HARDWARE

CHAPTER

1

In this Chapter...

Introduction

The Purpose of This User's Manual

Thank you for purchasing our *STRIDE*® Pocket Portal series Industrial Internet of Things (IIoT) Bridge for data logging. This manual describes our Pocket Portal bridge and service, its specifications and included components, and provides you with important information for installation, connectivity and setup.

Technical Support

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Conventions Used

*When you see the "notepad" icon in the left-hand margin, the paragraph to its immediate right will be a special note. The word **NOTE:** in boldface will mark the beginning of the text.*

When you see the "exclamation mark" icon in the left-hand margin, the paragraph to its immediate right will be a warning or a caution. This information could prevent injury, loss of property, or even death (in extreme cases). The words WARNING or CAUTION: in boldface will mark the beginning of the text.

STRIDE Pocket Portal Product Overview

The *STRIDE* Pocket Portal connects your legacy devices to the cloud in the most value conscious and easy to use solution available.

This includes the *STRIDE* Pocket Portal bridge hardware and a data use subscription sized for your application.

The solution supports a Modbus device on an RS-485 network, up to four Digital I/O and up to two Analog inputs.

Hardware Overview

The *STRIDE* Pocket Portal is created with performance and a multitude of hardware capabilities in mind.

The device collects data from your Modbus slave and local digital and analog inputs, and uploads it to the cloud platform for data logging at a rate you decide. It contains a 512kB data cache (system and I/O data total) to handle any interruptions in Internet connectivity. It can be directly panel mounted, or DIN rail mounted with an optional adapter.

Wi-Fi LED

Power LED

Bluetooth LED*

Bluetooth ON/OFF*

Reset Button

Local I/O Connector

Power & RS-485

* Bluetooth is used for provisioning/setup only.

⚠️ **SAFETY NOTICE: The *STRIDE* Pocket Portal allows the user to connect to remote industrial controls equipment. The remote user may operate and monitor the local control system and affect the function and control of the application just as the local operator controls it. Proper Control, Security and Safety Procedures should be considered and implemented when writing data to a remote device or system.**

Specifications

Modbus Serial Interface	
Port Connector	4-pin pigtail connector (shared with power)
Interface Mode	RS-485
Supported Baud Rates	2400bps–115.2 kbps
Parity	Odd, Even or None
Data Bits	8 bits
Stop Bits	1 or 2
Flow Control	None
Termination	Internal 130 ohm
ESD Protection	8kV
Isolation Protection	NA
Serial Devices Supported	1 Modbus Slave
Protocols Supported	Modbus RTU Master

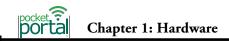| Local Input/Output Connections	
Power Output (5V/0.5A Out)	5VDC +/- 5% 500mA Maximum
Digital Input/Output	4 Pins configured as Input/Output
Digital Input/Output Type	Sinking/Sinking
Pullup Reference (DI Ref)	-0.7 V – 26V
DIO 1 – DIO 4 Input Mode	+0.7 V to Pullup Ref + 0.7 V
DIO 1 – DIO 4 Output High Mode	3.3–24 VDC, 10mA max source
DIO 1 – DIO 4 Output Low Mode	0VDC, 10mA max sink
Analog Input	2 Analog Inputs (0–10 VDC/4–20 mA)
Analog Input Resolution	16-bit
AI 1 and AI 2 Absolute Maximum Voltage	11V maximum
AI 1 and AI 2 Max Continuous Current	22mA

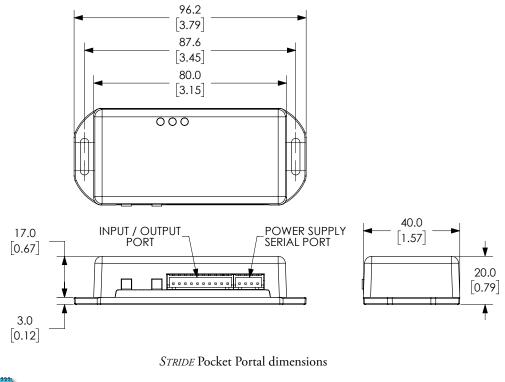| Wi-Fi Interface for Cloud Connectivity	
IEEE Wi-Fi Standard	802.11 b/g/n
Speed	Up to 72.2 Mbps
Frequency Band	2400 MHz
Antenna	Internal PCB Antenna
Network Ports Required	53 DNS 123 NTP 443 HTTPS (TLS) 8883 MQTT

Power Details	
Input Voltage	12–24 VDC
Max. Input Voltage Range	10–26 VDC
Power Consumption	Max 10W
Appliance Class	NA
Reverse Power Protection	Yes
Overload Protection	NA

Environmental	
Operating Temperature Range	-20°C to +70°C [-4°F to 158°F]
Storage Temperature Range	-40°C to +85°C [-40°F to +185°F]
Humidity	5 to 85% RH (non-condensing)
Protection Level	Plastic case, IP40
EMI	EN 55032 Class A
	FCC Part 15 Subpart C (15.247)
EMS	IEC61000-4-2 (ESD): ±4kV (contact), ±8kV (air discharge)
	IEC 61000-4-3 (RS): 10V/m (80MHz–6GHz)
	IEC 61000-4-6 (CS): 10V (150KHz–80MHz)
Mechanical Standards	IEC60068-2-64 (Random Vibration)
	IEC60068-2-32 (Drop Test / Free Fall)
Agency Approvals	CE, FCC

Dimensions

units: mm [in]

STRIDE Pocket Portal dimensions

NOTE: *Maintain 20mm [0.79 inches] clearance around device.*

Installation

Installation and Removal Procedures

The *STRIDE* Pocket Portal may be used indoors only. It is designed to be cooled using natural convection. For proper cooling, you must provide a clearance of at least 20mm [0.79 inches] above and below the device. Also, allow at least 20mm [0.79 inches] of depth between the front of the device and the inside of the enclosure. There are no restrictions on mounting orientation.

The device can be directly mounted to a panel using #5 or smaller screws, or can be optionally mounted to DIN rail.

NOTE: *Installation in a metal cabinet is not recommended, as the cabinet may block the Wi-Fi signal.*

Installing and Removing from DIN rail

The device can be snapped onto a standard 35 mm x 7.5 mm height DIN rail using a pair of AutomationDirect DIN rail adapters DRA-2B.

To mount the device on a DIN rail, (1) Clip the brackets onto the rail and (2) attach the device to the rail with the screws included with the bracket kit. To remove the device, (A) pry each bottom tab downward with a screwdriver and (B) lift off the rail.

Guidelines for Installing the STRIDE Pocket Portal

When designing the layout of your system, always separate the devices that generate high voltage and high electrical noise from the low-voltage, logic-type devices such as the Pocket Portal. Also consider the heat-generating devices and locate the electronic-type devices in the cooler areas of your cabinet. Reducing the exposure to a high-temperature environment will extend the operating life of the Pocket Portal.

Route wires to avoid placing low-voltage signal wires and communications cables in the same tray with AC power wiring and high-energy, rapidly-switched DC wiring.

Wiring

Wiring Guidelines

⚠️ **WARNING: To minimize the risk of potential safety problems, you should follow all applicable local and national codes that regulate the installation and operation of your equipment. These codes vary from area to area and it is your responsibility to determine which codes should be followed, and to verify that the equipment, installation, and operation are in compliance with the latest revision of these codes.**

Equipment damage or serious injury to personnel can result from the failure to follow all applicable codes and standards. We do not guarantee the products described in this publication are suitable for your particular application, nor do we assume any responsibility for your product design, installation, or operation.

If you have any questions concerning the installation or operation of this equipment, or if you need additional information, please call technical support at 1-800-633-0405 or 770-844-4200.

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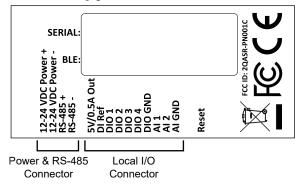
Proper grounding and wiring of all electrical equipment is important to help ensure the optimum operation of the Pocket Portal IIoT Bridge and to provide additional electrical noise protection for your application.

⚠️ **WARNING: Do not terminate communication leads while the plug-in connector is connected to a powered device.**

Wiring Connections

The Pocket Portal comes with a female 4-pin plug-in connector for its power and RS-485 connection, and a female 10-pin plug-in connector for its digital I/O and analog inputs. Both connectors include a 24-inch pigtail with tinned leads.
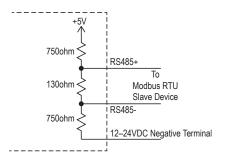
Power Supply and Serial Port

The *STRIDE* Pocket Portal can be powered from the same 12 to 24 VDC source that is used to power your other devices. Recommended DC power supplies are AutomationDirect.com part number PSL-12-010 or PSL-24-010.

The device uses a 2-wire RS-485 interface, with an internal terminating resistor.
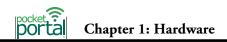
12–24 VDC Power +
12–24 VDC Power −
RS-485 +
RS-485 −

Power Supply and RS-485 Port	
Input Voltage	12–24 VDC
Max. Input Voltage Range	10–26 VDC
Power Consumption	Max 10W
RS-485 Voltage Range	-7.0 V to 9.6 V

The RS-485 connection has internal termination and pullup/pulldown resistors.

+5V

750ohm

RS485+

To
Modbus RTU
Slave Device

130ohm

750ohm

RS485-
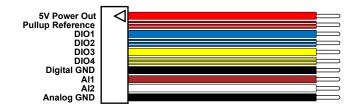
12–24VDC Negative Terminal

The external Modbus RTU device should share the same power supply reference (12–24 VDC negative terminal) as this device, or it must have an isolated RS-485 communications port.

Digital I/O and Analog Inputs

The STRIDE Pocket Portal provides four digital input/outputs and two analog inputs, with pinouts as defined below.

| 5V Power Out |
| Pullup Reference |
| DIO1 |
| DIO2 |
| DIO3 |
| DIO4 |
| Digital GND |
| AI1 |
| AI2 |
| Analog GND |

Local Input/Output Connections	
Output Power	5VDC +/- 5%
Output Current	500mA maximum
Pullup Ref	-0.7V – 26V
DIO 1 – DIO 4 Input Mode	+0.7V – Pullup Ref + 0.7V
DIO 1 – DIO 4 Output High Mode	3.3 VDC to 24 VDC, 10mA max source
DIO 1 – DIO 4 Output Low Mode	0VDC, 10mA max sink
AI 1 and AI2 Absolute Maximum	11V
AI 1 and AI 2 Max Continuous Overload	22mA

Note: Digital inputs are sinking and need a dry contact to drive them.
Digital Outputs are 10mA maximum sink/source.
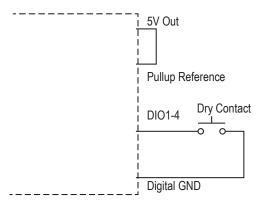
Digital Input Wiring

Digital inputs are sinking type, meaning the external circuit must drive the input low. I/O are configured as inputs by default.

Ensure unused leads are protected and secured to prevent unintentional short.
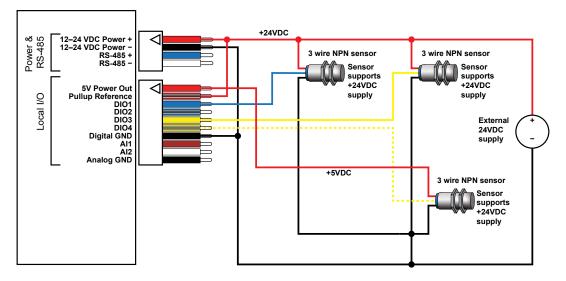
WARNING: Configuring DIO as an output when an external driver is connected may damage the DIO. Also note that all device I/O are non-isolated. Dry contact drivers are recommended.

Inputs driven using sinking driver, including dry contact such as pushbuttons or relays, should drive the Pullup Reference. The 5V output is available as a convenient source:

Sinking Digital Input Example

The Pocket Portal can accommodate a combination of both 24VDC digital inputs and 5VDC digital inputs by using the 5V Power Out terminal to power the 5VDC sensors, as shown below.
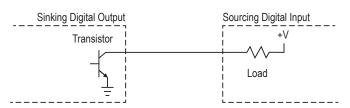
Digital Output Wiring

Digital outputs are primarily sinking type and capable of sinking about 10mA of current. The outputs have a limited drive capability of 3.3–24 VDC@10mA.

When connecting to external inputs that require higher voltages, use the Pullup Reference to pull the output up to the target voltage.

Ensure your circuit design limits output current to less than 10mA. A current limiting resistor may be required.

> **WARNING: All device I/O are non-isolated. When using external device to drive Pullup Reference, make certain the external device GND and Digital GND signals are connected together. Ideally both this device and the external device should be using the same DC power supply.**

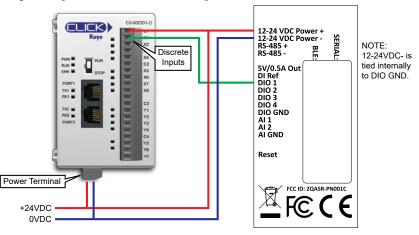**Sinking Digital Output Circuit**

With the right external driver (relay, etc) attached to the digital output, the digital output may be used to drive stack indicator lamps. These outputs are not intended for process critical applications. The digital output is suitable for non-critical signaling such as indicator lamps on panels or stack indicator lights. Using them to enable/disable motors is not recommended.
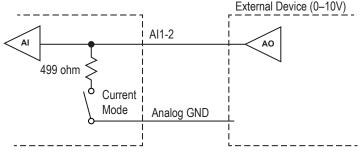
> *NOTE: When the graphic of the slide controlling a digital output is in the left position, the voltage will be high from the DIOn terminal to the COM/Power+ terminal.*

Although it seems obvious to use the RS485 Modbus RTU connection to a CLICK controller, a digital output would be wired as an input into CLICK as shown below:
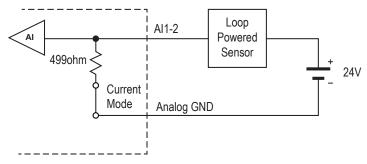
Analog Input Wiring

Analog inputs support either 0–10 VDC or 4–20 mA input modes. The input mode for each input is individually software selectable. Sensors connected to the analog input must be sourcing type.
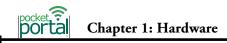

Example 0–10V Sensor

For a 4–20mA loop powered sensor, a 24VDC is necessary. The device is non isolated, so the sensor and the Pocket Portal must be powered from the same 24V DC power supply. The onboard resistor value is 499 Ω.

Example 4–20mA Sensor

Operation

Configuration and operation of the Pocket Portal is primarily conducted using the platform's web app and mobile app, as discussed in Chapter 2. The hardware indicators and controls are described here.

* Bluetooth is used for provisioning (setup) only.

LED Status Indicators

The *STRIDE* Pocket Portal has three status LEDs, as shown below.

LED Indicators	
Wi-Fi LED	LED OFF – Wi-Fi not provisioned SLOW BLINK – Connecting to Wireless Access Point FAST BLINK –Connecting to Pocket Portal Cloud Service LED ON – Connected to Pocket Portal Cloud Service
Power LED	LED OFF – Power OFF LED ON – Power ON
BLE LED (Bluetooth Low Energy, used to provision Pocket Portal)	LED OFF – BLE off or not advertising SLOW BLINK – BLE advertising LED ON – Connected to mobile app

Bluetooth Control

The blue Bluetooth button is used to activate Bluetooth for initial setup of the device. Bluetooth is not used other than for initial configuration.

Reset to Factory Default

The *STRIDE* Pocket Portal can be reset to the factory default settings by pressing and holding the yellow reset button for 10 seconds.

⚠️ **WARNING: This action cannot be undone. You'll have to re-register your device on the *STRIDE* Pocket Portal platform and complete the configuration steps again.**

Agency Approvals

Applicable Safety Standards

The *STRIDE* Pocket Portal was tested and passed the following standards.

Applicable Safety Standards	
Standards	*Description*
EN 55032 Class A	Electromagnetic Compatibility of Multimedia Equipment
EN 61000-4-2	Electrostatic discharge immunity test
EN 61000-4-3	Radiated, Radio-frequency, Electromagnetic Field Immunity Test 80-1000 MHz
EN 61000-4-6	Immunity to Conducted Disturbances, Induced by Radio-frequency Fields

FCC Compliance

The product described in this User Manual complies with Part 15 of the FCC Rules. The *STRIDE* Pocket Portal is a class B Information Technology Equipment (ITE) device.

Operating is subject to the following conditions:

• This device may not cause harmful interference, and

• This device must accept any interference received, including interference that may cause undesired operation.
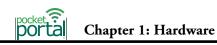
WARNING: This antenna and transmitter must be installed with a separation distance of at least 20cm from all persons and must not be co-located or operated in conjunction with any other antennas or transmitters.

Certifications

The *STRIDE* Pocket Portal has been tested and certified for:

• **CE** certification

• **FCC** verification