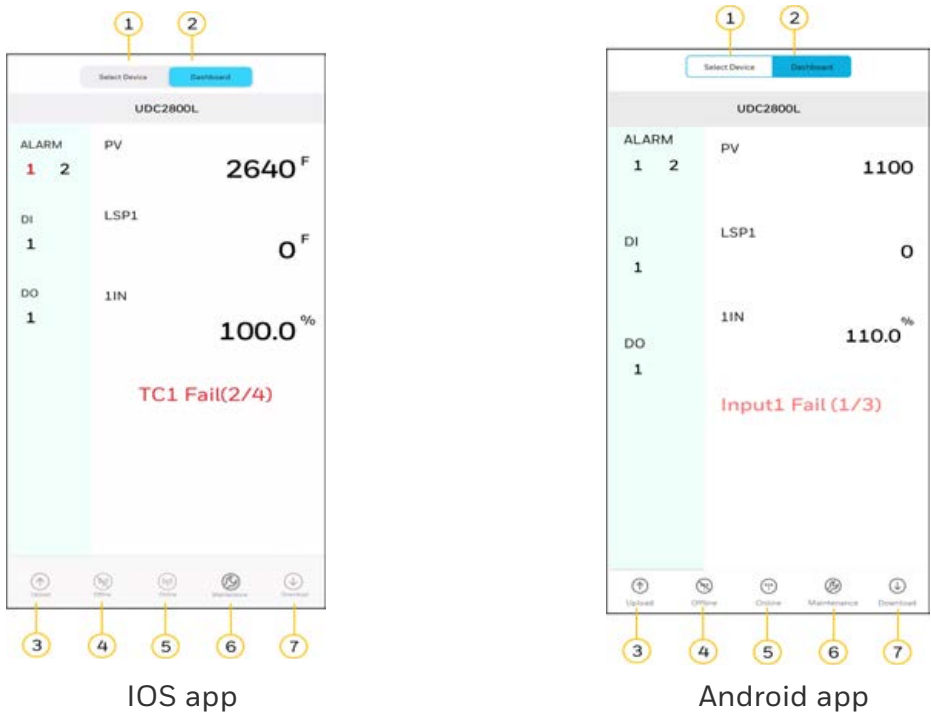
Figure 10-1: Honeywell EasySet interface

IOS app   Android app

Table 10-1: Description of icons

| Item	Description
1	The Select Device Tab shows list of available UDC devices. It is used to set up communications before uploading or downloading instrument configurations. See Communications Setup for more information.
2	The Dashboard is used to configure & operate controllers and download/upload the complete configuration. **NOTE:** The displayed data on the Dashboard page refreshes every 10 seconds.
3	The Upload tab is used to upload instrument configuration to Mobile Device. See Upload Configuration for more information.
4	The Offline tab is used to edit an instrument configuration for later downloading. See Offline Configuration for more information.
5	The Online tab is used to edit and download one instrument settings at a time. See Online Configuration for more information.
6	The Maintenance tab displays key operating parameters and status parameters of the instrument without switching between the instrument screens. Some of the information presented here is not visible through the instrument display panel. Used primarily for diagnostics. See Maintenance Data for more information.
7	The Download tab is used to download an instrument configuration to an instrument. See Download for more information.

Communications Setup

Before transferring the data between the EasySet app and instrument, the user must set up the mobile device communication parameters using following procedure.

1. Open the EasySet app. The Bluetooth permission pop-up appears.
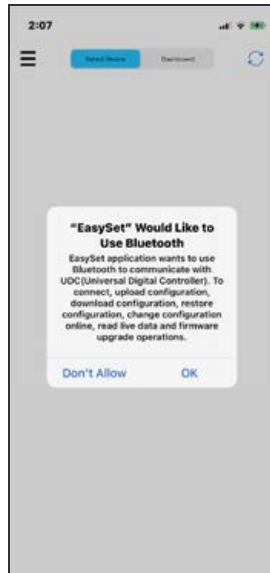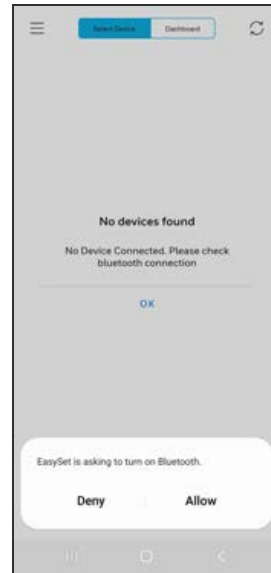
IOS app   Android app

NOTE: In Android device, if the Easyset app opened for the first time, users need to allow **Location** access permission. It is recommenced to choose Precise location for better results.
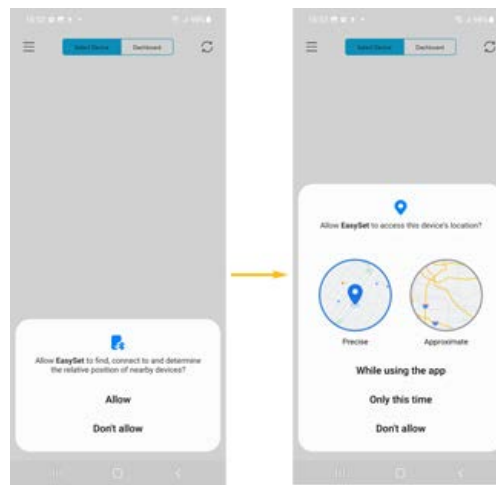
2. Perform the following:

- In IOS device, Click **OK**.

- In Android devices, Click **Allow**.

3. Click **Select Device**, all available controllers are detected and displayed with Bluetooth IDs.
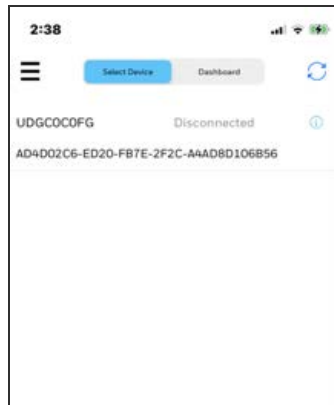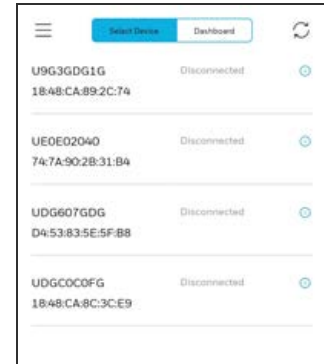
IOS app   Android app

> **NOTE:** The UDC device's **Bluetooth ID** appears in the communications group on the controller screen.

> **NOTE:** If the required controller is not listed, click the **Refresh** icon to refresh the page.

4. Select the desired controller to connect, the connect dialog appears.
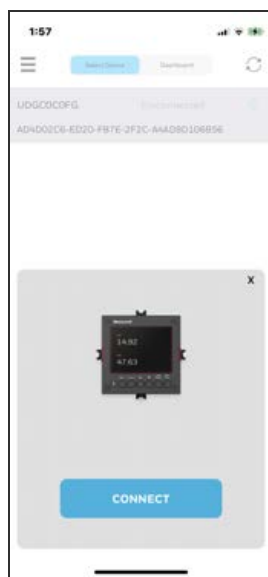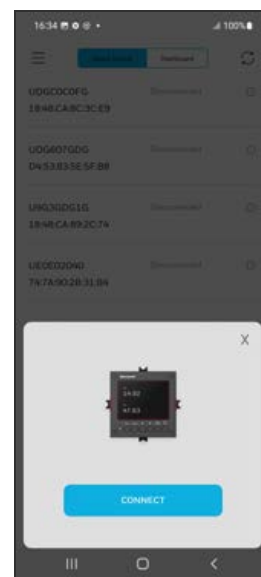
IOS app   Android app

5. Click **CONNECT**, Bluetooth pairing request dialog appears.

> **NOTE:** The UDC device displays a pairing code. Record the code.

6. Enter the UDC device pairing code, and then click **Pair**.
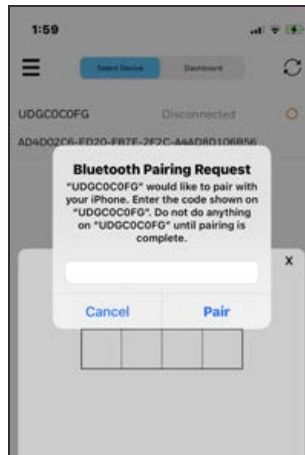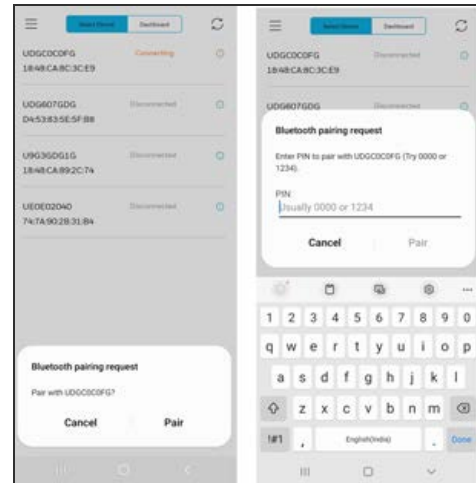
IOS app   Android app

7. Once Bluetooth pair is success, enter a PIN dialog appears.

8. Enter the UDC device PIN.

   - The entered PIN is valid, and **Success** dialog appears.

   - The entered PIN is not valid, and **Login failed** dialog appears. Check the device password try again.

> **ATTENTION:** Enter the four digit UDC device PIN in the EasySet app to login.
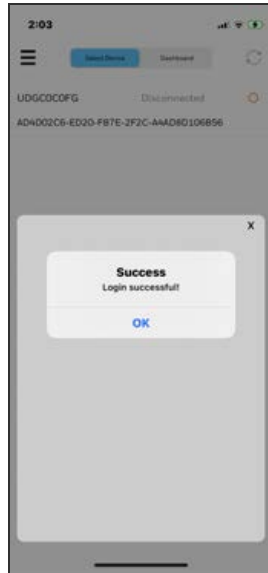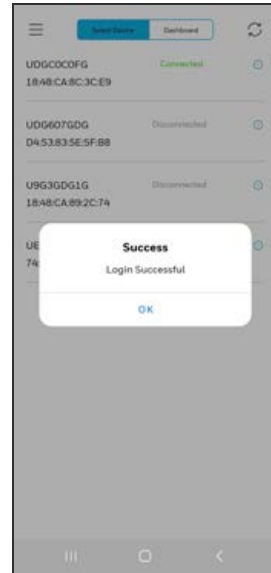
IOS app	Android app

9. Click **OK**.
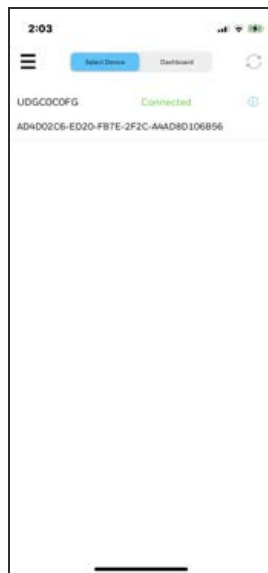
IOS app	Android app

> **ATTENTION:** Once the UDC device is connected to the EasySet app through Bluetooth, do not disable or turn off the Bluetooth function in the UDC device.

> **NOTE:** The user must disconnect the current device from the EasySet app before connecting to the new device.

> **ATTENTION:** The EasySet app does not allow the user to connect to new devices if a UDC device is paired with the app but the PIN is not entered. In this instance, the user must either close the app or enter the PIN to log in.

Upload Configuration

Using Upload Configuration user can upload the instrument's configuration into the EasySet app, where user can save, edit, and download the configurations back to the instrument or other instruments.

1. Click **Dashboard**. The dashboard page appears.
2. Click **Upload**. The **Upload Configuration** page appears.

IOS app   Android app

3. Click **Start** to begin upload. The status of upload (% complete) is shown.
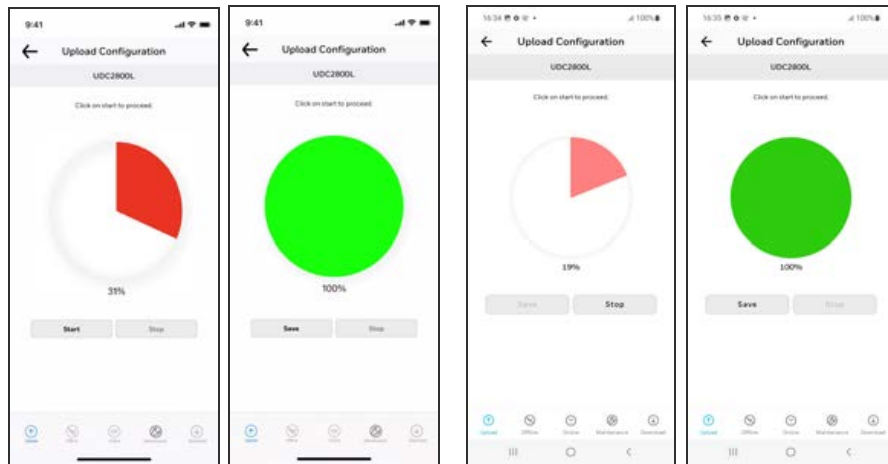
IOS app   Android app

> **NOTE:** To terminate upload, click **Stop**.

If upload is successful, Users can save the configuration.

4. Click **Save**, and enter the **File Name** and **Description**.

IOS app   Android app

5. Click **Save**. The configuration is saved in the mobile device.

> **NOTE:** If do not want to save the configuration, click **Cancel**.

Offline Configuration

Offline Configuration lets users to edit an instrument's configuration file for later downloading to the instrument. This operation is mostly used for initial configuration, where the configuration from one instrument is copied, duplicated, or modified and then downloaded to other instruments.

1. Click **Dashboard**. The dashboard page appears.
2. Click **Offline**. The **Offline Configuration** page appears.

| IOS app | Android app |

3. Select **Device Type** and **File List**.

Item	Description
Device Type	Select the device type whose configuration you want to edit, e.g. UDC2800.
File List	Previously saved configuration files are shown.
Model Type	Based on the device type model type can be selected.

4. Click **Open File**, the offline configuration page appears.
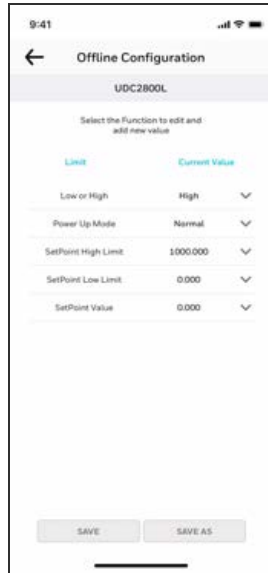
IOS app   Android app

5. Select a group and edit configurations.

> **NOTE:** The groups are organized exactly as on the instrument itself.
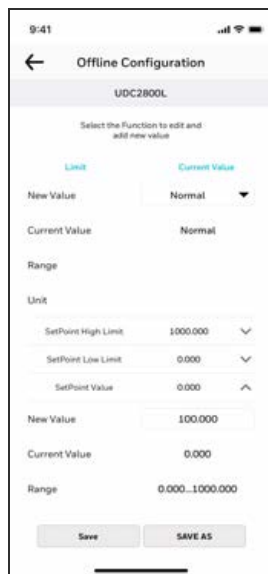
IOS app   Android app

If an analog configuration is highlighted with red text or a digital configuration is shown blank, it means that the stored value is now out of range, either because of previous changes to the instrument's configuration or because of incompatibilities with the configuration set. Change the configuration to an in-range setting to correct the error.

> **NOTE: Save** or **SAVE AS** options are enabled only if any configuration changes happen.

After finishing the configuration:

- Click **Save.** The **Success** dialog appears, and then click **OK.**
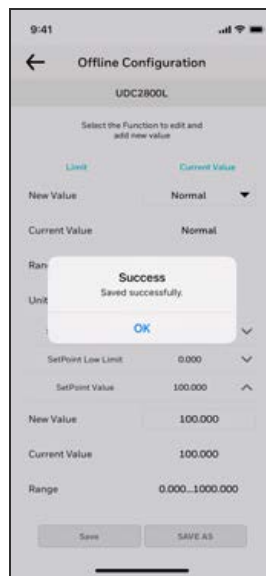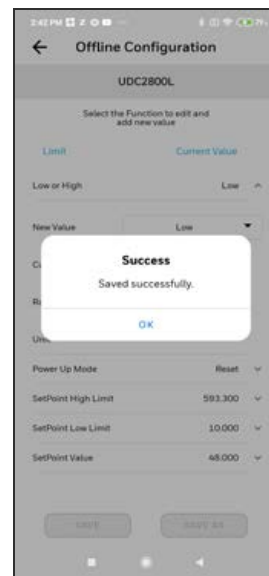
| IOS app | Android app |

- If the user wants to save as a new configuration, click **SAVE AS.** Enter **File Name** and **Description** and then click **OK**
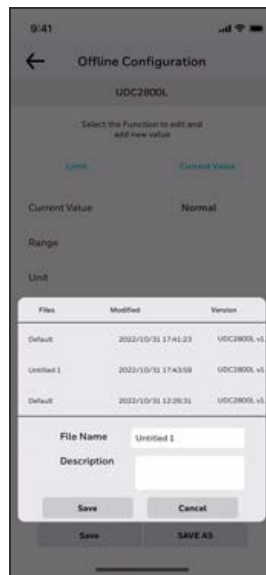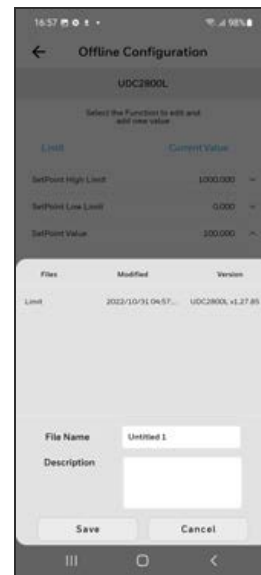
IOS app   Android app

ATTENTION: Users must **Download** the offline configuration to reflect the changes in the UDC device. See Download.

Export configuration

Users can Export the UDC2800 offline configuration files to .cvt format using the Export option. The exported .cvt files can import to other UDC2800 devices.

1. Open the **EasySet** app.

2. Click **Dashboard**, and click **Offline**. The **Offline Configuration** dialog appears.

IOS app   Android app

3. Configure the all parameters and Save the file.

4. Click **Export**. Export options appears.

5. Click **Save to Files** and select the location, and click **Save. Exported successfully** pop-up appears, click **OK**.
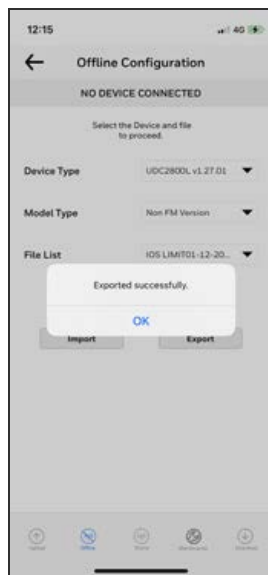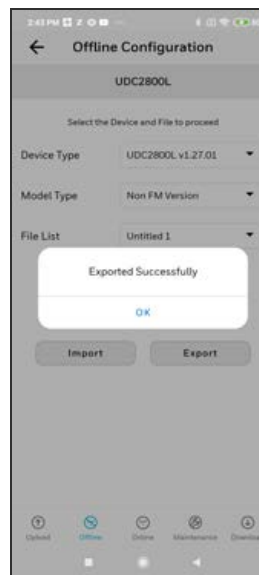
IOS app   Android app

6. Exported .cvt file can be shared through email to import to the other UDC2800 devices.

Import configuration

Using the Import option, users can import the UDC2800 configuration files (.cvt) to the UDC device through the app.

1. Open the mail that contains configuration (.cvt) file. Download the file and save to the IOS mobile.

2. Open the **EasySet** app.

3. Click **Dashboard**, and click **Offline**. The **Offline Configuration** dialog appears.

IOS app	Android app

4. Click **Import**. The import window appears and select the configuration file from the storage. **Imported successfully** pop-up appears, click **OK**.
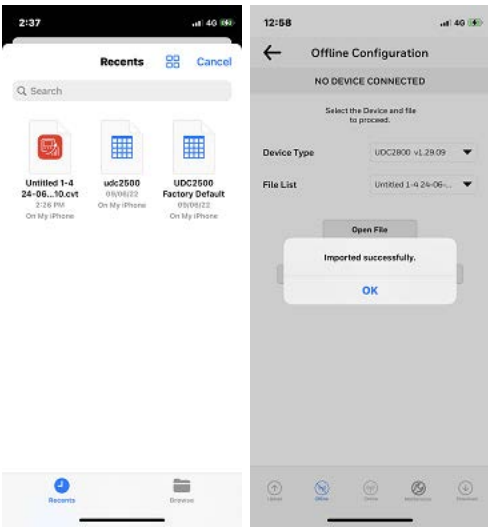
5. Click the arrow at the top left corner to return to the **Dashboard** page.

6. Click **Download**.See Download.

Download

Using the Download option, users can download saved and offline configurations from the EasySet app to the instrument.

1. Click **Dashboard**. The dashboard page appears.

2. Click **Download**. The **Download Configuration** page appears.

| IOS app | Android app |

3. Select **Device Type** and **File List**.

Item	Description
Device Type	Select the device type whose configuration you want to download, e.g. UDC2800.
File List	Previously saved configuration files are shown.

4. Click **Download**, and a dialog appears indicating that the configuration is downloaded successfully.

5. Click **OK**.

> **NOTE:** If user want to delete the selected configuration file, click **Delete**. A confirmation dialog appears, and then click **OK**.

> **ATTENTION:** Before downloading any configuration, the user must ensure that the selected configuration's MSG matches to the device's MSG.

Online Configuration

Online Configuration lets users upload an instrument configuration and modify one change at a time back to the instrument. This option is useful for tuning instruments and is faster than downloading the entire configuration. However, it is recommended to do the offline configuration for multiple changes.

1. Click **Dashboard**. The dashboard page appears.

2. Click **Online Configuration**. The **Online Configuration** dialog appears.

IOS app	Android app

3. Click **Start** to begin upload. Status of upload (% complete) is shown.
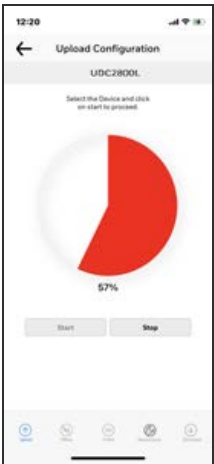
IOS app	Android app

> **NOTE:** To terminate upload, click **Stop**.

If upload is successful, configurable groups appear.

IOS app   Android app

4. Select a group and edit configurations.

> **NOTE:** The groups are organized exactly as on the
> instrument itself.

IOS app   Android app

If an analog configuration is highlighted with red text or a digital configuration is shown blank, it means that the value read up from the instrument is now out of range, either because of previous changes to the instrument's configuration or because of incompatibilities with a downloaded configuration set. Change the configuration to an in-range setting to correct the error.

ATTENTION: In Easyset app, the SP Programming value is displayed as **Px.Sy00**, for which the event applies. Px.Sy00 = Program x. Segment y 00. For example, Program2. Segment300 (2.300).

5. Once the configuration is completed, click **Save**. The **Success** dialog appears. Click **OK**.
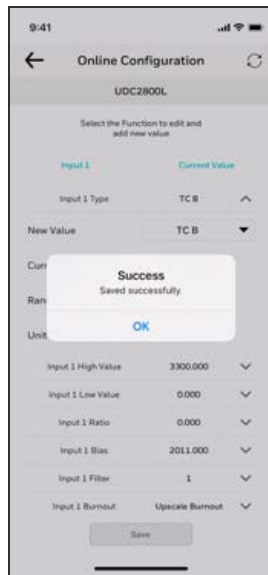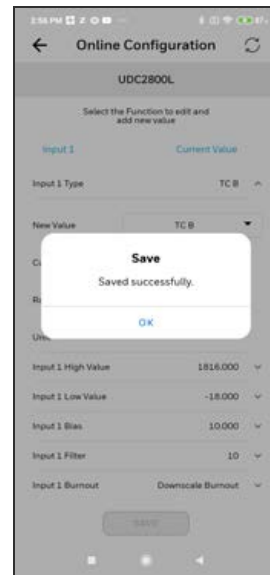
IOS app   Android app

6. Click the arrow icon at the top left corner to return to the configurable groups page.

7. Click the arrow icon at the top left corner again, a dialog appears to ask you to save the changed configuration for later use in the mobile device.

8. Enter **File Name** and **Description** and click **Save**.

IOS app   Android app

> **NOTE:** If user do not want to save the configuration, click **Cancel**.

> **NOTE:** Click the **Refresh** icon to reflect the UDC device's configured settings in the Honeywell EasySet app.

Maintenance Data

Maintenance Data displays key operating parameters and status parameters of the instrument without switching between the instrument screens. Primarily it is used for diagnostics. Some of the information presented here is not visible through the instrument display panel.

1. Click **Dashboard**. The dashboard page appears.
2. Click **Maintenance**. The **Maintenance Data** page appears with **Loop Data**, **Communication Status**, and **Status Data**.
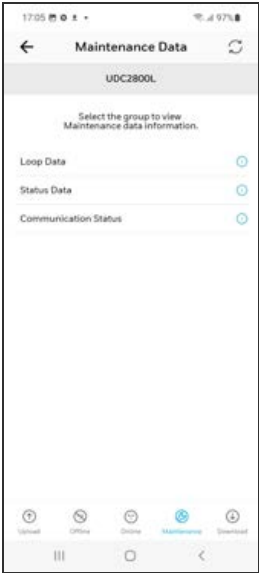
IOS app   Android app

3. Click **Loop Data**. Loop data page appears.

4. Select the loop from the drop-down list, the loop data appears.

IOS app   Android app

> **NOTE:** To refresh the loop data, click the **Refresh** icon.

- Click **Digital Inputs**. The **Digital Inputs Details** page appears.
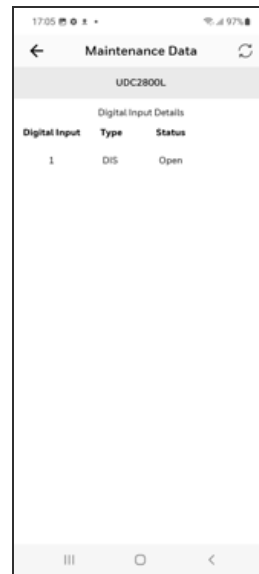
IOS app   Android app

> **NOTE:** To refresh Digital Input Details, click the **Refresh** icon.

Click the arrow icon at the top left corner to return to the loop data page.

- Click **Alarms**. The **Alarms Details** page appears.
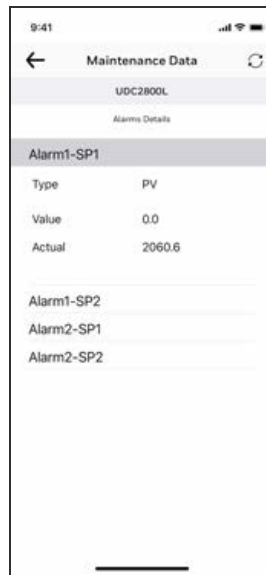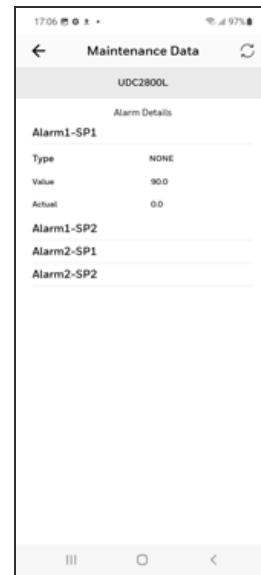
IOS app   Android app

NOTE: To refresh Alarms Details, click the **Refresh** icon.

Click the arrow icon at the top left corner to return to the loop data page.

5. Click the arrow icon at the top left corner to return to the maintenance page.

6. Click **Communication Status**. The Communication status page appears.
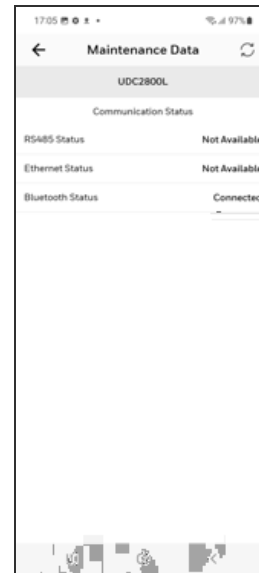
IOS app	Android app

> **NOTE:** The latest EasySet App supports only bluetooth communication.

7. Click the arrow icon at the top left corner to return to the maintenance page and click **Status**. Status data page appears.
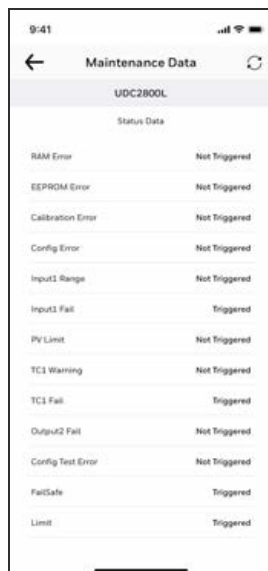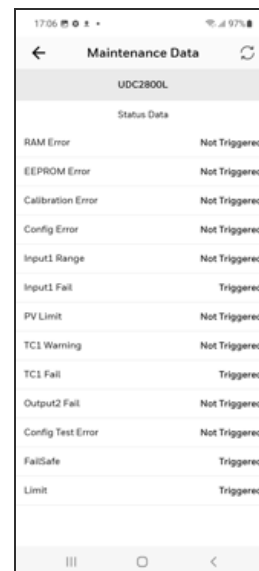
IOS app	Android app

About EasySet

The About EasySet page includes information about the app's release version.

Click **Menu**, and then click **About Easyset**.

IOS app
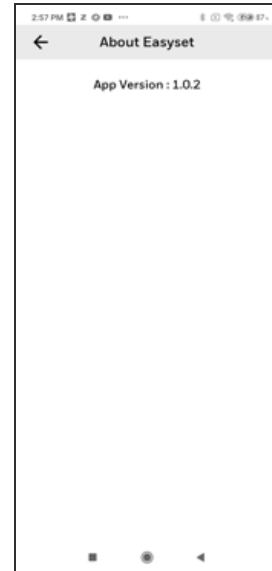
Android app

Firmware update through Easyset app

Users can update the UDC2800 Limit Controller device firmware using Honeywell EasySet IOS or Android app.

NOTE: This Easyset IOS app can be installed on IOS 12.0 or higher operating system.

NOTE: This Easyset Android app can be installed on Android 9 or higher operating system.

NOTE: The R110.3 UDC limit controller device has the latest firmware. So, no need to update again.

ATTENTION: After a firmware update, the UDC device is reset to default factory settings and the user loses all configurations.

Prerequisites

- Connect to the UDC2800 limit controller device. See Communications Setup for more information.
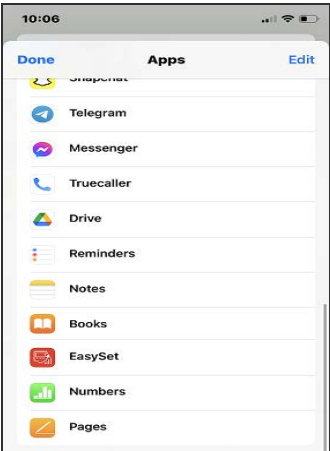
Download the firmware package

1. Go to Honeywell Process Solutions website (https://process.honeywell.com).
2. Click **Sign In** at the top-right corner of the page.
3. If you are a new user, create a new account at this website. Click **Create an Account** and follow the on-screen instructions.
4. If you are an existing user, Click **SIGN IN TO MYHPS** and type your **user name** and **password**, and then click **SIGN IN**.

   After successful sign in, your account name appears at the top-right of the page.

5. Click **Support>Product Documents & Downloads**. The **Product Documents & Downloads** page appears.
6. In the **Search** box, enter **UDC2800 Firmware**, and then click **Search**.
7. Click the document link from the search results to download it.
8. Open the document and download the firmware file to the IOS mobile.

Import the firmware package

On EasySet IOS app	On EasySet Android app
1. Open the firmware file on the IOS mobile.	1. Click the firmware file, and select open with EasySet app.

On EasySet IOS app	On EasySet Android app
2. Click the share icon. Share options appear. 3. Click **More** and select **EasySet** app. 4. Firmware file is imported to the **EasySet** app.	2. Firmware file is imported to the **EasySet** app.

Update firmware package

1. Open the **EasySet** app.
2. Click **Menu**, the menu options page appears.
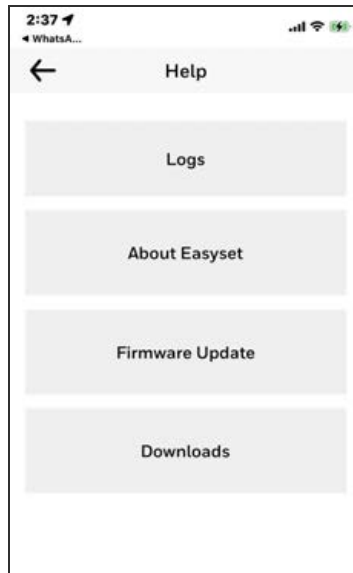
IOS app   Android app

3. Click **Firmware Update** and then click **START**.

IOS app   Android app

4. Firmware update process is started.

IOS app   Android app
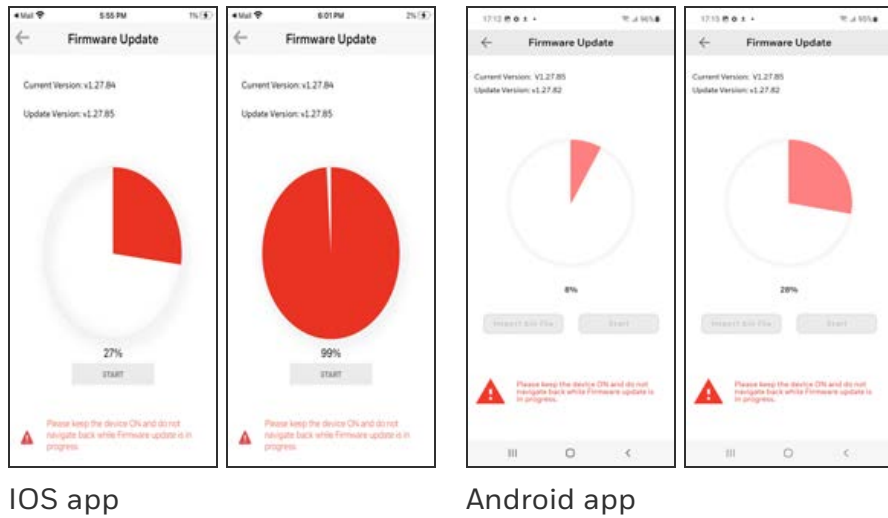
> **ATTENTION:** Do not close the EasySet app during firmware update.

> **ATTENTION:** Do not turn off the UDC device during firmware update.

> **ATTENTION:** Keep the mobile and the UDC device in the Bluetooth range while updating the firmware.

5. When the firmware update is complete, a message appears that the UDC device is going to reboot. Click **OK** and wait for the device to restart.

| IOS app | Android app |

> **ATTENTION:** The device takes some time to reboot. Do not turn off or stop the device.

Once the device restarts, the new firmware is installed in the device.

> **NOTE:** The default password for the UDC device is 1234. It is recommended to change the password after the first login.

Transfer configuration from the legacy device to the UDC2800

Export configuration from legacy device using PIE tool

1. Open the PIE tool in the PC (Desktop or Laptop) or pocket PC.

2. Configure communication setup with PIE tool and UDC device.

3. Click **Services>Export Configuration**. A dialog box appears with configuration file information.
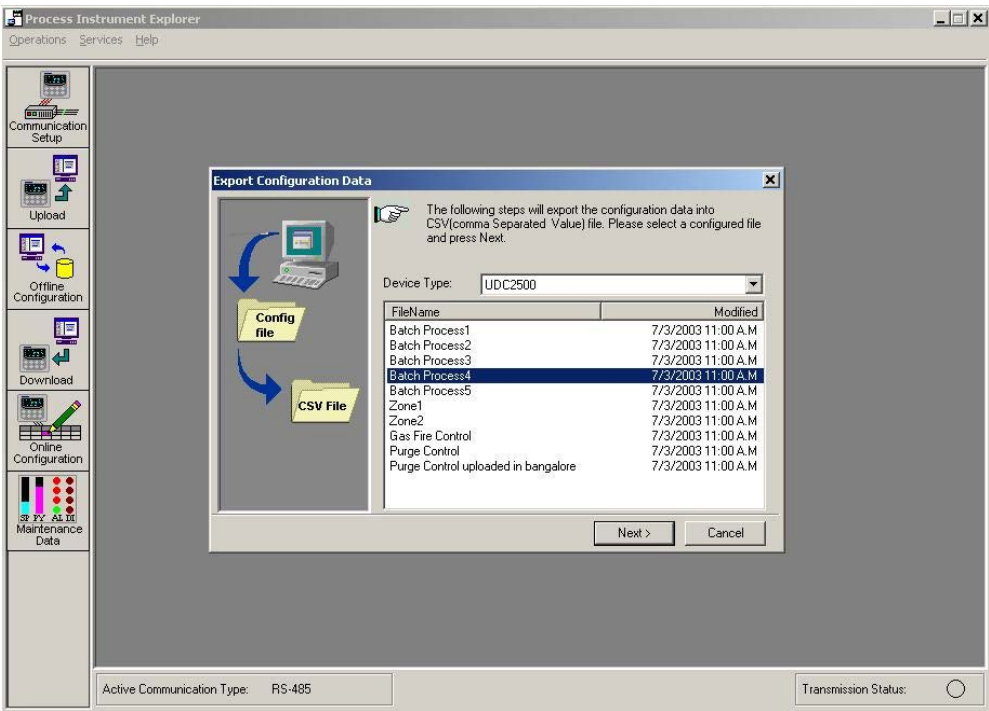
4. Select configuration file and click **Next**. A Dialog appears with the selected file for export.
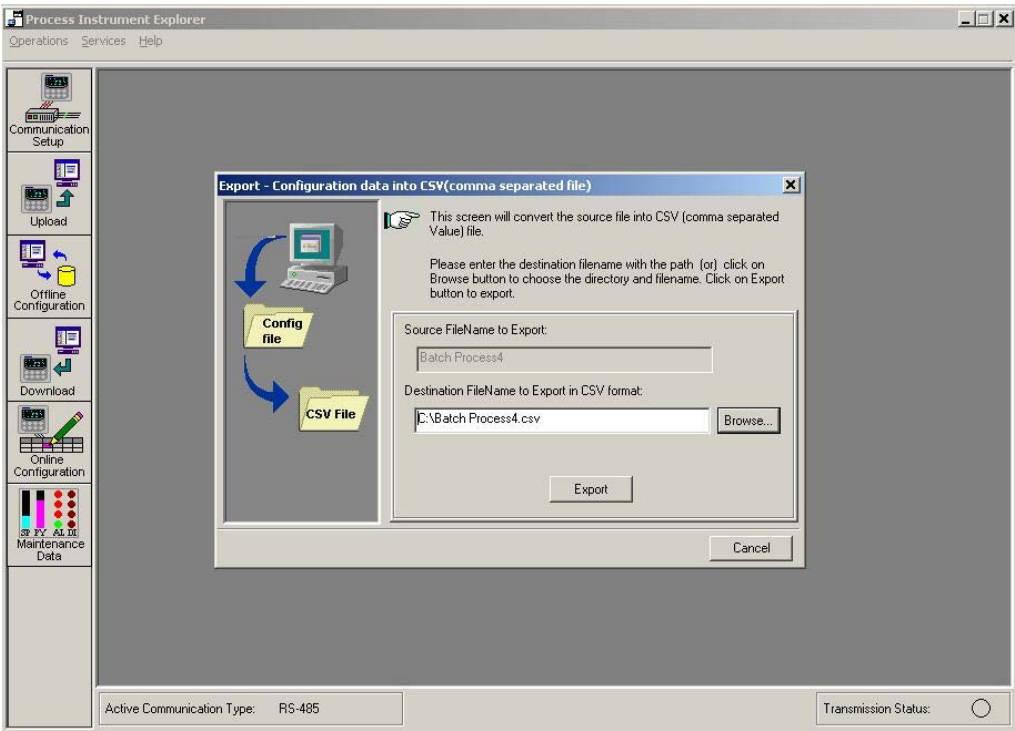
5. Click **Browse** and select the export file destination path. Click **OK**

6. Click **Export**. A confirmation dialog box appears.

The configuration file is exported in .csv format. Send .csv file through mail to import configuration in UDC 2800 limit controller device.

Import configuration to the UDC 2800 using Easy Set app

Set up communications before uploading or downloading instrument configurations. See Communications Setup for more information.

1. Open the mail that contains legacy instrument configuration (.csv) file.

2. Open the .csv file.
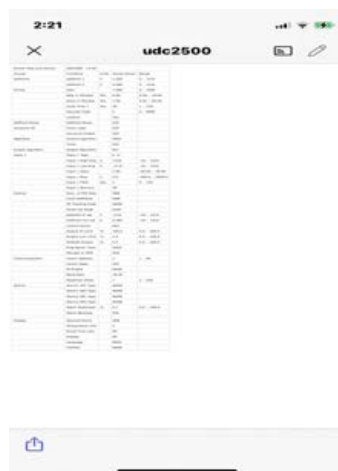
3. Click the share icon. Share options are appear.

4. Click **More** and select **EasySet** app.
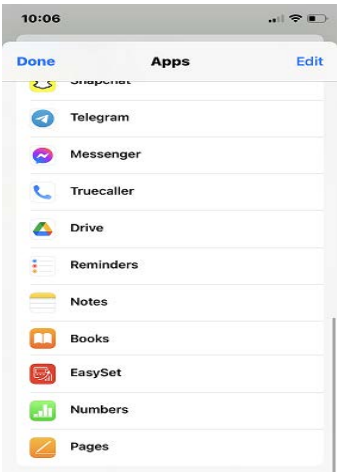
5. Configuration file is uploaded to the app.

6. Open the **EasySet** app.

7. Click **Menu** >**Downloads**. The Download Files page appears
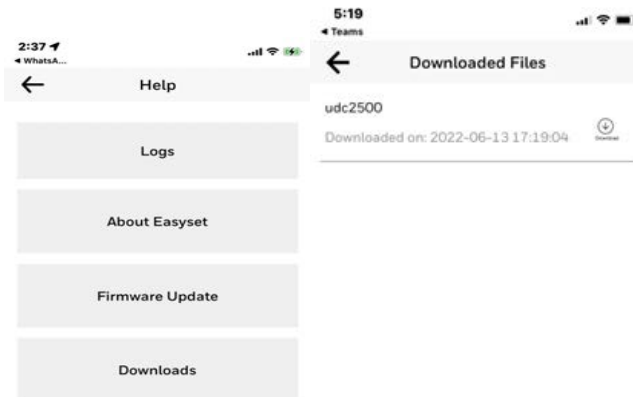
> **NOTE:** The **Template file NOT FOUND** pop-up appears on the download page if the configuration file is not uploaded to the app even once.
>
>
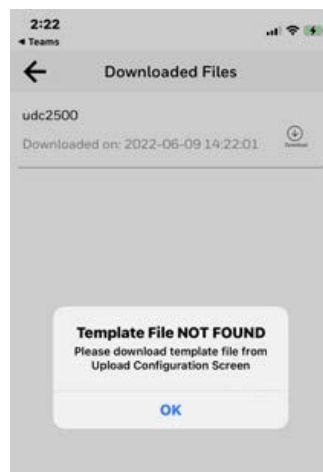
ATTENTION: The UDC device must Factory reset from the controller side before downloading any configuration (.csv) file.
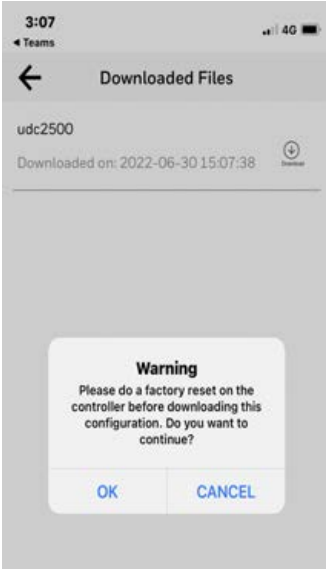
8. Click the **Download** icon to download configuration.

9. The **Success** dialog appears. Click **OK**.
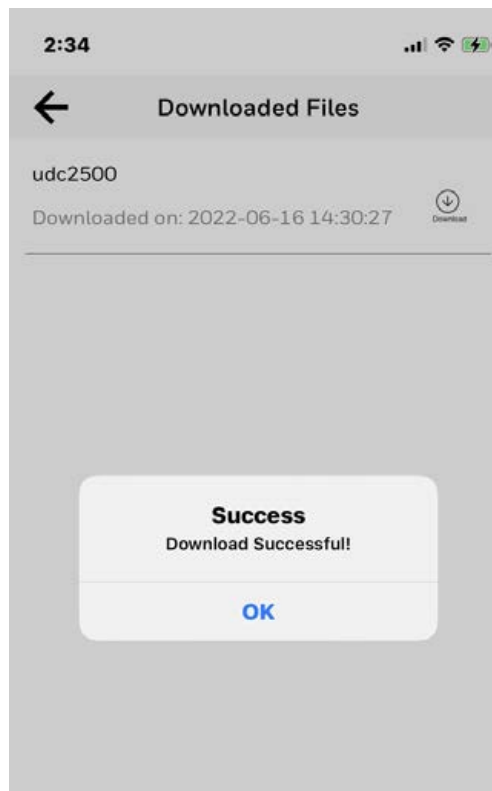
> **ATTENTION:** As the menu layout for the UDC 2800 changes, the old device SPP and Security settings do not migrate. The user must configure the settings manually for the first time.

Legacy UDC device configuration is successfully imported to the UDC 2800 limit controller.

11

MODBUS RTU FUNCTION CODES

What's in this section?

The following topics are covered in this section.

In this section:

Overview

This section describes the function codes needed to upload and download the configuration from a host computer into this instrument.

> **NOTE:** The UDC 2800 Limit Controller Modbus address are different with legacy UDC limit controller modules.

Table 11-1: Modbus Function Codes 20&21 Definitions

Function Code	Name	Usage
20 (14h)	Read General Reference	Used to Read or upload the instrument's configuration into the host device. See Function Code 20 (14h) – Read Configuration Reference Data for more information.
21 (15h)	Write General Reference	Used to Write or download an instrument's configuration into the instrument from a host device. See Function Code 21 (15h) – Write Configuration Reference Data for more information.

General Information

This instrument uses a subset of the standard Modbus RTU function codes to provide access to process-related information. Several MODICON function codes are implemented. It is appropriate to define instrument-specific "user-defined" function codes. Where differences occur between the two protocols it will be noted. Several standard Modbus RTU function codes are supported.

Configuration ID Tags

Function codes 20 and 21 use the RS485 tag IDs for accessing configuration and process-related data. These tags are fully explained in Section Modbus Read, Write and Override Parameters plus Exception Codes.

The tag IDs represent the register addresses used in the Request Message.

Other Modbus Codes

For Modbus codes other than for accessing configuration and process-related data for this controller, see the Modbus RTU Serial Communications User Manual # 51-55-25-66.

Table 11-2: Integer Parameter Type

Register Numbers (Dec)	Name	Access	Notes
1	Type = 1	NOT SUPPORTED	16-bit Unsigned Integer
2	Attribute	NOT SUPPORTED	1 = Read Only, 2 = Read/Write
3	Value (16 bit integer)	Read / Write	
4	Not Used	NOT SUPPORTED	
5	Low Range (16 bit integer)	NOT SUPPORTED	
6	Not Used	NOT SUPPORTED	
7	High Range (16 bit Integer)	NOT SUPPORTED	
8	Not Used	NOT SUPPORTED	
9 to 13	Description Text (ASCII string)	NOT SUPPORTED	

Table 11-3: Floating Point Parameter Type

Register Numbers (Dec)	Name	Access	Notes
1	Type = 2	NOT SUPPORTED	IEEE Floating Point
2	Attribute	NOT	1 = Read Only,

Register Numbers (Dec)	Name	Access	Notes
		SUPPORTED	2 = Read/Write
3	Value (float high word)	Read / Write	
4	Value (float low word)	NOT SUPPORTED	
5	Low Range (float high word)	NOT SUPPORTED	
6	Low Range (float low word)	NOT SUPPORTED	
7	High Range (float high word)	NOT SUPPORTED	
8	High Range (float low word)	NOT SUPPORTED	
9 to 13	Description Text (ASCII string)	NOT SUPPORTED	

Register Count

The register count depends on the data format of the registers being read or written.

Integer data is represented in sixteen bits and is transferred high byte first.
Floating point data is transferred in IEEE 32–bit format.

The register count definitions are:

    0001 = Integer Data
    0002 = Floating Point Data

Function Code 20 (14h) – Read Configuration Reference Data

Description

Function code 20 (14 Hex) is used in this instrument to read information stored in its configuration database. EachUDC2300 configuration item is explicitly addressed by a file number and register address. IEEE 32–bit floating point and 16–bit integer formats are supported.

Request and Response Formats

The Request and Response formats for Function code 20 (14 Hex) are shown below. Details for each block reference follow.

Request Message Format

Slave Address	Function Code 14	Byte Count	Reference Type	File Number	Register Address	Register Count	· · · ·

· · · ·	Reference Type	File Number	Register Address	Register Count	· · · ·	CRC Data	CRC Data

Response Message Format

Slave Address	Function Code 14	Byte Count	Data Byte Count	Reference Type	Data	Data	Data	· · · ·

· · · ·	Data	Data Byte Count	Reference Type	Data	Data	Data	Data	· · · ·

· · · ·	CRC Data	CRC Data
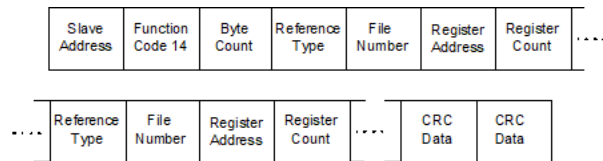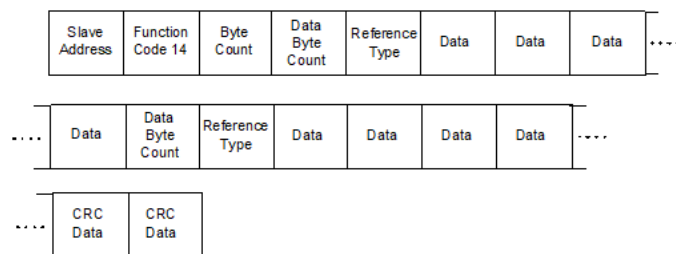
Byte Count

The Byte Count equals the number of bytes transmitted in either the request or response message and will be the minimum number required to transmit all requested data.

Data byte count heading

The Data Byte Count is the number of data bytes of the sub response including the Reference Type but not including itself. A floating point sub response has four bytes of data and one byte representing the reference type making the data byte count equal to five.

Reference Type Definitions

The Reference Type definition is always 06.
See examples in Subsection Read Configuration Examples

File Number

The file number word contains the register number from the register address structure tables on page 3. Although the register address structure tables indicate up to 13 data registers are available for access, only register address 3 is currently supported.

Register Address

The register address word represents the tag ID number for the parameter(s) being accessed. The register address word is made up of two bytes—the MSB = 00 always. The LSB contains the tag ID number. The tag ID numbers represent the parameter's register address(es). See Configuration for more information.

Table 11-4: Register Address Format for Function Code 20

Register Address(es) (Decimal)	Register Address(es) (Hex)	Format
1 to 2048	1 to 800	analog formatted data (2 registers – IEEE 32-bit floating point)
2049 to 4096	801 to 1000	integer formatted data (1 register – 16-bit integer)

Read Configuration Examples

Example #1

The following is an example of a request to read the Gain 1 value using Function code 20.

Request Message (Read Input 1 HIGH value = ID Tag 001)

02 14 07 06 00 03 00 CE 00 02 (CRC16)

Where:
02 = Address
14 = Function Code 20 (14 hex)
07 = Byte Count
06 = Reference Type
00,03 = File Number (Access Data Value)
00,CE = Register Address (Standard Input 1 HIGH value– Tag ID #1)
00 02 = Register Count (Floating Point Data)
(CRC16)

This is the response to the above request.

Response Message

　02 14 06 05 06 3F C0 00 00 (CRC16)

Where:
02 = Address
14 = Function Code 20 (14 Hex)
06 = Byte Count
05 = Sub Message Length
06 = Reference Type (IEEE Floating Point)
3F C0 00 00 = 1.50 (Value of Proportional Band)
(CRC16)

Example #2

The following is another example of a request and response message using Function code 20.

Request Message (Read LSP #1 = ID Tag 39 and LSP #2 = ID Tag 53)

02 14 0E 06 00 03 00 27 00 02 06 00 03 00 35 00 02 (CRC16)

Where:
02 = Address
14 = Function Code 20 (14 Hex)
0E = Byte Count
06 = Reference Type (IEEE Floating Point)
00,03 = File Number (Access Data Value)
00,27 = Register Address (Standard Access LSP #1 - ID Tag 39)
00,02 = Register Count to read (Floating Point Data)
06 = Reference Type (IEEE Floating Point)
00,03 = File Number (Access Data Value)
00,35 = Register Address (Standard Access LSP #2 - ID Tag 53)
00,02 = Register Count to read (Floating Point Data)
(CRC16)

This is the response to the above request.

Response Message

02 14 0C 05 06 43 C8 00 00 05 06 44 60 00 00 (CRC16)

Where:
02 = Address
14 = Function Code 20 (14 Hex)
0C = Byte Count
05 = Data Byte Count (Sub Message Length)
06 = Reference Type (IEEE Floating Point)
43 C8 00 00 = 400.0 (Value of Local Setpoint #1)
05 = Data Byte Count (Sub Message Length)
06 = Reference Type (IEEE Floating Point)
44 60 00 00 = 896.0 (Value of Local Setpoint #2)
(CRC16)

Function Code 21 (15h) – Write Configuration Reference Data

Introduction

Function Code 21 (15 Hex) is used in this instrument to allow writes of integer and floating point values to the configuration database and override values.

The configuration database of this instrument is located in EEROM. The override values are stored in RAM.

Integer format is used to write to "Digital" configuration items.
Floating Point format is used to write to "Analog" configuration items
as defined by the configuration ID tags.

Write Restrictions

Care should be taken not to exceed the 100,000 write limit of the
EEROM.

Request and Response Formats

The Request and Response formats for Function code 21 (15 Hex)
are shown below. Details for each block reference follow.

Request Message Format

Slave Address	Function Code 15	Byte Count	Reference Type	File Number	Register Address	Register Count	....

....	Data	Data	Data	Data	File Number	...	CRC Data	CRC Data
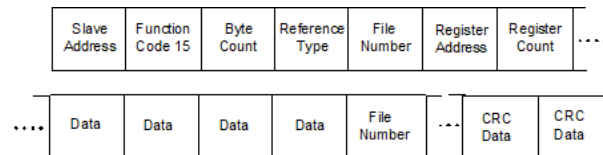
Response Message Format (echo back of request)

Slave Address	Function Code 15	Byte Count	Reference Type	File Number	Register Address	Register Count	....

....	Data	Data	Data	Data	File Number	...	CRC Data	CRC Data
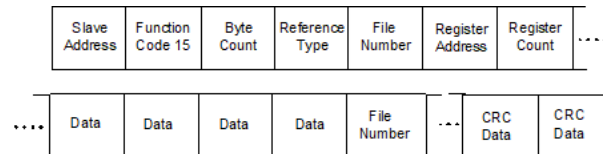
The register address is interpreted as the tag ID configuration
number.

Reference Type Definitions

The Reference Type definition is always 06.
See examples in Subsection Write Configuration Examples

File Number

The file number word contains the register number from the register address structure shown in Integer Parameter Type and Floating Point Parameter Type. Although the register address structure tables indicate up to 13 data registers are available for access, only register address 3 is currently supported.

Register Address

The register address is used to designate the tag ID number for the parameter being accessed. The register address is made up of two bytes—the MSB = 00 always. The LSB contains the tag ID number. The tag ID numbers represent the parameter's register address(es). See Section Modbus Read, Write and Override Parameters plus Exception Codes for the tag ID numbers.

Table 11-5: Register Address Format for Function Code 21

Register Address(es) (Dec)	Register Address(es) (Hex)	Format
1 to 2048	1 to 800	analog formatted data (2 registers – IEEE 32-bit floating point)
2049 to 4096	801 to 1000	integer formatted data (1 register – 16-bit integer)

Unrestricted Registers

As mentioned previously, all register data is stored in the EEROM of this instrument with some exceptions. These exceptions were made to allow write access to override information. The registers, which are designated as Override values, are listed below. These registers do not have restrictions on the number of writes.

ID Tag	Register Number	UDC Usage
263	107 (Hex)	Computer Setpoint

Restrictions on Parameter Numbers in One Message

The maximum number of writeable parameters per write request is 1.

Write Configuration Examples

Example #1

The following is an example of a request to write the Gain 1 value using Function code 21 (15 Hex).

Request Message (Input 1 type 1= 6 "ID Tag 1")

02 15 09 06 00 03 08 99 00 01 00 06 (CRC16)

Where:
02 = Address
15 = Function Code 21 (15 Hex)
09 = Byte Count
06 = Reference Type (IEEE Floating Point)
00 03 = File Number (Access Data Value)
08 09 = Register Address (Standard Access - Input 1 type 1– ID Tag 1)
00 01 = Register Count (Integer)
00 06 = 6
(CRC16)

This is the response to the above request.

Response Message (The response is an echo of the request)

02 15 09 06 08 99 00 01 00 06 (CRC16)

Modbus Read, Write and Override Parameters plus Exception Codes

What's in this section?

The following topics are covered in this section.

In this section:

Overview

Introduction

This section contains information concerning Reading, Writing, and Overriding parameters in this instrument. There are two types of parameters:

- Data Transfer—These parameters include reading control data, option status, and reading or changing setpoints.

- Configuration Data—All the configuration data is listed in the order in which it appears in the controller.

Each type of parameter has the identifying codes listed with it.

General Information

Non-volatile Memory Retention

- This controller uses non-volatile memory to store configuration data. These memories are guaranteed to retain data for a minimum of ten years as long as the data is not written and erased more than 10,000 times. In order not to exceed this number, it is strongly recommended that configurations which change rapidly such as Computer Setpoint use the Override feature which does not affect non-volatile memory.

Analog Parameters

- Whenever analog register addresses (those that can be changed via communications) are changed, a Write cycle occurs after receipt of the message and the response is returned.

Override Parameters

- Override analog register address 107 (computer setpoint) is not stored in non-volatile memory. It can be changed as frequently as desired with no effect on non-volatile memory retentivity, but the controller must remain in the slave mode.

Digital Parameters

- Whenever digital configuration register addresses are updated via communications, the non-volatile memory is updated as soon as the message is received.

Communications Transfer Rates

- Reads minimum 20mS and writes minimum 200mS

Supported Function Codes

- Bluetooth port 20 and 21
- RS485 and Ethernet ports 1,2,3,4,6,16,17,20,21

Communications Modes of Operation

- When the Shed Timer is enabled and a write or override occurs the controller will enter Slave Mode. The keypad is locked from the operator. The purpose of this mode is that if communications is lost and the shed timer times out then the controller will enter a known state of operation. The configuration of the "Shed Mode and Output" and Shed Setpoint Recall are used to configure the controller's shed state. While in Slave Mode pushing the MAN/AUTO key enters Emergency Manual mode. The local operator then has control of the output. The controller is in Monitor Mode if the Shed timer is disabled.

Reading Control Data

Overview

The following control data can be read from this instrument:

- Input 1

Register Addresses

Use the identifying codes listed in Control Data Parameters to read the specific items.

A Write request for these codes will result in an Error message.

Table 11-6: Control Data Parameters

Parameter Description	Register Address		Data Type	Access	Data Range or Enumerated Selection
	Hex	Decimal			
Input #1	190	400	FP	RD	In Engineering Units or Percentage
LSP1	129	297	FP	R/W	In Engineering Units Within Set point Limits

Read Software Options Status

Doing a Read of register address 9C4 listed in the following table will tell you which of the available options are enabled / installed or disabled / not installed.

Table 11-7: Option Status

Parameter Description	Register Address		Data Type	Access	Data Range or Enumerated Selection
	Hex	Decimal			
Software Option Status	9C4	2500	INT	RD	See figure below

The data field in the response message will be a decimal number from 0 to 255. Convert the decimal number to binary as shown in the figure below to determine which options are or are not active.

Figure 11-1: Software Option Status Information
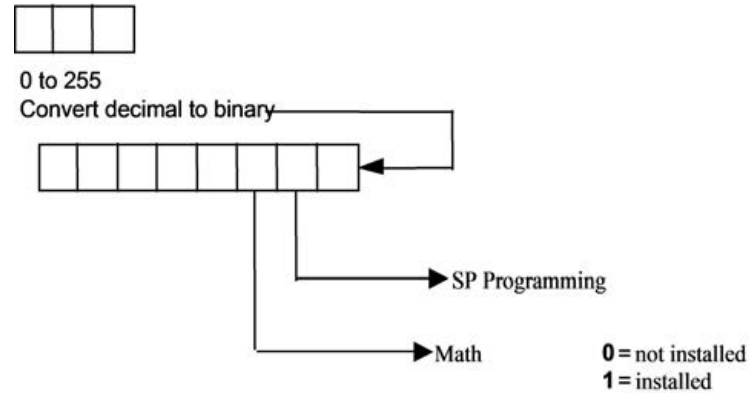
Miscellaneous Read Only

Register Addresses for Read Only

The identifying register addresses listed in Miscellaneous Read Only represent some information that is Read only. No Writes allowed.

Table 11-8: Miscellaneous Read Only

Parameter Description	Register Address		Data Type	Access	Data Range or Enumerated Selection
	Hex	Decimal			
Software Type	9C5	2501	INT	RD	0 ~ 65535
Software Version	9C6	2502	INT	RD	0 ~ 65535

Setpoints

You can use two separate local setpoints in the controller. The identifying register addresses listed in the following table allow you to select which setpoint you want to use and to enter a value in Engineering Units (whichever is selected at register address 8D7 (Hex)) for that setpoint via communications.

Associated Parameters

Refer to table below to display or change any of the parameters associated with the setpoint.

Table 11-9: Setpoint Associated Parameters

Parameter	Register Address	
	Hex	Decimal
Setpoint Limits	E5, E6	229, 230
Computer Setpoint	107	263

Using a Computer Setpoint (Overriding Controller Setpoint)

You can use a setpoint generated from the computer to override the setpoint being used by the controller. The value generated by the computer will have ratio and bias applied by the controller.

Register Address

Use the identifying code in table below to enter the computer setpoint.

Table 11-10: Computer Setpoint Selection

Parameter Description	Register Address		Data Type	Access	Data Range or Enumerated Selection
	Hex	Decimal			
Computer Setpoint	107	263	FP	R/W	Value from computer with Ratio and Bias applied by the controller. Within the Setpoint Range Limits

Parameter Description	Register Address		Data Type	Access	Data Range or Enumerated Selection
	Hex	Decimal			
					in Engineering Units or Percent.

Shed

The computer setpoint override will continue until SHED from communications occurs or the controller is placed into monitor mode through communications. Doing periodic SLAVE READS within the shed time will allow the override to continue until communication is stopped and shed time elapses. Does not apply to Bluetooth communications.

> **ATTENTION:** 0 Shed (code 8D4 (Hex)) allows the override to continue indefinitely or until the reset shed timer register address 1B90 is written using function code 6 or register address 199 (Hex) using function code 21. Any data value can be written because it is ignored.

When SP is overridden, the middle display shows the CSP value as CSP XXXX.

Table 11-11: Shed Timer Reset

Parameter Description	Register Address		Data Type	Access	Data Range or Enumerated Selection
	Hex	Decimal			
Shed Time Reset	199	409	FP	W	Exit Slave Mode

Configuration Parameters

Overview

Listed on the next pages are the identifying codes for the parameters in the various Set-up Groups in the UDC2800 Limit Controller. Most of the parameters are configurable through the hosts. Some are Read Only and are indicated as such and cannot be changed.

Reading or Writing

Do a Read or Write, depending on your requirements, using the identifying code and format code listed in the tables. The range or selection available for each range is listed in the tables

Security

Table below lists all the register addresses and ranges or selections for the function parameters in the Set-up Group Security.

Table 11-12: Set-up Group – Security

Parameter Description	Register Address		Data Type	Access	Data Range or Enumerated Selection
	Hex	Decimal			
FM Version (Read only)	806	2054	INT	R	0 = Disable 1 = Enable
Lockout (keyboard only) Changes to data are always possible via communications regardless of this configuration.	801	2049	INT	R/W	0 = No Lockout 1 = Calibration Locked out 2 = +Configuration – Timer, Tuning, SP Ramp, Accutune are read/write 3 = +SP – Only the Lockout group is available for read/write. Setpoint value is Read Only

Parameter Description	Register Address		Data Type	Access	Data Range or Enumerated Selection
	Hex	Decimal			
Restore Settings	805	2053	INT	R/W	0 = Disable 1 = Enable

Limit

The identifying register addresses listed in Set-up Group Limit lists all the register addresses and ranges or selections for the function parameters in Set-up Group Limit.

Table 11-13: Set-up Group Limit

Parameter Description	Register Address		Data Type	Access	Data Range or Enumerated Selection
	Hex	Decimal			
High/Low Limit	902	2306	INT	R/W	0 = Low Limit 1 = High Limit
Power Up Selections	903	2307	INT	R/W	0 = Normal 1 = Reset
Set Point High Limit	127	295	FP	R/W	0 to 100% of PV (Engineering Units)
Set Point Low Limit	128	296	FP	R/W	0 to 100% of PV (Engineering Units)

Input 1

Table below lists all the register addresses and ranges or selections for the function parameters in Set-up Group Input 1.

Table 11-14: Set-up Group – Input 1

Parameter Description	Register Address		Data Type	Access	Data Range or Enumerated Selection
	Hex	Decimal			
Input 1 Type	899	2201	INT	R/W	0 = Disable
					1 = TC B
					2 = TC E High
					3 = TC E Low
					4 = TC J High
					5 = TC J Mid
					6 = TC J Low
					7 = TC K High
					8 = TC K Mid
					9 = TC K Low
					10 = TC M High
					11 = TC M Low
					12 = TC N High
					13 = TC N Low
					14 = TC R
					15 = TC S
					16 = TC T High
					17 = TC T Low
					18 = TC C High
					19 = TC C Low
					20 = TC PR40-PR20
					21 = Thermocouple Differential
					22 = RTD Pt100

Parameter Description	Register Address		Data Type	Access	Data Range or Enumerated Selection
	Hex	Decimal			
					23 = RTD Pt100 Low
					24 = RTD Pt200
					25 = RTD Pt500
					26 = 0-20 mA
					27 = 4-20 mA
					28 = 0-10 mV
					29 = 0-50 mV
					30 = 0-100 mV
					31 = 1-5 Vdc
					32 = 0-5 Vdc
					33 = 0-10 Vdc
	ATTENTION: Changing the Input Type will result in the loss of Field Calibration values and will restore the Factory Calibration values.				
Input 1 Transmitter Characterization	89A	2202	INT	R/W	0 = TC B
					1 = TC E High
					2 = TC E Low
					3 = TC J High
					4 = TC J Mid
					5 = TC J Low
					6 = TC K High
					7 = TC K Mid
					8 = TC K Low
					9 = TC M High

Parameter Description	Register Address		Data Type	Access	Data Range or Enumerated Selection
	Hex	Decimal			
					10 = TC M Low
					11 = TC N High
					12 = TC N Low
					13 = TC R
					14 = TC S
					15 = TC T High
					16 = TC T Low
					17 = TC C High
					18 = TC C Low
					19 = TC PR40-PR20
					20 = RTD Pt100
					21 = RTD Pt100 Low
					22 = RTD Pt200
					23 = RTD Pt500
					24 = Linear
					25 = Square Root
Input 1 High Value	CE	206	FP	R/W	–999. to 9999. Engineering Units (Linear types only)
Input 1 Low Value	CF	207	FP	R/W	–999 to 9999. Engineering Units (Linear types only)
Input 1 Bias	D1	209	FP	R/W	–999 to 9999 (For non-FM model) & -10 to 10 (For FM model). Engineering Units

Parameter Description	Register Address		Data Type	Access	Data Range or Enumerated Selection
	Hex	Decimal			
Input 1 Filter	D2	210	FP	R/W	0 to 120 seconds
Input 1 Burnout (Open Circuit Detection) (Read only)	89B	2203	INT	R	0 = Not used 1 = Upscale Burnout 2 = Downscale Burnout 3 = Not used

Options

Table below lists all the register addresses and ranges or selections for the function parameters in Set-up Group Options.

Table 11-15: Set-up Group – Options

Parameter Description	Register Address		Data Type	Access	Data Range or Enumerated Selection
	Hex	Decimal			
Auxiliary Output *	8B7	2231	INT	R/W	0 = Disable 1 = PV 2 = Deviation
CO Low Value	FB	251	FP	R/W	Within the range of the selected variable in ID 134
CO High Value	FC	252	FP	R/W	Within the range of the selected variable in ID 134
CO Range	8B8	2232	INT	R/W	0 = 4-20 mA 1 = 0-20 mA
Digital Input 1 Function	8B9	2233	INT	R/W	0 = Disable 1 = Enable

Communications

Table below lists all the register addresses and ranges or selections for the function parameters in Set-up Group Communications.

Table 11-16: Set-up Group – Communications

Parameter Description	Register Address		Data Type	Access	Data Range or Enumerated Selection
	Hex	Decimal			
Bluetooth Function	8C1	2241	INT	R/W	0 = Disable 1 = Enable
Communicatio	8C2	2242	INT	R/W	0 = Disable

Parameter Description	Register Address		Data Type	Access	Data Range or Enumerated Selection
	Hex	Decimal			
ns Type					1 = RS-485 Modbus 2 = Ethernet
Modbus Address	8C3	2243	FP	R/W	1 - 99
Baud Rate	8C4	2244	INT	R/W	0 = 4800 1 = 9600 2 = 19200 3 = 38400
Response Delay	8C5	2245	FP	R/W	Response Delay in ms (1 to 500) + 6ms
Word Oder for Float	8C6	2246	INT	R/W	0 = FP B 0123 1 = FP BB 1032 2 = FP L 3210 3 = FP LB 2301
Ethernet Address 1	8C7	2247	INT	R/W	Ethernet Address = Add1.Add2.Add3.Add4
Ethernet Address 2	8C8	2248	INT	R/W	Ranges: 0~255
Ethernet Address 3	8C9	2249	INT	R/W	
Ethernet Address 4	8CA	2250	INT	R/W	
Subnet Mask Address 1	8CB	2251	INT	R/W	Subnet Mask Address = Add1.Add2.Add3.Add4
Subnet Mask Address 2	8CC	2252	INT	R/W	Ranges: 0~255
Subnet Mask Address 3	8CD	2253	INT	R/W	

Parameter Description	Register Address		Data Type	Access	Data Range or Enumerated Selection
	Hex	Decimal			
Subnet Mask Address 4	8CE	2254	INT	R/W	
Default Gateway 1	8CF	2255	INT	R/W	Default Gateway = Gateway1.Gateway2.Gateway3.Gateway4

Ranges: 0~255 |
Default Gateway 2	8D0	2256	INT	R/W	
Default Gateway 3	8D1	2257	INT	R/W	
Default Gateway 4	8D2	2258	INT	R/W	
Shed Function	8D3	2259	INT	R/W	0 = Enable

1 = Disable |
| Shed Time | 12A | 298 | FP | R/W | 0~255

Unit: 1/3 second |
| Shed Setpoint Recall | 8D6 | 2262 | INT | R/W | 0 = To Last Local Setpoint used

1 = To Computer SP |
| Computer Setpoint Units | 8D7 | 2263 | INT | R/W | 0 = Engineering Units

1 = Percent |
| Local Loopback | 8D8 | 2264 | INT | R/W | 0 = Disable

1 = Enable |

Alarms

Table below lists all the register addresses and ranges or selections for the function parameters in Set-up Group Alarms.

Table 11-17: Set-up Group – Alarms

Parameter Description	Register Address		Data Type	Access	Data Range or Enumerated Selection
	Hex	Decimal			
Alarm 1 Setpoint 1 Type	8DF	2271	INT	R/W	0 = None 1 = PV 2 = Deviation 3 = Alarm on Shed 4 = Failsafe 5 = PV Rate of Change 6 = Alarm on Digital Input 1 7 = T/C Warning 8 = T/C Fail
Alarm 1 Setpoint 1 Value	10F	271	FP	R/W	Within the range of selected parameter.
Alarm 1 Setpoint 1 State	8E0	2272	INT	R/W	0 = High Alarm 1 = Low Alarm
Alarm 1 Setpoint 1 Delay	12B	299	FP	R/W	0~30 seconds
Alarm 1 Setpoint 1 Hysteresis	110	272	FP	R/W	0.0 to 100% of output or span
Alarm 1 Setpoint 2 Type	8E3	2275	INT	R	Same as 8DF
Alarm 1 Setpoint 2 Value	111	273	FP	R/W	Within the range of selected parameter.
Alarm 1 Setpoint 2 State	8E4	2276	INT	R/W	0 = High Alarm 1 = Low Alarm
Alarm 1 Setpoint 2 Delay	12C	300	FP	R/W	0~30 seconds

Parameter Description	Register Address		Data Type	Access	Data Range or Enumerated Selection
	Hex	Decimal			
Alarm 1 Setpoint 2 Hysteresis	112	274	FP	R/W	0.0 to 100% of output or span
Alarm 2 Setpoint 1 Type	8E7	2279	INT	R	Same as 8DF
Alarm 2 Setpoint 1 Value	113	275	FP	R/W	Within the range of selected parameter.
Alarm 2 Setpoint 1 State	8E8	2280	INT	R/W	0 = High Alarm 1 = Low Alarm
Alarm 2 Setpoint 1 Delay	12D	301	FP	R/W	0~30 seconds
Alarm 2 Setpoint 1 Hysteresis	114	276	FP	R/W	0.0 to 100% of output or span
Alarm 2 Setpoint 2 Type	8EB	2283	INT	R/W	Same as 8DF
Alarm 2 Setpoint 2 Value	115	277	FP	R/W	Within the range of selected parameter.
Alarm 2 Setpoint 2 State	8EC	2284	INT	R/W	0 = High Alarm 1 = Low Alarm
Alarm 2 Setpoint 2 Event	8ED	2285	INT	R/W	0 = Begin of Segment 1 = End of Segment
Alarm 2 Setpoint 2 Delay	12E	302	FP	R/W	0~30 seconds
Alarm 2 Setpoint 2 Hysteresis	116	278	FP	R/W	0.0 to 100% of output or span
Alarm Latching for Output 1	8EF	2287	INT	R/W	0 = Non Latching 1 = Latching
Alarm Blocking	8F0	2288	INT	R/W	0 = Disable 1 = Alarm 1

Parameter Description	Register Address		Data Type	Access	Data Range or Enumerated Selection
	Hex	Decimal			
					2 = Alarm 2
					3 = Alarm 1&2
AO/CO Diagnostic Alarm	8F1	2289	INT	R/W	0 = Disable
					1 = Alarm 1
					2 = Alarm 2
					3 = Disable Warning

Display

Table below lists all the register addresses and ranges or selections for the function parameters in Set-up Group Display.

Table 11-18: Set-up Group – Display

Parameter Description	Register Address		Data Type	Access	Data Range or Enumerated Selection
	Hex	Decimal			
Decimal Point Location	8FD	2301	INT	R/W	0 = None – Fixed
					1 = One Digit– Floating decimal point to one
					2 = Two Digits– Floating decimal point to two
					3 = Three Digits– Floating decimal point to three
Temperature Units	8FE	2302	INT	R/W	0 = °F
					1 = °C
					2 = None
Language	900	2304	INT	R/W	0 = English
TC Diagnostics	901	2305	INT	R/W	0 = Disable
					1 = Enable

STANDARD MODBUS READ, WRITE AND OVERRIDE PARAMETERS

What's in this section?

The following topics are covered in this section.

Modbus RTU Message Format

For more information, see "Modbus RTU Message Format" of *51-52-25-66 Modbus RTU Serial Communications User Manual*, which is available at Honeywellprocess.com.

Table 12-1: Modbus RTU Message Formats

Coding system	8 bit binary

Number of data bits per character	10 Bits
	
	    start bits - 1
	    data bits - 8
	    parity bits - 0
	    stop bits - 1

Parity	Not used
Bit transfer rate	300, 600, 1200, 2400, 4800, 9600, 19200, 38400 Selectable NOTE: Not all instruments support all Baud Rates.
Duplex	Half duplex Transceiver or TX/RX
Error checking	CRC (cyclic redundancy check)
Polynomial	(CRC-16 10100000000001)
Bit transfer order	LSB first
End of message	Idle line for 3.5 or more characters (>1.82 msec for 19200).

Modbus RTU Function Codes

The Honeywell Universal Modbus RTU protocol uses a subset of the standard Modbus RTU function codes to provide access to process-related information. Several MODICON function codes are employed. It is appropriate to define instrument-specific "user-defined" function codes. Several standard Modbus RTU function codes are supported. These standard function codes provide basic support for IEEE 32-bit floating point numbers and 16-bit integer register representation of instrument's process data.

Repolling of data is not supported by these instruments.

Table 12–2: Modbus RTU Function Codes Definitions

Function Code	Name	Usage
01	Read Coil Status	Read the State of a Digital Output
02	Read Input Status	Read the State of a Digital Input
03	Read Holding Registers	Read Data in 16 bit Register Format (high/low). Used to read integer or floating point process data. Registers are consecutive and are imaged from the instrument to the host.
04	Read Input Registers	
06	Preset Single Register	Write Data in 16-bit Integer Format (high/low) ONLY.
08	Loopback Test	Used for diagnostic testing of the communications port.
16 (10h)	Preset Multiple Registers	Write Data in 16-bit Format (high/low). Used to write integer and floating point override data. Registers are consecutive and are imaged from the host to the instrument. Note: UDC will write floating point data using this Function Code.
17 (11h)	Report Device ID	Read instrument ID and connection information, ROM version, etc.

For more information, see "Modbus RTU Function Codes" of *51–52-25-66 Modbus RTU Serial Communications User Manual*, which is available at Honeywellprocess.com.

Digital Output Register Map

Use the identifying codes listed in the following table to read the specific items.

A Write request for these codes will result in an Error message.

Table 12–3: Digital Output Parameters

Parameter Description	Register Address		Data Type	Access	Description
	Hex	Decimal			
Output 1	0x00	1	Float	R	0: No output 1: Hardware channel Output 1
Output 2	0x01	2	INT16	R	0: No output 1: Hardware channel Output 2
Alarm Relay 2 / Output 2	0x02	3	Coil	R	0: No output 1: Hardware channel Output 3
Alarm Relay 1	0x03	4	Coil	R	0: No output 1: Hardware channel Output 4

Digital Input Register Map

Use the identifying codes listed in the following table to read the specific items.

A Write request for these codes will result in an Error message.

Table 12-4: Digital Input Parameters

Parameter Description	Register Address		Data Type	Access	Description
	Hex	Decimal			
Digital Input 1	0x0000	10001	Coil	R	0: No input 1: Digital Input 1

Loop Value Integer Register Map

Table 12-5: Loop Value Integer Register Map

Parameter Description	Register Address		Access	Description
	Hex	Decimal		
PV	0000	40001	R	Signed 16 bit integer, prescale * 10 (Note 1)
Working Set Point	0002	40003	R/W	Signed 16 bit integer, prescale * 10 (Note 1)
Input #1	0004	40005	R	Signed 16 bit integer, prescale * 10
PV Low Range	000B	40012	R	Signed 16 bit integer, prescale * 10
PV High Range	000C	40013	R	Signed 16 bit integer, prescale * 10
Alarm #1 SP #1	000D	40014	R/W	Signed 16 bit integer, prescale * 10
Alarm #1 SP #2	000E	40015	R/W	Signed 16 bit integer, prescale * 10
Alarm #1 Action	000F	40016	R	Signed 16 bit integer,

Parameter Description	Register Address		Access	Description
	Hex	Decimal		
				prescale *1 Bit 0: 1 = Alarm 1 SP 1 State is High, or Event is End; 0 = State is Low, or Event is Begin Bit 1: 1 = Alarm 1 SP 2 State is High, or Event is End; 0 = State is Low, or Event is Begin
Alarm #2 SP #1	0017	40024	R/W	Signed 16 bit integer, prescale * 10
Alarm #2 SP #2	0018	40025	R/W	Signed 16 bit integer, prescale * 10
Alarm #2 Action	0019	40026	R	Signed 16 bit integer, prescale *1 Bit 0: 1 = Alarm 2 SP 1 State is High, or Event is End; 0 = State is Low, or Event is Begin Bit 1: 1 = Alarm 2 SP 2 State is High, or Event is End; 0 = State is Low, or Event is Begin
SP Low Limit	001A	40027	R/W	Signed 16 bit integer, prescale * 10 (Note 1)
SP High Limit	001B	40028	R/W	Signed 16 bit integer, prescale * 10 (Note 1)
Working Set Point	001C	40029	R/W	Signed 16 bit integer, prescale * 10 (Note 1)
PV Override Value	0020	40033	R/W	Signed 16 bit integer, prescale * 10
SP Override Value	0021	40034	R/W	Signed 16 bit integer, prescale * 10 (Note 1)

Parameter Description	Register Address		Access	Description
	Hex	Decimal		
Deviation	0025	40038	R	Signed 16 bit integer, prescale * 10
Decimal Point	0028	40041	R/W	Signed 16 bit integer, prescale *1
Shed Enable	0039	40058	R/W	Bit Packed Bit 0: 0: Disable 1: Enable
Loop Status	003E	40063	R	Bit Packed Bit 0: Unused Bit 1: Unused Bit 2: Unused Bit 3: Unused Bit 4: Unused Bit 5: Unused Bit 6: CSP Bit 7: Unused Bit 8: Unused Bit 9: Unused Bit 10: Unused Bit 11: Unused Bit 12: 1 = Any Digital Input Active Bit 13: 1 = Any Alarm Active Bit 14: Unused Bit 15: Unused
Limit relay status	3641	53890	R	0 = Not Latched

Parameter Description	Register Address		Access	Description
	Hex	Decimal		
				1 = Latched if in Limit condition
Device Status	003F	40064	R/W	1) Bit 0: Emergency Manual
				Bit 1: Failsafe
				Bit 2: Working Calibration Checksum Error
				Bit 3: Configuration Checksum Error
				Bit 4: Factory Calibration Error
				Bit 5: Hardware Failure
				Bit 6: Restart After Shed
				Bit 7: Configuration/ Calibration Memory Changed
				2) Writing any value to this register via Function Code 6 clears bits 6 and 7 only

Loop Value Register Map

Table 12-6: Loop Value Register Map

Parameter Description	Register Address		Access	Description
	Hex	Decimal		
PV	0040	40065	R	Floating Point in Engineering Units.
Working Set Point	0044	40069	R	Floating Point in Engineering Units.
Input #1	0048	40073	R	Floating Point in

Parameter Description	Register Address		Access	Description
	Hex	Decimal		
				Percentage.
PV Low Range	0056	40087	R	Floating Point in Engineering Units.
PV High Range	0058	40089	R	Floating Point in Engineering Units.
Alarm #1 SP #1	005A	40091	R/W	Floating Point in Engineering Units.
Alarm #1 SP #2	005C	40093	R/W	Floating Point in Engineering Units.
Alarm #2 SP #1	006E	40111	R/W	Floating Point in Engineering Units.
Alarm #2 SP #2	0070	40113	R/W	Floating Point in Engineering Units.
SP Low Limit	0074	40117	R/W	Floating Point in Engineering Units.
SP High Limit	0076	40119	R/W	Floating Point in Engineering Units.
Working Set Point	0078	40121	R/W	Floating Point in Engineering Units.
PV Override Value	0080	40129	R/W	Floating Point in Engineering Units.
SP Override Value	0082	40131	R/W	Floating Point in Engineering Units.
Deviation	008A	40139	R	Floating Point in Engineering Units.
Aux Output	00A2	40163	R	Floating Point in Engineering Units.
Input 1 Bias	00AA	40171	R/W	Floating Point in Engineering Units.
Shed Enable	00F8	40249	R/W	Bit Packed Bit 0: 0: Disable 1:

Parameter Description	Register Address		Access	Description
	Hex	Decimal		
				Enable
Loop Status	00FE	40255	R	Bit Packed
				Bit 0: Unused
				Bit 1: Unused
				Bit 2: Unused
				Bit 3: Unused
				Bit 4: Unused
				Bit 5: Unused
				Bit 6: CSP
				Bit 7: Unused
				Bit 8: Unused
				Bit 9: Unused
				Bit 10: Unused
				Bit 11: Unused
				Bit 12: 1 = Any Digital Input Active
				Bit 13: 1 = Any Alarm Active
				Bit 14: Unused
				Bit 15: Unused

Analog Input Register Map

Use the identifying codes listed in the following table to read the specific items.

A Write request for these codes will result in an Error message.

Table 12-7: Analog Input Parameters

Parameter Description	Register Address		Access	Description
	Hex	Decimal		
Analog Input 1	1800	46145	R	Floating Point in Engineering Units.
Analog Input 2	1802	46147	R	Floating Point in Engineering Units.

Math, Calculated Value, or Variable Register Map

Table 12-8: Math, Calculated Value, or Variable Register Map

Parameter Description	Register Address		Access	Description
	Hex	Decimal		
Math Value #1	18C0	46337	R	Floating Point in Engineering Units.

Math or Calculated Value Status Register Map

Table 12-9: Math or Calculated Value Status Register Map

Parameter Description	Register Address		Access	Description
	Hex	Decimal		
Math Status #1 ~ #16	1AC0	46849	R	Bit Packed: Bit 0: Math #1 Status ⋮ Bit 15: Math #16 Status 0: Math OFF 1: Math ON

Shed Timer Reset Register Map

Table 12-10: Shed Timer Reset Register Map

Parameter Description	Register Address		Access	Description
	Hex	Decimal		
Math Status #1-#16	1B90	47057	W	Signed 16 bit integer Write this address to clear an infinite shed condition. (Shed time = 0) Data is ignored.

Alarm Status Register Map

Table 12-11: Alarm Status

Parameter Description	Register Address		Access	Description
	Hex	Decimal		
Alarm Status #1 ~ #16	1BF0	47153	R	Bit Packed: Bit 0: Alarm #1 Status ⋮ Bit 15: Alarm #16 Status 0: Alarm OFF 1: Alarm ON

Alarm Set Point Value Register Map

Table 12-12: Alarm Set Point Value Register Map

Parameter Description	Register Address		Access	Description
	Hex	Decimal		
Alarm Set Point Value 1	1C00	47169	R/W	Floating Point in Engineering Units.

Parameter Description	Register Address		Access	Description
	Hex	Decimal		
Alarm Set Point Value 2	1C02	47171	R/W	Floating Point in Engineering Units.
Alarm Set Point Value 3	1C04	47173	R/W	Floating Point in Engineering Units.
Alarm Set Point Value 4	1C06	47175	R/W	Floating Point in Engineering Units.

13

MODBUS COMMUNICATION EXCEPTION CODES

What's in this section?

The following topics are covered in this section.

In this section:

Introduction

When a master device sends a query to a responder device it expects a normal response. One of four possible events can occur from the master's query:

- Responder device receives the query without a communication error and can handle the query normally.
  It returns a normal response.

- Responder does not receive the query due to a communication error No response is returned. The master program will eventually process a time-out condition for the query.

- Responder receives the query but detects a communication error (parity, LRC or CRC).
  No response is returned. The master program will eventually process a time-out condition for the query.

- Responder receives the query without a communication error but cannot handle it (i.e., request is to a non-existent coil or register). The responder will return with an exception response informing the master of the nature of the error (Illegal Data Address.)

The exception response message has two fields that differentiate it from a normal response:

Function Code Field

In a normal response, the responder echoes the function code of the original query in the function code field of the response. All function codes have a most-significant bit (MSB) of 0 (their values are below 80 hex). In an exception response, the responder sets the MSB of the function code to 1. This makes the function code value in an exception response exactly 80 hex higher than the value would be for a normal response.

With the function code's MSB set, the master's application program can recognize the exception response and can examine the data field for the exception code.

Data Field:

In a normal response, the responder may return data or statistics in the data field. In an exception response, the responder returns an exception code in the data field. This defines the responder condition that caused the exception.

Query

Example: Internal slave error reading 2 registers starting at address 1820h from slave at slave address 02.

    02 03 18 20 00 02 CRC CRC

Response

Example: Return MSB in Function Code byte set with responder Device Failure (04) in the data field.

    02 83 04 CRC CRC

Table 13-1: Modbus RTU Data Layer Status Exception Codes

Exception Code	Definition	Description
01	Illegal Function	The message received is not an allowable action for the addressed device.
02	Illegal Data Address	The address referenced in the function-dependent data section of the message is not valid in the addressed device.
03	Illegal Data Value	The value referenced at the addressed device location is no within range.

14 ETHERNET TCP/IP

What's in this section?

The following topics are covered in this section.

In this section:

Overview

Ethernet parameters can only be configured via the Communication set up group, or Honeywell EasySet.

Ethernet IP Address is 10.0.0.2 as shipped from the Factory.

The MAC address is printed on the case label of each instrument.

Widely used by manufacturers, the Ethernet connection, which uses Modbus TCP/IP, allows the controller to connect to other Ethernet networks and exchange data with computers or devices on that network for monitoring or managing your process from almost any location.

When constructing a network, it is recommended that a Switch be used to connect UDCs to a LAN rather than using a Hub. This is because a Switch passes only those messages for IP addresses that are connected to the Switch while a Hub passes all message traffic. Using a Switch thus improves the overall throughput of the traffic to and from the UDCs.

To secure the network communication, it is recommended to use IP security (IPSec) to set up a Virtual Private Network (VPN).

Figure 14-1: Private network
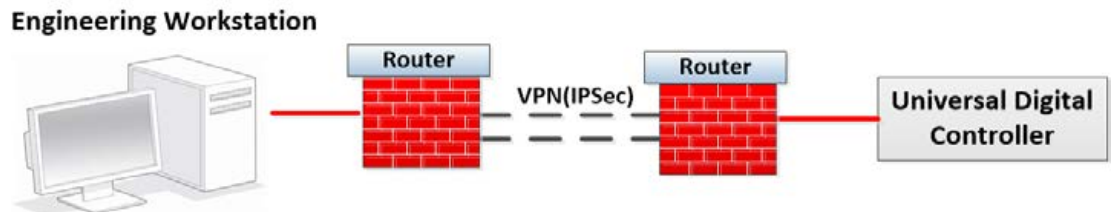
Figure 14-2: Public network
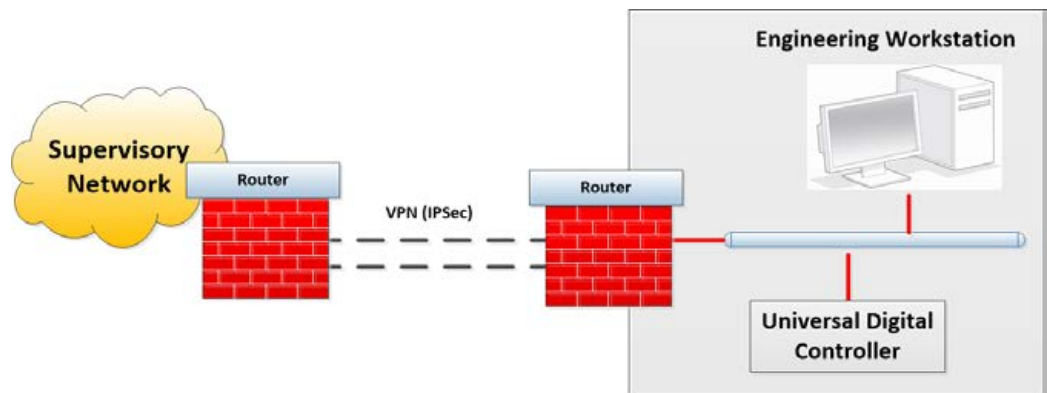
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