

Conveyor Belt Scale Instruction Manual
Rice Lake 1280 Controller
BCi Scale Frame
MagCon 100 Speed Sensor

11/16/2023

Kaskaskia Valley Scale Co.

1280 Enterprise™ Series Programmable Weight Indicator and Controller

- Graphical color display that adjusts for ambient light conditions
- Highly customizable graphical user interface
- Three different enclosure types: universal with tilt stand, panel mount and wall mount
- Resistive color touchscreen that can be used with gloves
- On-screen keyboard available during entry mode or use an external keyboard
- Multi-language operation and text entry
- Keypad for scale operations, numeric entry and navigation
- More than 150 built-in functions for programming
- Customize applications and data tables with iRite™ software
- Built-in web server for remote access, systems integration and data monitoring
- Up to eight scales supporting five scale types:
 - Analog load cell scales
 - Total scales
 - Serial scales
 - Program scales
 - iQUBE²® scales
- Multi-range/interval weighing functions
- Eight digital I/O for control and pulse count
- 100 setpoints, 18 configurable setpoint types
- 22 softkeys with 10 user-defined
- Two RS-232 and RS-485 serial ports
- USB, Ethernet TCP/IP, Wi-Fi Direct® and Bluetooth® ports
- Six option slots that support:
 - A/D scale channels
 - Analog Input/Thermocouple
 - Digital input and outputs
 - Analog outputs
 - Serial ports
 - Four channel dry-contact relay
 - Multiple network protocol interfaces

Power:

AC voltages: 100-240 VAC; 50-60 Hz
 DC voltages: 11-30 VDC
 Consumption: 60W

Excitation Voltage:

10 ± 0.5 VDC
 16 x 350Ω or 32 x 700Ω load cells per A/D card

Analog Signal Input Range:

-60 mV to 60 mV

Analog Signal Sensitivity:

0.3 μV/graduation minimum at 7.5 Hz–120 Hz
 1.0 μV/graduation recommended

A/D Sample Rate:

7.5 to 960 Hz, software selectable with Three stage, Adaptive or Damping A/D filters

Resolution:

Internal: 8 million counts/8,000,000
 Display: 1,000,000

System Linearity

± 0.01% full scale

Digital I/O:

Eight I/O channels on CPU board
 Optional 24-channel I/O expansion boards

Communication Ports:

Port 1 & 2: Full duplex RS-232 with CTS/RTS, RS-422/485

Baud Rate: 1200 to 115200

Port 3: USB 2.0 Device (Micro)

Port 4: Bluetooth® SPP 2.1+EDR

USB Host: (2) Type A Connectors max 500 mA

Ethernet: Wired 10/100 Auto-MDX

Ethernet: Wireless 802.11 b/g/n 2.4GHz

Onboard:

Embedded Linux® OS
 8 GB eMMC (system use) 1 GB DDR3 RAM
 460 MB onboard database (SQLite) storage
 Up to 32 GB micro SD card (sold separately)

Display:

Seven-inch, 800 x 480-pixel, graphical color TFT display 500 or 1,000 NIT
 Twelve-inch, 1280 x 800-pixel, graphical color TFT display 1,500 NIT

Keys/Buttons:

22-key membrane panel, tactile buttons, on-screen keyboard for text and numeric entry, USB port for flash drive, keyboard and printer

Temperature Range:

Certified: 14°F to 104°F (-10°C to 40°C)
 Operating: -4°F to 131°F (-20°C to 55°C)

Weight:

Universal enclosure: 11 lb (4.9 kg)
 Panel mount enclosure: 8 lb (3.6 kg)
 Wall mount enclosure: 23 lb (10.4 kg)
 Panel mount 7 in touch-only: 7 lb (3.1 kg)
 Panel mount 12 in touch-only: 10 lb (4.5 kg)

Rating/Material:

Stainless steel 304 enclosure
 Universal: IP69K
 Wall mount: IP66
 Panel mount: IP69K, NEMA Type 4X and 12

Warranty:

Two-year limited warranty

EMC Immunity:

EN 50082 Part 2 IEC EN 61000-4-2, 3, 4, 5, 6, 8, and 11

Approvals:

NTEP CC 15-001/Class III/IIIL 10,000d
 Measurement Canada AM-5980C,
 Class III/III HD 10,000d
 OIML R76/2006-NL1-16.04 Class III/IIII 10,000d
 EU Test Certificate TC8596
 UL/cUL Listed (universal, wall mount)
 UL/cUL Recognized (panel mount)
 CE Marked

1.0 Introduction

The *1280 Enterprise Series* is a color touchscreen, programmable, multi-channel digital weight indicator/controller. Manufactured with industrial-grade components, the *1280* is built to achieve top performance, even in harsh environments. The *1280* features a Freescale i.MX6 microprocessor, Linux-based operating system and 1 GB onboard memory (expandable with micro SD card). Configuration can be performed using the front panel, serial commands or Revolution® scale software.

Custom programs can be written with iRite®, a domain-based programming language based off of Basic, Pascal and Ada—empowering programmers to customize display widgets, store and retrieve data with the onboard database, and utilize the 150+ built-in-functions. From tailored basic weighing to complex process automation, the *1280* delivers uncompromising speed for today’s most demanding applications as well as vast expandability for future needs.

Manuals can be viewed or downloaded from the Rice Lake Weighing Systems website at www.ricelake.com/manuals

Warranty information can be found on the website at www.ricelake.com/warranties

Onboard Features

Features of the *1280* include:

- Support for up to eight scales (combination of analog load cell, total, serial scales or program scales)
- Eight programmable Digital I/O bits available on the CPU board (connector J1) including onboard pulse input pins, with 24 additional per option card
- Two communication ports that support RS-232, RS-485 and RS-422
- Two USB host ports
- One USB device port
- AC or DC power options
- Ethernet – wired and wireless

Other Features

- Configurable print formats can be defined for up to 1000 characters each. These formats are used to print gross or net weights, setpoint weights, accumulator weights and header information. Additional print formats can be created with *iRite*.
- 100 configurable setpoints.
- The *1280* is NTEP-certified for Classes III and III L at 10,000 divisions.

Three Enclosure Types

- Universal
- Panel Mount
- Wall Mount

Option Cards

The CPU board provides six slots for installing scale or other option cards. Available option cards include:

- Single and dual-channel scale cards to drive up to sixteen 350-ohm load cells per card. Scale cards support both 4- and 6-wire load cell connections.
- Single and dual-channel analog output cards as 0–10 VDC, 0–20 mA or 4-20 mA outputs representing programmable scale values.
- 24-channel digital I/O expansion card
- Dual serial port card (with RS-232, RS-422 and RS-485)
- Single analog and dual analog output cards
- Dual analog input/thermocouple card
- 4-channel relay card
- CompactCom cards that supports various network protocols.

Network Protocol Option Cards:

Part #165792	Ethernet/IP CompactCom
Part #165793	DeviceNet CompactCom
Part #165794	ProfiNet CompactCom
Part #165796	Modbus TCP CompactCom
Part #165795	Profibus CompactCom
Part #179533	Ether CAT CompactCom
Part #182319	PowerLink CompactCom

1.1 Safety

General Safety

Do not operate or work on this equipment unless you have read and understood the instructions and warnings in this manual. Failure to follow the instructions or heed the warnings could result in injury or death. Contact any Rice Lake Weighing Systems dealer for replacement manuals. Proper care is your responsibility.

WARNING!

Failure to heed may result in serious injury or death.

Some procedures described in this manual require work inside the indicator enclosure. These procedures are to be performed by qualified service personnel only.

Do not allow minors (children) or inexperienced persons to operate this unit.

Do not operate without enclosure completely assembled.

Do not place fingers into slots or possible pinch points.

Do not use this product if any of the components are cracked.

Do not make alterations or modifications to the unit.

Do not remove or obscure warning labels.

Do not submerge.

Before opening the unit, ensure the power cord is disconnected from the power source.

1.2 Numeric/Alpha Entry

When data entry is required, a keyboard or a numeric keypad will display on the screen as shown in Figure 1-2 and 1-3. Additionally, the indicator's front panel is equipped with a numeric keypad as shown in Figure 1-4 on page 5.



Figure 1-2. 1280 On-screen Full Keyboard for Alphanumeric Entry

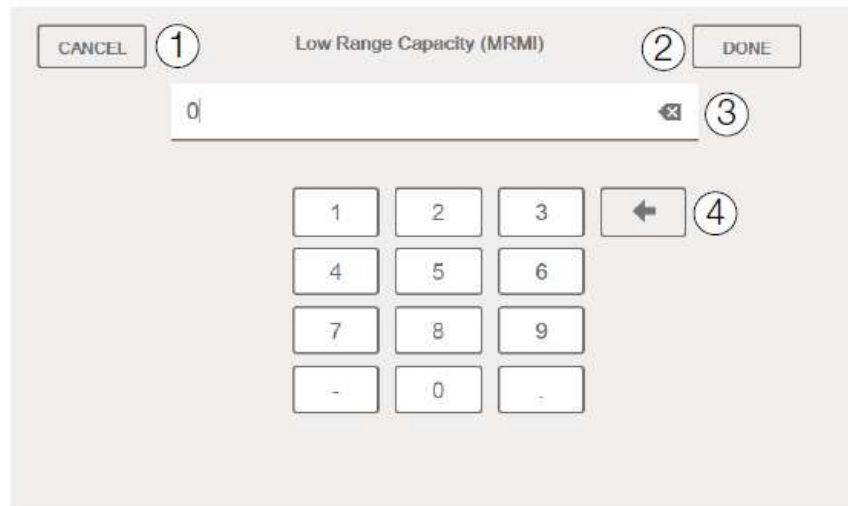


Figure 1-3. 1280 On-screen Numeric Keypad for Numeric Entry

Item No.	Description
1	Cancel - Press to exit keyboard.
2	Done - Press to complete keyboard entry.
3	Clear - Delete everything in the prompt line.
4	Backspace - Delete one character at a time.

Table 1-2. On-screen Keyboard Descriptions

1.3 Display with Keyboard



Figure 1-4. 1280 Front Panel

1.3.1 Navigation Keys

Navigation keys are primarily linked to program handlers. If no handlers exist, the navigation keys toggle through a selection of displayed scales.


1.3.2 Numeric Keypad


Use the numeric keypad for entering numbers or keyed tares.

Press **CLEAR** to backspace when entering numbers/letters.

Press **ENTER** to save entries from the numeric keypad.

1.4 Setup Menu

Press  on the Weigh mode screen. The *Main Menu* will display.

Press  to return to the Weigh mode.

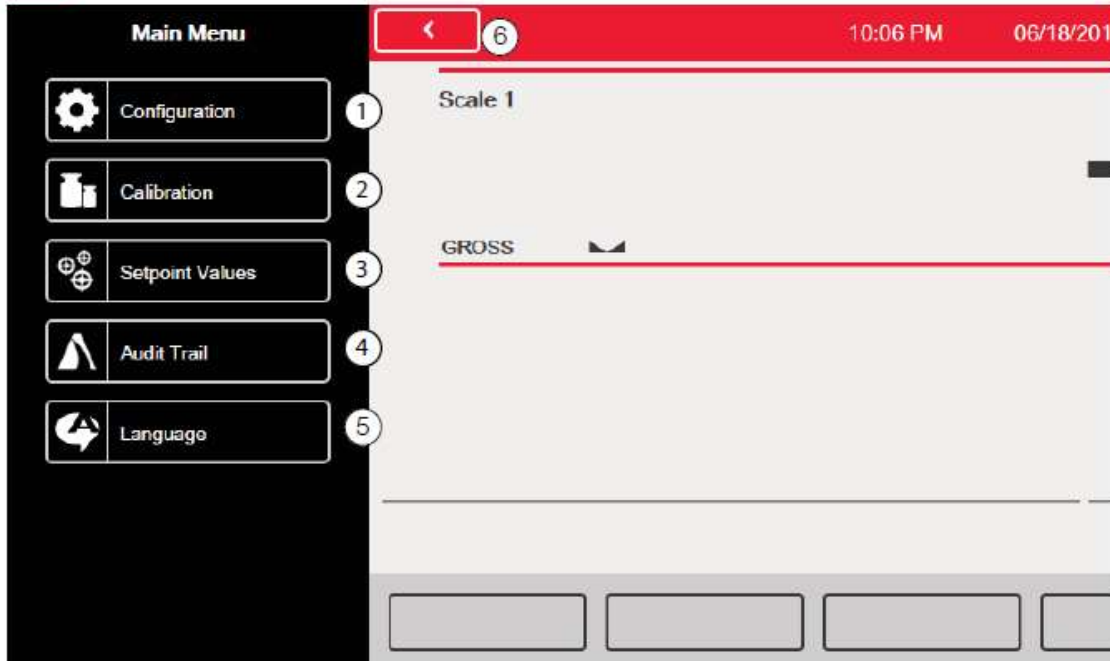


Figure 1-5. Main Menu Screen

Item No.	Description
1	Configuration – Allows setup of indicator parameters. See the 1280 Technical Manual.
2	Calibration – Allows calibration of the scale. See the 1280 Technical Manual.
3	Setpoint Values – Allows setup of setpoint values. See the 1280 Technical Manual.
4	Audit Trail – Provides tracking information for configuration and calibration events. See Section 1.5.1.
5	Language – Allows one of 16 languages to be selected for the indicator display. See Section 1.5.2.
6	Return Arrow – Press to return to Weigh mode from the Main menu screen.

Table 1-3. Main Menu Descriptions

2.0 Conveyor Belt Scale Application Setup

Scale Assignment Settings

The 1280 Controller when configured as a conveyor belt scale utilizes one loadcell based scale from either an A/D input card or a serial port connected to an iQube² digital summing card. This weight-based signal is configured as Scale 1. The belt scale specific variables are configured as program scales 2 through 5.

Scale 1	Loadcell A/D card or iQube ² configured serial port
Scale 2	Program Scale set as belt scale Master Total
Scale 3	Program Scale set as belt scale Reset Total
Scale 4	Program Scale set as belt scale Rate of Flow
Scale 5	Program Scale set as belt scale Belt Speed

Scale 1 must have the Accumulator setting enabled.

Setpoint batching, analog output signals, printer data, and field bus data are configured from reading values associated with each scale.

Digital I/O Settings

Digital I/O			
DIO (onboard) #1	Pulse Input	Alias	Speed_In
DIO (onboard) #2	Programmability	Alias	Run_In
DIO (onboard) #3	Programmability	Alias	Print_In
DIO (onboard) #4	Output	Alias	Tot_Out
DIO (onboard) #5	Output	Alias	DIO0_5
DIO (onboard) #6	Output	Alias	DIO0_6
DIO (onboard) #7	Output	Alias	DIO0_7
DIO (onboard) #8	Output	Alias	DIO0_8

At a minimum, the DIO #1 must be set as Pulse Input, and DIO #2 must be set as Programmability. DIO #5 through #8 can be reassigned as needed by the application.

Scale 1 is calibrated utilizing the 1280 configuration menu. Scales 2 though 5 are configured for maximum values and division size. Belt speed and dynamic weight are calibrated from the scale installed software application.

Prior to system startup, general values should be determined for static weight capacities, required units of measure, maximum rate of flow, and maximum belt speed.

Scale 1 calibration:

Determine loadcell size and number of loadcells.

Set scale capacity based on total loadcell capacity.

Format Primary units to loadcell units of measure.

Set division size and decimal point to a usable range of between 4,000 to 10,000 graduations.

NOTE:

Refer to iQube² manual for configuration of scale 1 when using the iQube² digital junction box.



3.0 Configuration Menu

Configuration has a series of menus that allow the parameters of the indicator to be set up. Detailed descriptions of the Scale Configuration, Communications, Features, Formats, Digital I/O, Analog Output, Setpoints and Diagnostics menus are provided in [Section 4.0](#) through [Section 11.0](#).

IMPORTANT

The audit trail jumper (JP1) needs to be disabled, in the off (right) position, in order to seal the setup switch with a lead wire seal. Access is not prevented simply by sealing the setup switch.

3.1 Access Setup Parameters

1. Press  on the weigh mode screen. The *Main Menu* will display.
2. Press  for access to the Configuration menu. If the Configuration menu does not appear, see the following note.



To access Configuration through the front panel (by pressing the button on the touchscreen, jumper JP1 needs to be in the on (left) position. In order to restrict access to Configuration using the front panel, JP1 needs to be in the off (right) position, requiring the setup switch to access Configuration. See [Figure 3-3 on page 46](#).

3. Access to the configuration menu may be restricted with a password. If prompted, enter the password and press . The Configuration menu displays. See [Section 3.3 on page 47](#).

See [Section 6.4 on page 75](#) for more information on passwords.

3.2 Access Configuration Menu – Sealed Indicator

If the indicator has been sealed, there is a jumper in place (JP1) that will not allow access to the configuration menu on the touchscreen. Use the following instructions to enter configuration on a sealed indicator.

1. Break the wire seal.
2. Remove the large fillister screw.
3. Use a non-conductive tool to press the setup switch inside the indicator.

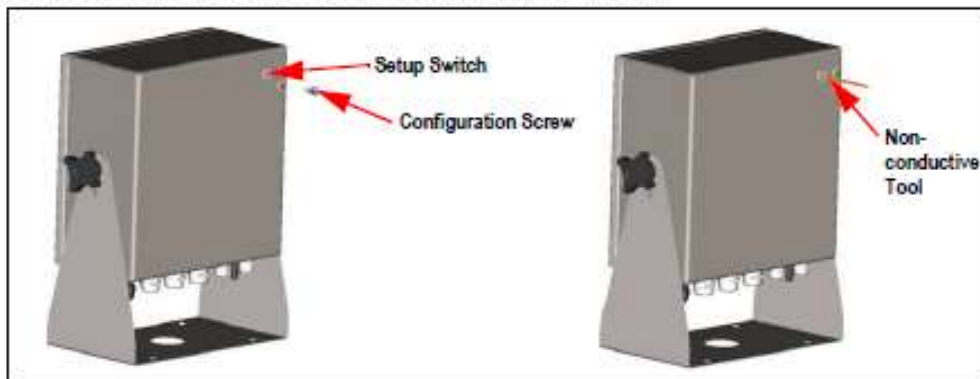


Figure 3-1. Setup Switch Location (Universal Enclosure)

IMPORTANT

Press lightly to avoid damaging the switch or board.



Figure 3-2. Setup Switch Locations (Panel/Wall Mount Enclosures)

4. Access to the configuration menu may be restricted with a password. If prompted, enter the password and press . The configuration menu displays, see [Section 3.3 on page 47](#).

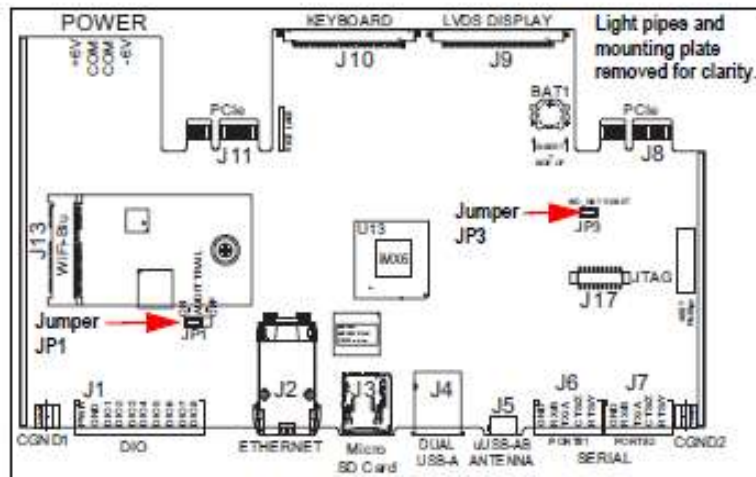


Figure 3-3. Jumper Locations



Note The front door to the indicator may also be sealed to prevent access to the hardware. This may be required in some Legal for Trade applications.

3.3 Configuration Menu



Figure 3-4. Configuration Menu

Item No.	Selection	Description
1	Scales Menu	Set the scale parameter, see Section 4.0 on page 49 .
2	Communications Menu	Set the communication parameters, see Section 5.0 on page 61 .
3	Features Menu	Set features parameters, see Section 6.0 on page 69 .
4	Formats Menu	Set the print and stream format parameters, see Section 7.0 on page 78 .
5	Digital I/O Menu	Assign functions to digital inputs and outputs, see Section 8.0 on page 85 .
6	Analog Outputs Menu	Used to configure the analog output, see Section 9.0 on page 87 .
7	Setpoints Menu	Used to configure setpoints, see Section 10.0 on page 89 .
8	Diagnostics Menu	Recalibrate touchscreen and set the backlight, see Section 11.0 on page 101 .
9	Save and Exit Button	Press to save settings and return to weigh mode.
10	Import From File	Press to import an existing file, see Section 13.0 on page 104 .
11	Export to File	Press to export files, see Section 13.0 on page 104 .
12	Safely Remove USB Storage Devices	Press to release the USB connection before removing the flash drive or USB cable to ensure the drive continues to work properly and does not become corrupt.
13	Reset to Factory Defaults	Press to restore all settings to factory defaults.
14	Partially Reset to Factory Defaults	Press to partially restore settings to factory defaults, this preserves Ethernet and scale settings.

Table 3-1. Configuration Main Menus

3.3.1 Configuration Menu Map

Figure 3-5 illustrates the menu structure in the configuration menu selections.

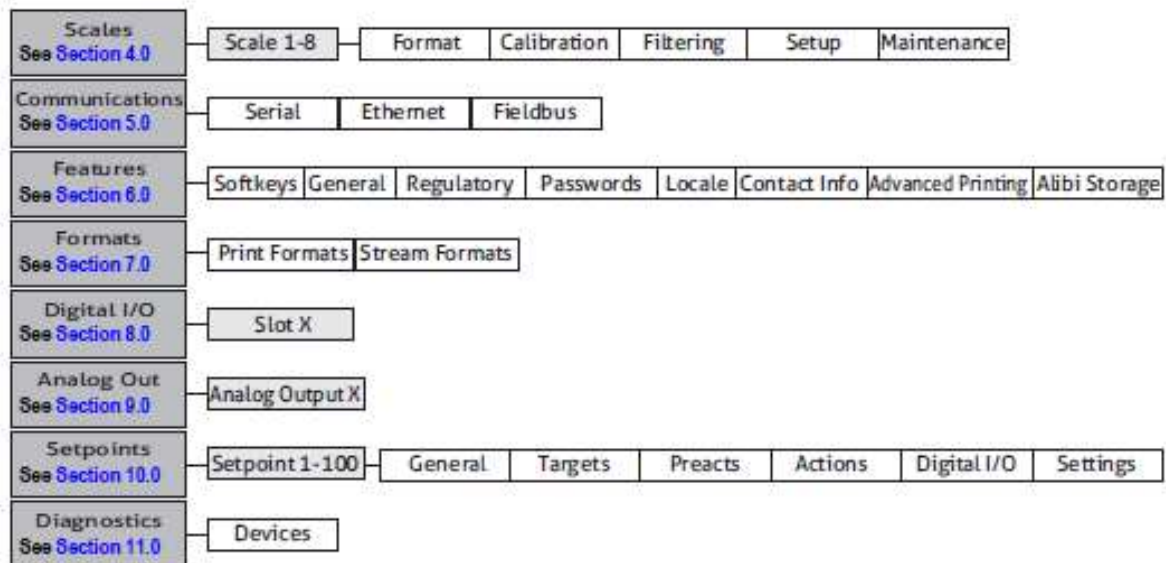




Figure 3-5. Configuration Menu Map

4.0 Scale Configuration

The Scales menu allows the setup of parameters for the type of scale to be set up.

From the *Configuration* menu, press  to enter the *Scales* menu. Once all parameters have been set, press  to return to weigh mode.

4.1 Scale Kind

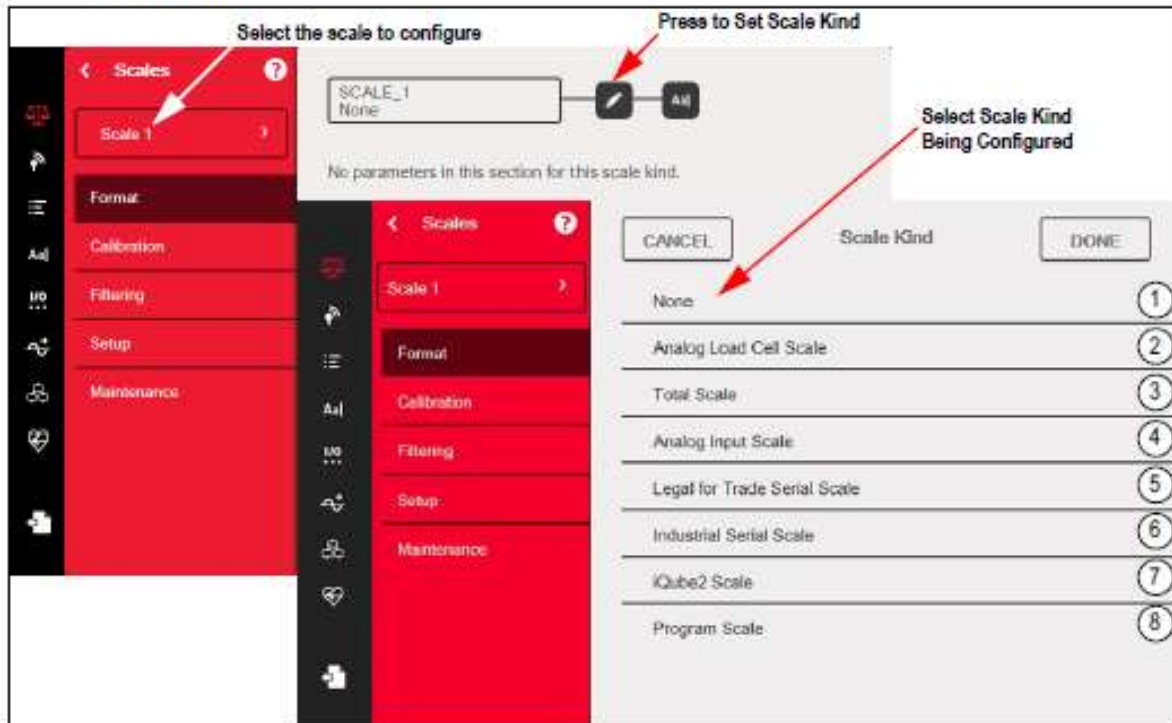


Figure 4-1. Select Scale Kind (Type)

Item No.	Parameter	Description
1	None	A scale kind is not be assigned to the scale number
2	Analog Load Cell Scale	An A/D scale card channel is used for scale (single or dual channel)
3	Total Scale	The output of two or more scales can be configured to function as a Total Scale <i>NOTE: The scale kind of a source scale cannot be changed once it is associated with a total scale.</i>
4	Analog Input Scale	Version 1.07 – an analog input card 0-10 V, 0-100 mV, 0-20 mA, 4-20 mA is used for scale
5	Legal for Trade Serial Scale	A scale receiving a stream of Legal for Trade weight data over a serial or Ethernet connection
6	Industrial Serial Scale	A scale receiving a stream of weight data over a serial or Ethernet connection; parameter values are configurable; scale functions zero and tare can be used
7	iCube2 Scale	Scale is connected to 1280 via an iCube ² Junction Box, see Section 5.4 on page 68
8	Program Scale	iRite program provides the scale data.

Table 4-1. Scale Kinds

Parameter	Default	Description
Primary Units	Pounds (lb)	Sets the units displayed or printed along with the scale weight.
Primary Decimal Position	8888888	Number of decimal places or fixed zeros to show for primary units. The default is 8888888 (no decimal places).
Primary Display Divisions	1	The division the scale counts by as the load changes. This setting is associated with the Primary Decimal Position. <i>Example: If the Decimal Position is set to 88888.8 and the Display Divisions are set to 5, it will count by 0.5 units.</i>
Secondary Units Enabled	Off	When set to Off, the Units key will not select this unit of measure to perform a weight conversion.
Secondary Units	Kilograms (kg)	Sets the units displayed or printed along with the scale weight.
Secondary Decimal Position	888888.8	Number of decimal places or fixed zeros to show for secondary units.
Secondary Display Divisions	5	The division the scale counts by as the load changes. This setting is associated with the secondary decimal position. <i>Example: If the Decimal Position is set to 88888.8 and the Display Divisions are set to 5, it will count by 0.5 units.</i>
Secondary Multiplier (Custom Units Only)	1	Use with custom units. It is the conversion factor applied to the primary units to convert weight for custom units. <i>Example: If primary units were lb and secondary custom units were gallons, there would be a secondary multiplier of 8 entered to show the relationship between lb and gallons.</i>
Tertiary Units Enabled	Off	When set to Off, the Units key will not select this unit of measure to perform a weight conversion.
Tertiary Units	Kilograms (kg)	Sets the units displayed or printed along with the scale weight.
Tertiary Decimal Position	888888.8	Number of decimal places or fixed zeros to show for tertiary units.
Tertiary Display Divisions	5	The division the scale counts by as the load changes. This setting is associated with the tertiary Decimal Position. <i>Example: If the Decimal Position is set to 88888.8 and the Display Divisions are set to 5, it will count by 0.5 units.</i>
Tertiary Multiplier (Custom Units Only)	1	Use with custom units. It is the conversion factor applied to the primary units to convert weight for custom units.
Custom Units One	—	Available to enter a name for custom units. Maximum length is 8.
Custom Units Two	—	
Custom Units Three	—	
Split Mode	Off	Multi-Range, Multi-Interval Settings; see Section 4.1.3 for more information.

Table 4-2. Scale Format (Continued)



Note Defaults are shown for NTEP mode.

The *Scale Format* menu will vary depending on which scale kind is being used. Only settings available for the selected scale kind will display on the screen. Options specific to the scale feature chosen will show in blue font on the screen.


Parameter	Default	Description
Analog Input Type	0-10 VDC	(Only Available in Analog Input Scale) Choose electrical signal type.
Full Scale Capacity	10,000	Capacity of the scale in primary units.
Primary Units Enabled	On	The 1280 is calibrated in Primary Units. When set to Off, primary units will not be displayed, but are still being evaluated in the background for all conversion functions.

Table 4-2. Scale Format

NOTE:

Refer to iQube² manual for configuration of scale 1 when using the iQube² digital junction box.

4.2 Scale Calibration

To enter Scale Calibration, press  and select *Calibration*.

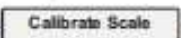
Parameters	Defaults	Description
Zero Calibration Counts	8386509	Calculated during calibration, it is the number of A/D counts after the zero calibration.
Span Calibration Weight	10,000	Display and edit the test weight value. Press Calibrate to calibrate the Span Calibration Point. See Section 4.2.1 on page 53 for more information on Span Calibration.
Span Calibration Counts	2186044	Calculated during calibration, this is the A/D count captured at the span/VWAL weight.
Capacity Calibration Counts	2186044	Calculated during calibration, this is the A/D count at full scale capacity. Note: If the scale is calibrated at full capacity, then Span Calibration Counts = Capacity Calibration Counts.
Linear Point Weight 1-4	0	The test weight value for the linear calibration point. Press Calibrate to calibrate the Linear Calibration Point, or Remove to remove it.
Linear Point Counts 1-4	0	The A/D count captured at the linear point weight.

Table 4-5. Calibration Menu





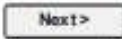

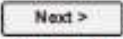
Note

Linear calibration points provide increased scale accuracy by calibrating the indicator at up to four additional points between the zero and span calibrations.

The  button begins a step-by-step procedure for calibration. See [Section 4.2.1](#).

4.2.1 Standard Calibration

Use the following steps to perform a standard calibration on a scale.

1. Select the scale to be calibrated and enter the calibration menu.
2. Press .
3. Select the method of calibration. Press .
For other methods calibration see:
 - [Section 4.2.2 on page 55](#) for multi-point calibration,
 - [Section 4.2.3 on page 55](#) for last zero calibration and
 - [Section 4.2.4 on page 55](#) for temporary zero calibration.
 - [Section 4.2.5 on page 56](#) for Theoretical Calibration
4. Select whether or not chains, hooks or other items used for applying weights will be used during calibration. Press .
5. Remove all weight from the scale except for chains and hooks (if used).
6. Press . The current weight and *Zero Calibration Complete* displays.
7. Press .
8. Enter Span weight for the value of the calibration test weights that will be used to calibrate the scale. This is required prior to running the span calibration.

NOTE:

Refer to iQube² manual for calibration of scale 1 when using the iQube² digital junction box.

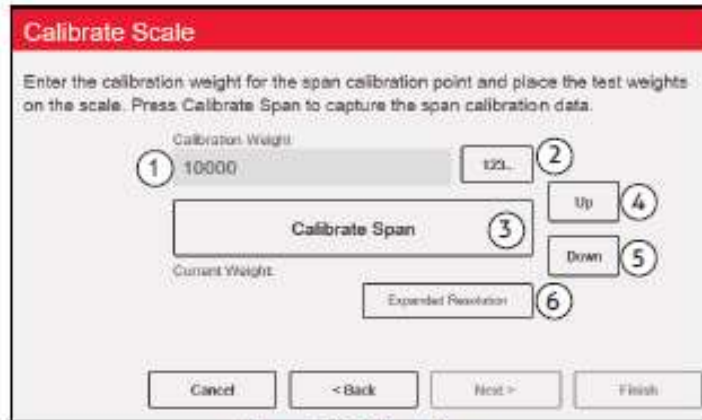


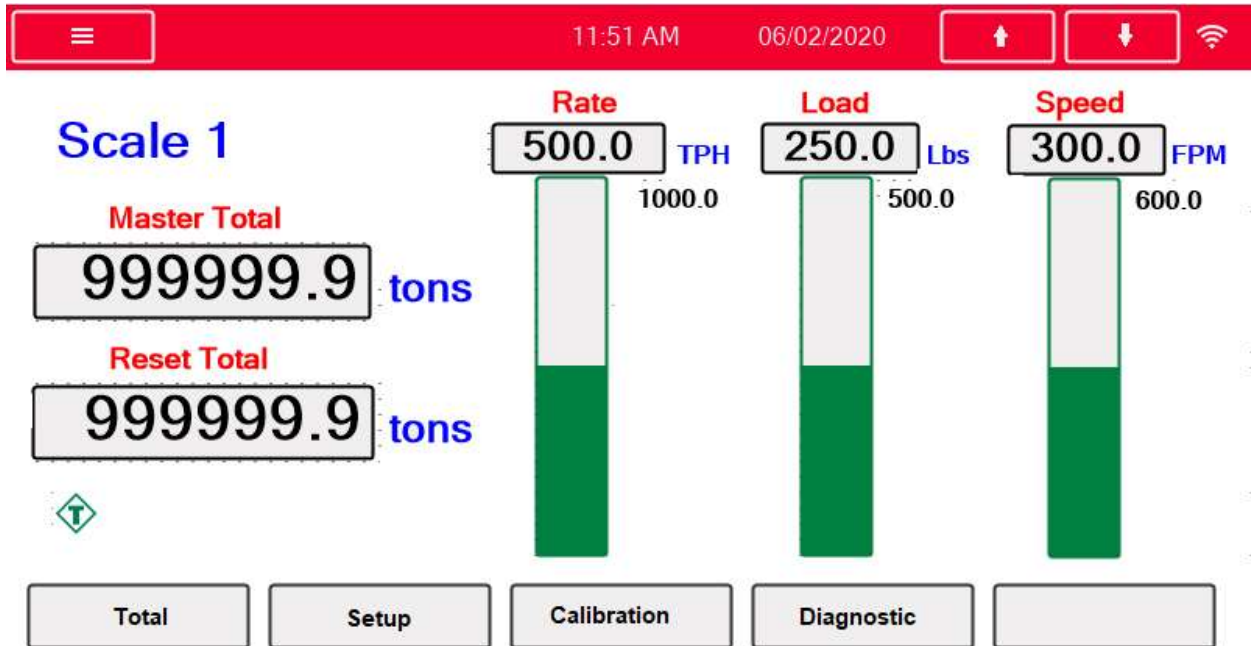
Figure 4-5. Calibrate Span

Item No.	Description
1	Calibration Weight Window – displays calibration weight value.
2	123... – press to enter or edit the calibration weight value. Increments based on scale division size or the expanded resolution.
3	Calibrate Span – press to calibrate span.
4	Up – calibration can be adjusted by changing the calibrated weight. Press Up to adjust the calibrated weight value up by one display division. Use the Expanded Resolution to adjust the calibrated weight value by a 10th of a display division
5	Down – calibration can be adjusted by changing the calibrated weight. Press Down to adjust the calibrated weight value down by one display division. Use the Expanded Resolution to adjust the calibrated weight value by a 10th of a display division
6	Expanded Resolution – increases the resolution by a factor of 10.

Table 4-5. Calibrate Span

9. Place the test weight on the scale.
10. Press . The current span weight will display.
11. Press . Calibration results are displayed.
12. Press . Display returns to the Calibration menu.
13. The re-zero function is used to remove a calibration offset when hooks or chains are used to hang the test weights during both zero and span calibration. If hooks or chains were used during calibration, remove these and the test weights from the scale.
14. Press .

5.0 Conveyor Belt Scale Application (Total Display)



5.01 Total Display

_Default display of Totals, Rate of Flow, Belt Loading, and Belt Speed. Unit ID is configurable in Base Configuration Features.


Reset Total is cleared by pressing the  key.

The Master Total is cleared by adding Softkey #7 from the features menu. See Alternate Display Setting in section 9.0.

5.1 Conveyor Belt Scale Application (Setup Display)

Menu		11:58 AM	02/04/2019	↑	↓	Wi-Fi
Master Total Units	Tons	# Weigh Idlers	1			
Reset Total Units	Tons	Idler Spacing	4	Feet		
Flow Rate Units	TPH	Display Filter	32			
Belt Speed Units	FPM	Remote Total Count	2000	lb		
Belt Length	500	Feet	Remote Total Duration	10		
Belt Test Revolutions	3		Auto Zero Track %	2		
Belt Test Time	360	Sec.	Deadband Track %	2		

5.11 Setup Display

Parameters are selected using the touch screen. Changes require  Key to be pressed.

Units variables cycle through available selections. Numeric variables are entered through on-screen numeric keypad.

Master Total Units: **Tons**, Metric Tons, Pounds, or Kilograms.

Reset Total Units: **Tons**, Metric Tons, Pounds, or Kilograms.

Flow Rate Units: **Tons per Hour**, Metric Tons per Hour, Pounds per Minute, or Kilograms per Minute.

Belt Speed Units: **Feet per Minute**, or Meters per Second.

Belt Length: Length of one revolution of conveyor belt.

Belt Test Revolutions: Number of revolutions to be measured.

Belt Test Time: Time duration for belt to complete entered test revolutions.

Weigh Idlers: Count of conveyor idlers on scale.

Idler Spacing: actual average spacing between idlers on scale.

Display Filter: Display damping filter (1-100).

Remote Total Count: Weight to pulse output relay.

Remote Total Duration: Closed pulse width of output relay.

Auto Zero Track %: Percentage of Rated Capacity for Auto Zero calibration to enable.

Dead Band Track %: Percentage of Rated Capacity for Dead Band to enable.

5.2 Conveyor Belt Scale Application (Calibration Display)

The screenshot shows a mobile application interface for conveyor belt scale calibration. At the top, a red header bar contains a menu icon, the time 12:05 PM, the date 02/04/2019, and navigation icons for up, down, and Wi-Fi. The main content area is divided into three calibration sections on the left and a status gauge on the right. The 'Tare Calibration' section has a 'CALIBRATE' button, the label 'Empty Belt Weight', and a numeric keypad showing '100'. The 'Span Calibration' section has a 'CALIBRATE' button, the label 'Loaded Belt Weight', a numeric keypad showing '1.00000', and a 'Weights' button with a numeric keypad showing '100.00'. The 'Belt Speed Calibration' section has a 'CALIBRATE' button, the label 'Speed Pulse Count', and a numeric keypad showing '6000'. On the right, the 'Calibration Status' is shown as a circular gauge with a green segment representing 50%. Below the gauge is an 'Exit' button.

5.21 Calibration Display

Calibration functions are selected using the touch screen.

Calibration values can be manually entered using the touch screen and the on-screen numeric keypad.

Tare

Tare calibration is performed on an empty running conveyor belt. The tare value is the representation of the average belt weight as registered on the scale.

Span

Span calibration is the dynamic adjustment based on the static calibration of Scale 1. The span value of 1.0000 applies no correction and is directly proportional to the scale weight.

Span calibration mode cycles between Ecal, Weights, or Material.

Span calibration with Ecal is performed on an empty running conveyor belt and the load is internally elevated in the program.

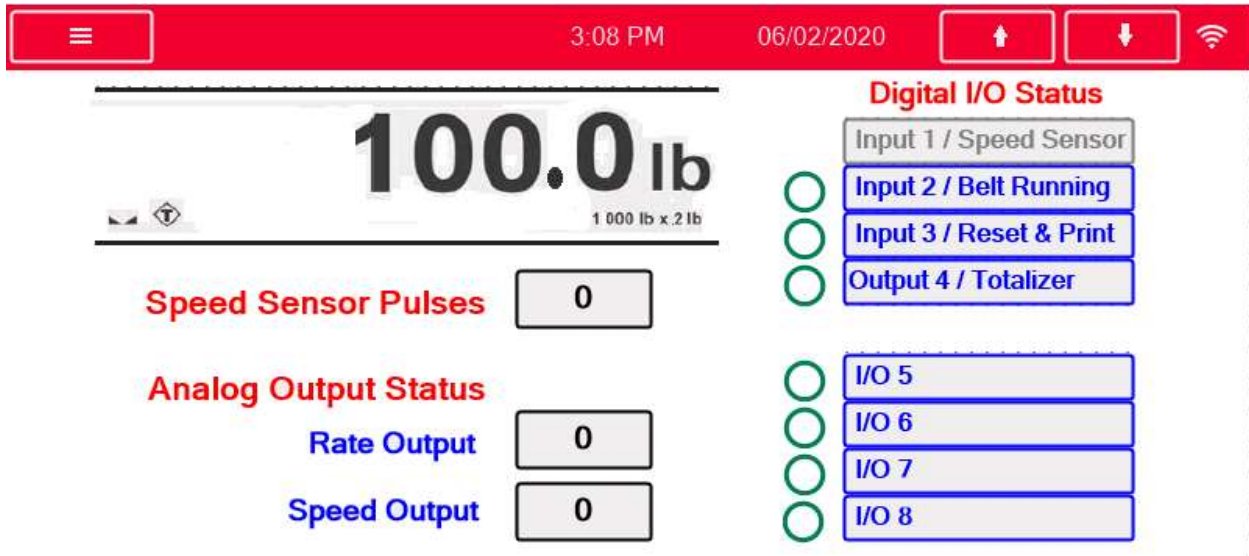
Span calibration with weights is performed on an empty running conveyor belt with the test weights applied.

Span with Material compares the Reset Total to the value entered.

Belt Speed

Belt Speed calibration acquires the speed sensor pulse count over the time entered in the Setup Parameters.

5.3 Conveyor Belt Scale Application (Diagnostic Display)



5.31 Diagnostic Display

Display of raw weight and speed signals.

Digital I/O Status displays relay from onboard I/O.

Digital I/O points 1 through 4 are preassigned. I/O points 5 through 8 can be configured through the Configuration menu.

Selecting the Rate or Speed Output value will force the Output to 100% while the diagnostic display is active.

6.0 Conveyor Belt Scale Initial Start Up

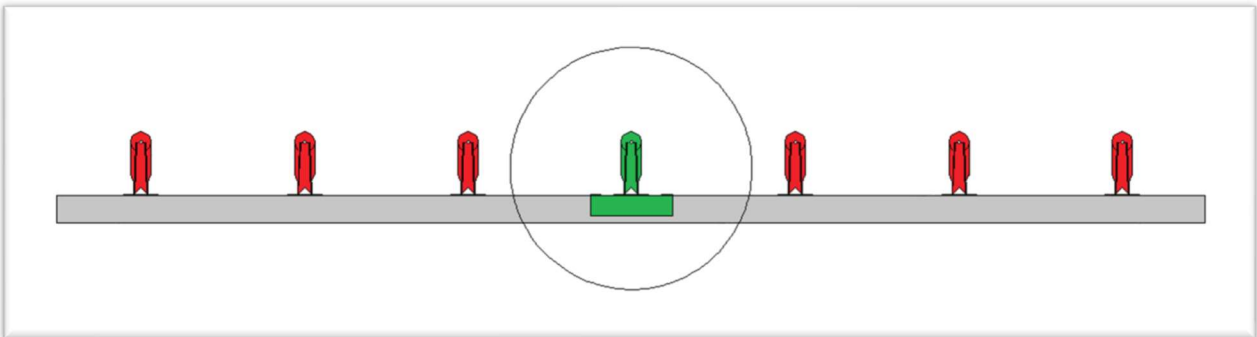
Prior to initial startup of the 1280 controller, the following must be completed:

- Mechanical installation of the scale carriage
- Alignment of the adjacent area idlers
- Mechanical installation of the speed sensor
- All wiring connections must be connected
- The conveyor will be required to run without material
- The maximum scale capacity should be determined
- Belt length and circuit time should be measured

6.1 Static Calibration

With the conveyor belt lifted off the weighing portion of the scale, perform the zero calibration as listed in section 4.2.

Following the zero calibration, perform the span calibration by applying a known test weight to the scale as listed in section 4.2.



Isolate all other weight from this portion of the scale and weigh idler.

6.2 Setup Variables

From the Setup Menu. Enter the Units of Measure, Belt Length, Belt Revolutions, Test Time, Weigh Idler Count, and Idler spacing as listed in section 5.11.

6.3 Belt Speed Calibration

With the conveyor belt running at maximum speed and no material on the belt. Perform the Belt Speed Calibration from the Calibration Menu as listed in section 5.21. The belt speed count number can be manually entered. The speed count is the accumulated pulses counted during the test time entered from the setup menu.

6.4 Tare Calibration

With the conveyor belt running and no material on the belt. Perform the Tare Calibration from the Calibration Menu as listed in section 5.21. The tare calibration value can be manually entered. The tare calibration value is the average weight of the empty belt applied to the scale carriage.

6.5 Span Calibration

6.5.1 Determining Span Calibration mode.

The 1280 belt scale controller can be calibrated using known material weight, applied calibration weights, a calibration test chain, or an internal electronic reference. Prior to performing a span calibration select the method of calibration by toggling through the available options using the mode button directly under the Span Calibrate button.

6.5.2 Span Calibration reference value.

The Weight value is determined by the known static weight as applied to the scale carriage. If using a calibration test chain, the Weight mode is also used. The value is the known lbs./ft. value of the calibration test chain multiplied by the idler spacing and the number of weigh idlers listed on the setup screen.

The Ecal value is determined by $1/4^{\text{th}}$ of the static scale capacity of Scale 1 from the configuration menu.

The Material value is determined by weighing a known sample of product that has passed over the scale. This value will be compared to the weight registered in the Reset Total.

6.5.3 Span Calibration

The Span value can be manually adjusted by directly entering the span number. The span number is directly proportional to the scale output. Adjusting the span number greater by 1% will increase the scale output by 1%. The span number cannot be 0.

If performing the span calibration with Ecal, the belt must be running empty.

If performing the span calibration with weights, the weights are applied to the scale carriage and the belt must be running empty.

If performing the span calibration with a calibration test chain, the chain is centered over the scale carriage and secured to remain in place while the conveyor belt is running.

If performing a material span calibration, the Reset Total is cleared. A known amount of material is passed over the conveyor. The known weight value is entered as the reference.

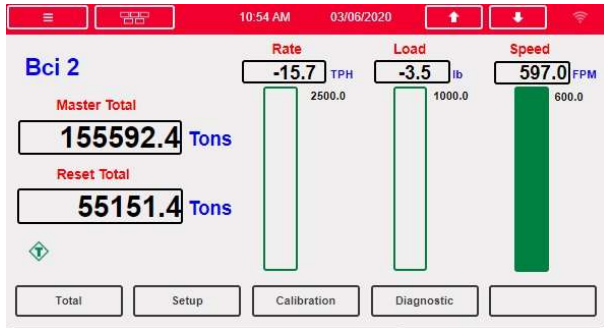
6.5.4 Completed Calibration

Upon the completion of a calibration, the Calibration Status will change to show the Percentage of Error and the As Found and As Left values.

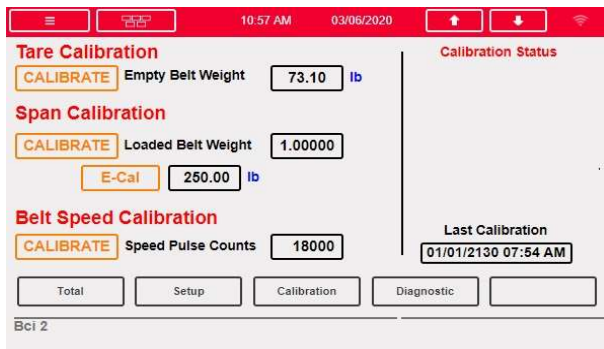
The value must be Accepted to save the change, if the change is not to be made, press Abort.

1280 Belt Scale Calibration Guide

With the belt running and no material on the belt.



Press



Under Tare Calibration

Press

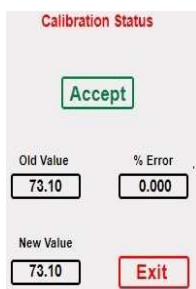


The Tare Calibration test will start, and continue for the duration set for the speed test.



To Abort the calibration, Press **Exit**

When Completed, the screen will show the Error.



To Exit and not change the calibration, Press **Exit**

To Change the Calibration, Press **Accept**

7.0 Ethernet and WIFI Setup

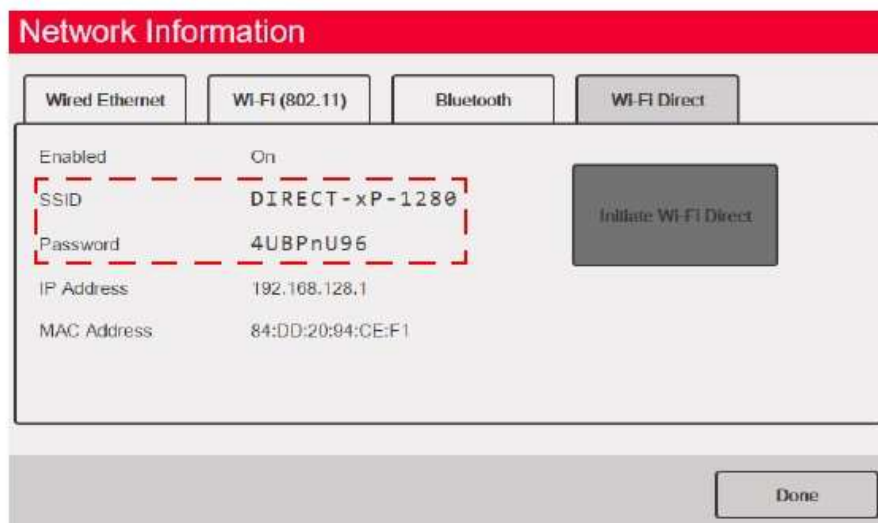


5 Network Settings

Wi-Fi Symbol - Faded symbol means there is not a Wi-Fi connection, bright symbol means there is a Wi-Fi connection. Press on the symbol to bring up the *Network Information Screen* which includes information on Wired Ethernet, Wi-Fi and Bluetooth®.

7.1 Using an Internet browser as a remote display

A virtual display can be viewed on a computer or mobile device using an Internet browser that supports HTML 5 and JavaScript. In addition to viewing, touchscreen elements can be activated by clicking on them in the browser window. To use this feature, the 1280 and remote device must be connected to the same network. In the browser's address bar (URL), type the 1280's IP address using TCP port 3000. WIFI Direct requires connecting to the 1280 stand alone network and machine generated password.



7.2 Ethernet

The **Ethernet** menu is used for the setup of wired and Wi-Fi Ethernet connections, including Wi-Fi Direct. These are used to connect the 1280 to local area networks (WLAN and LAN). Network information can be found in weigh mode by pressing the Wi-Fi symbol or in the **Ethernet** menu in Configuration Mode.

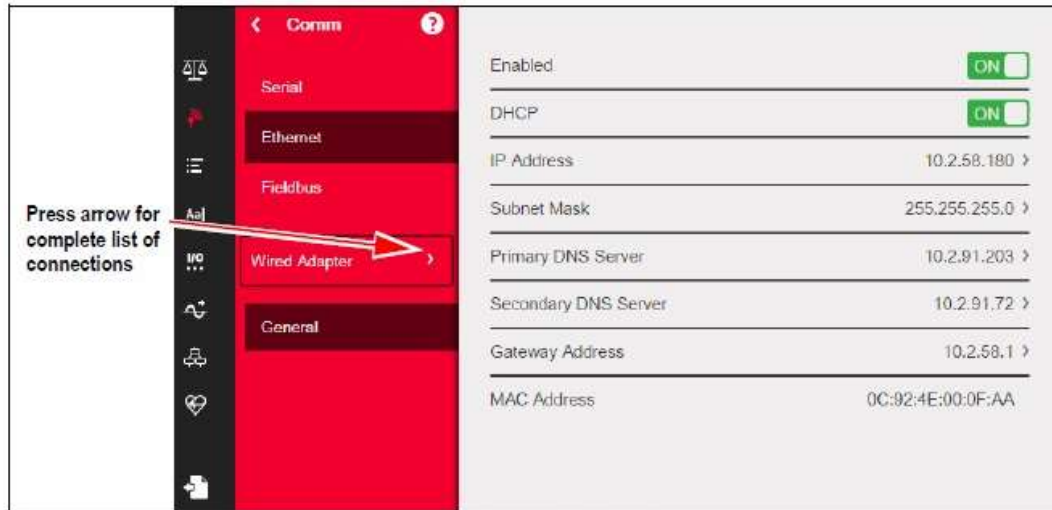



Figure 5-3. Ethernet Screen

1. Press .
2. Select **Ethernet**.
3. Press the selection field arrow to expand the Ethernet selections.
4. Select the desired Ethernet option (Table 5-4).
5. Set the parameters associated with the Ethernet type selected.

Parameter	Description
Wired Adapter	General wired Ethernet settings
Wi-Fi [®] Adapter	General Wi-Fi settings, Wi-Fi Direct
TCP Command Server	Specific settings for the TCP Command Server
Stream Server	Specific settings for the Stream Server
TCP Client 1	Specific settings for TCP Client #1
TCP Client 2	Specific settings for TCP Client #2

Table 5-4. Ethernet Selections

8.0 Installation and Setup 1280 Analog Output Card

Belt Scale specific settings:

Set Source to Scale 4 for Rate of Flow

Set Source to Scale 5 for Belt Speed

Scale Mode is NET




Error Action Full Scale

Minimum Tracked = 0

Maximum Tracked is Belt Scale Capacity for Rate of Flow or Maximum Belt Speed for Belt Speed.

As per the Rice Lake Instructions for part Number 165366 and 164686

Analog Output Configuration


1. Within **Weigh Mode**, press . **Main Menu** displays.
2. Press  to access the **Configuration** menu.
3. To configure the analog output card, select  to enter the **Analog Output** menu.
 - Set **Output Mode** to 0–10 V, 4–20 mA or 0–20 mA
 - Set **Source** for the scale used as the source for the analog output
 - Set **Scale Mode** to track either gross or net weight from the scale
 - Set **Error Action** to specify how the analog output responds to system error conditions
 - Set **Minimum Value Tracked** to lowest weight value to be tracked by the analog output (a negative value can be entered)
 - Set **Maximum Value Tracked** to highest weight value to be tracked by the analog output (a negative value can be entered)

Analog Output Calibration

1. Connect a multimeter to connector J1 on the analog output card:
 - For voltage output, connect voltmeter leads to pins 3 and 4
 - For current output, connect ammeter leads to pins 1 and 2



Note Access to the Configuration menu may be restricted. Refer to the 1280 Technical Manual for more information.

2. Press **Calibrate** to enter the calibration wizard.
3. Adjust **Minimum** calibration: check voltage or current reading on multimeter. Use the numeric keypad to adjust the zero value up or down. The minimum calibration occurs at 0.5 V for a 0–10 V output and at 1 mA for a 0–20 mA output.
4. Adjust **Maximum** calibration. Use the numeric keypad to enter the value to be tracked.
5. Press  to return to weigh mode. The analog output function tracks gross or net weight.
6. For dual-channel cards, repeat calibration steps for the second (J2) connector.



Connection to PLC Analog Input Module

If the PLC analog input uses a common ground (negative input of the analog card) and both PLC channels are connected to the same option card, there is cross talk and the values of the two inputs are merged.

Example: if one is inputting 6 mA and the other is inputting 12 mA the two merge and each looks like it is inputting 9 mA.

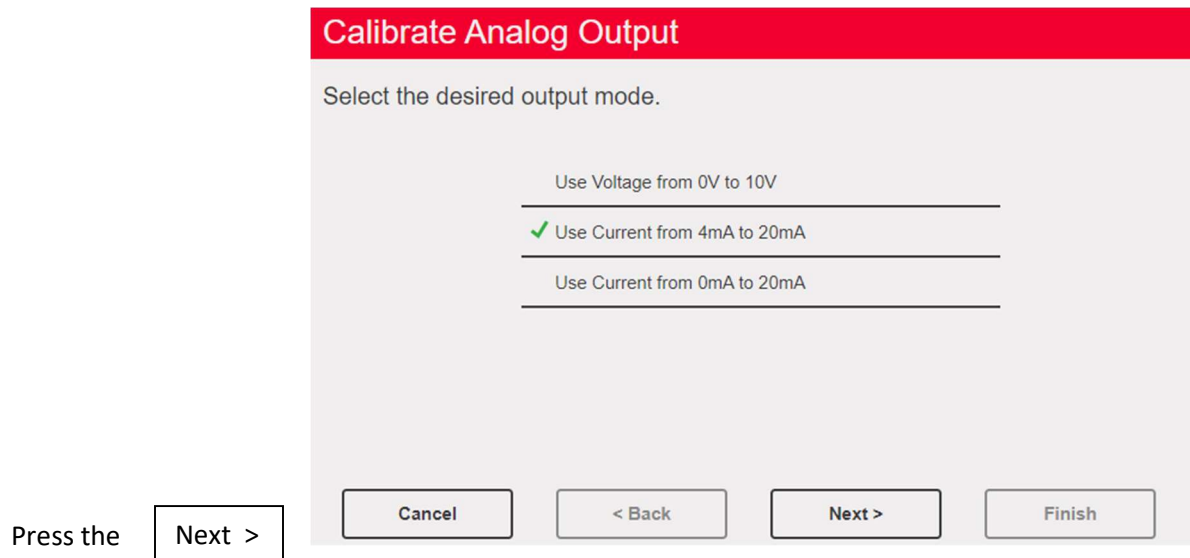
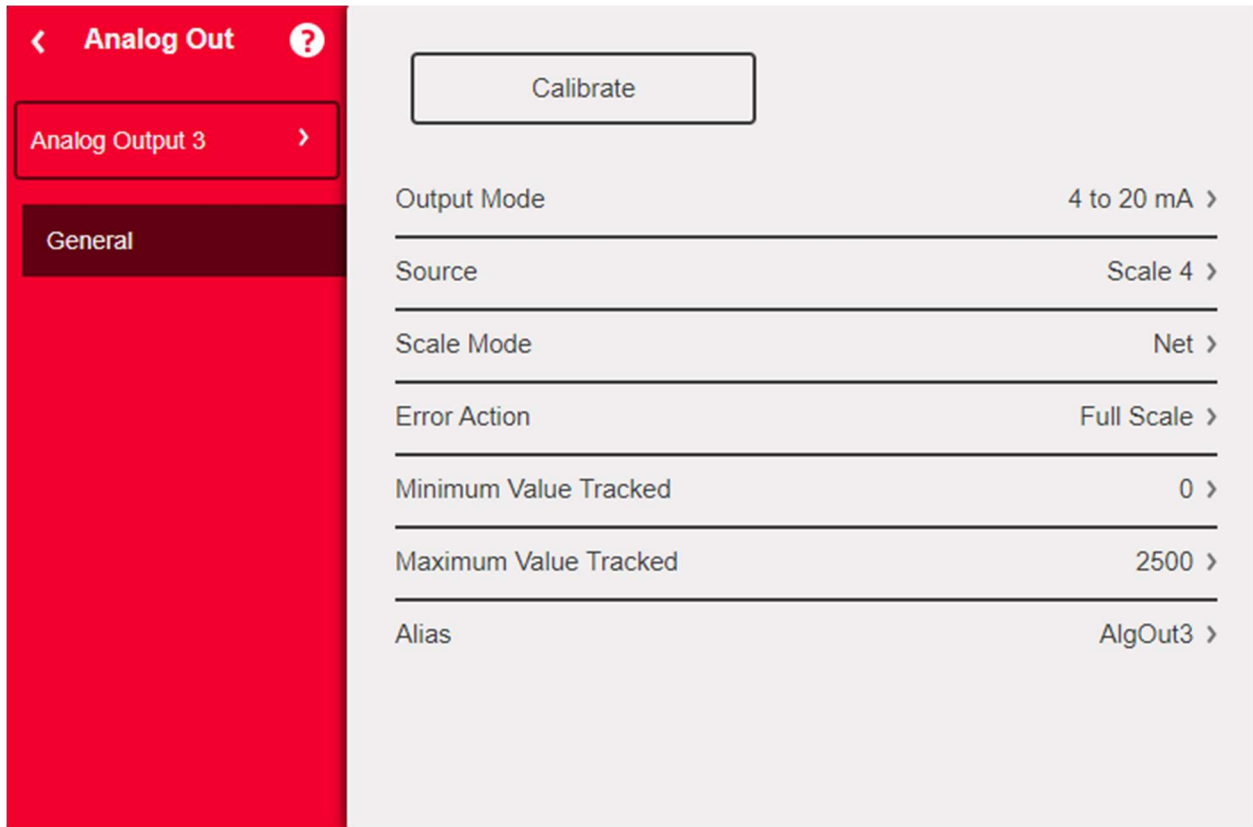
$$6 + 12 / 2 = 9 \text{ mA}$$

To prevent this cross talk, the PLC must have isolated grounds on the input channels.

After wiring the output, the calibration must be set.

As an example:

Press the



Press the

Calibrate Analog Output

Please enter the current (mA) reading and press Calibrate Minimum.

0 123...

Calibrate Minimum

Output set to minimum

Cancel < Back Next > Finish

Press 123...

Type in the measured Output signal. And press **Enter** in the center of the arrow keys.

This should be approximately 4.00 mA

Press Calibrate Minimum

The measured Output signal will change to exactly 4.00 mA

Press Next >

Press Set to Maximum

The Output Signal should change to Full Scale.

This should be approximately 20.00 mA

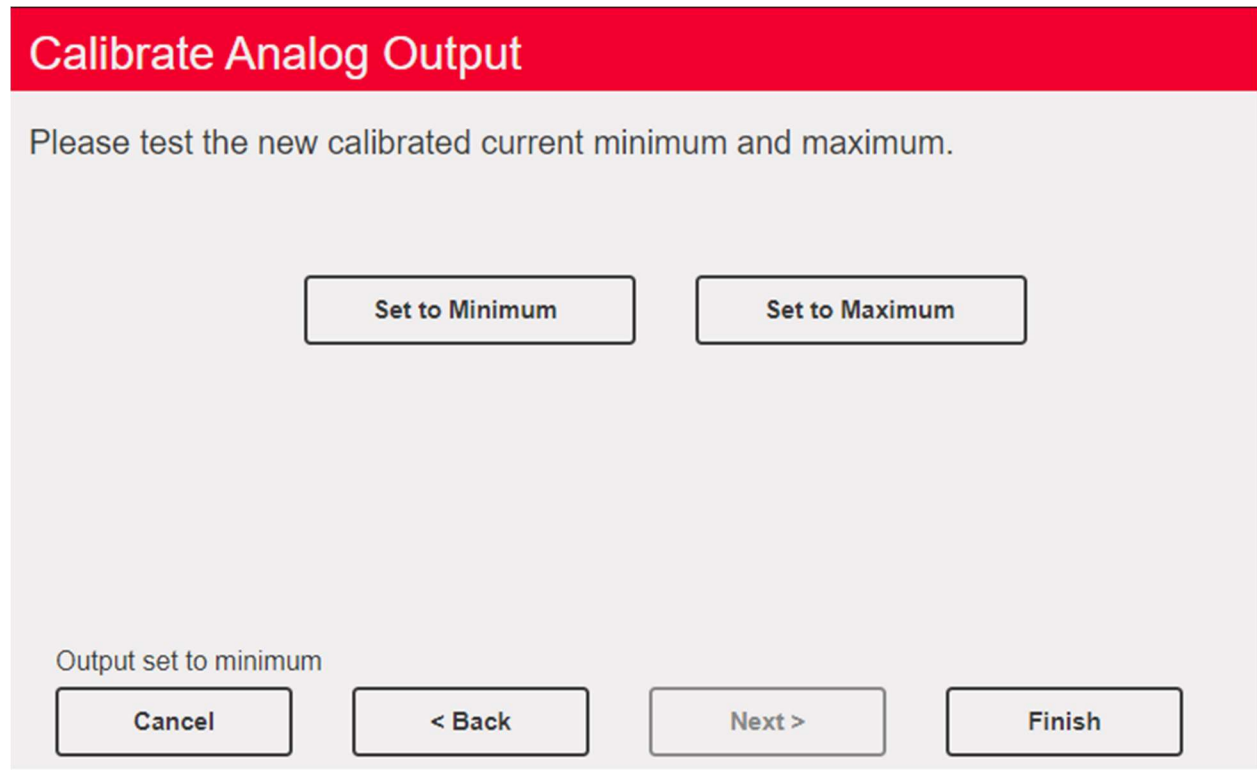
Press 123...

Type in the measured Output signal. And press **Enter** in the center of the arrow keys.

Press Calibrate Maximum

Press Next >

When Calibrated, the Output Signal can be toggled between Minimum and Maximum.



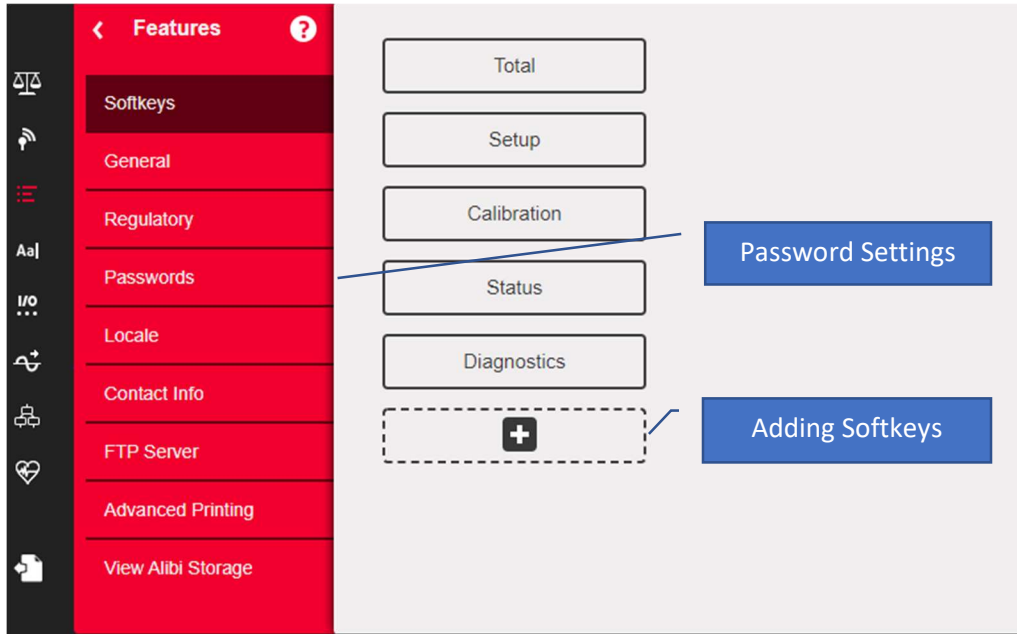
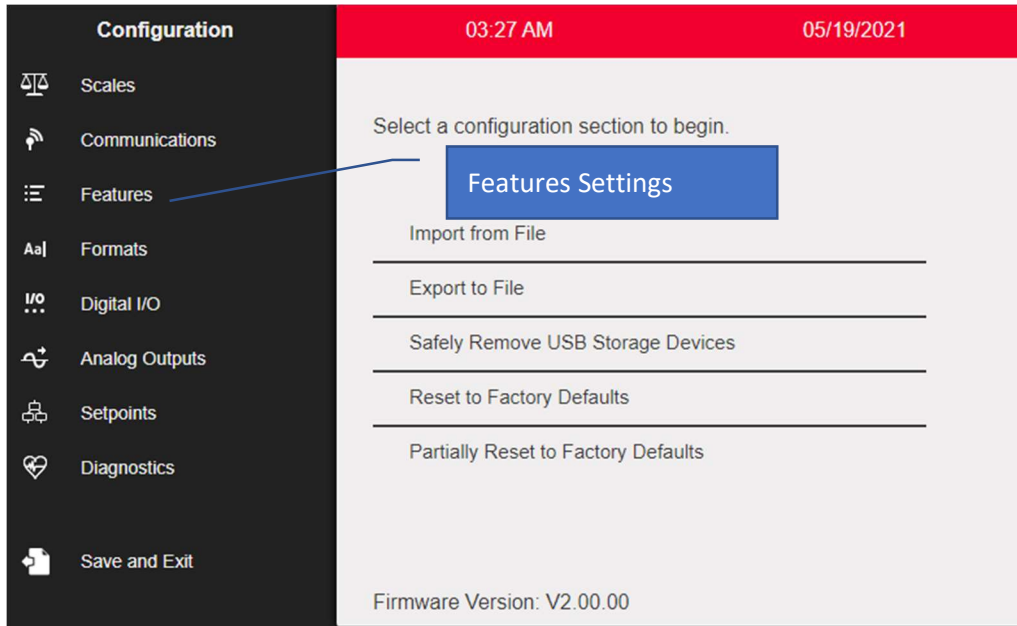
Press 

Press the Save and Exit, button in the lower Left of the Screen.



9.0 Protection of settings and Alternate displays

The menu softkeys are enabled or disabled to provide protection for setup and calibration parameters. From the Features menu accessed in the Configuration menu.



The sofkeys that are removed are hidden from manipulation.
The Diagnostic Softkey is used to check the iQube2 digital junction box.
Adding Softkey User Defined #5 adds a large format display.
Adding Softkey User Defined #7 adds a Master Total Reset.
The Configuration menu can be password protected.

10.0 PLC Communications

The PLC and 1280 use the fieldbus handler to extend the data set out to the PLC.

The fieldbus handler used in the BCI belt scale software overrides the built-in fieldbus data of 4 words input and 4 words of output normally used with the standard 1280. All commands used by the standard fieldbus will not work as the 1280 will take over all data going out and coming into the 1280.

The BCI program send out the following data every 250 ms. These values are floating-point 32-bit type.

Output #1 = Master Totalizer

Output #2 = Reset Totalizer

Output #3 = Rate

Output #4 = Load

Output#5 = Speed

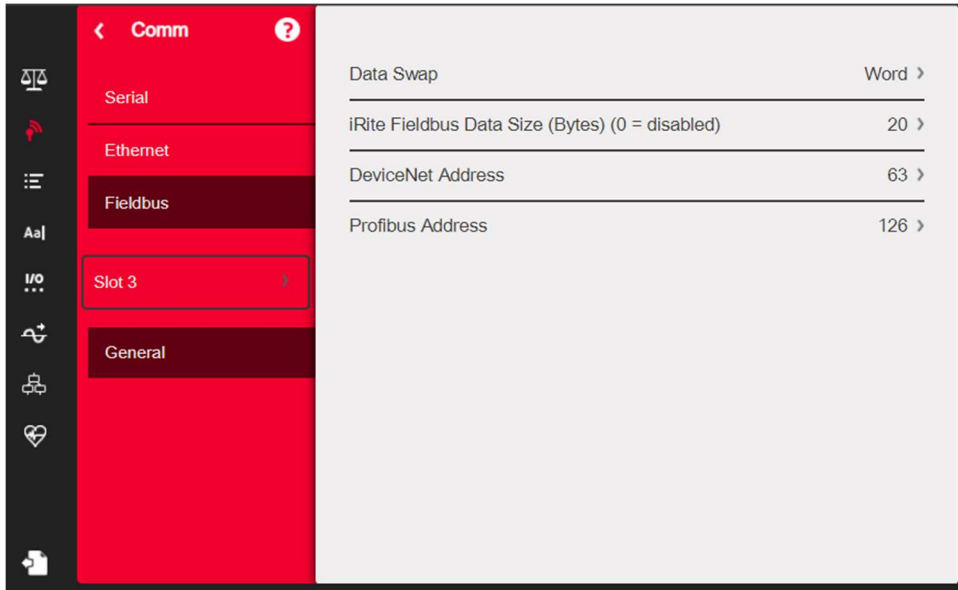
Input #1 = 1, from the PLC will clear the Reset Totalizer to 0.0.

Input #1 = 2, from the PLC will send a print command to the 1280.

10.1 1280 settings for PLC Communications

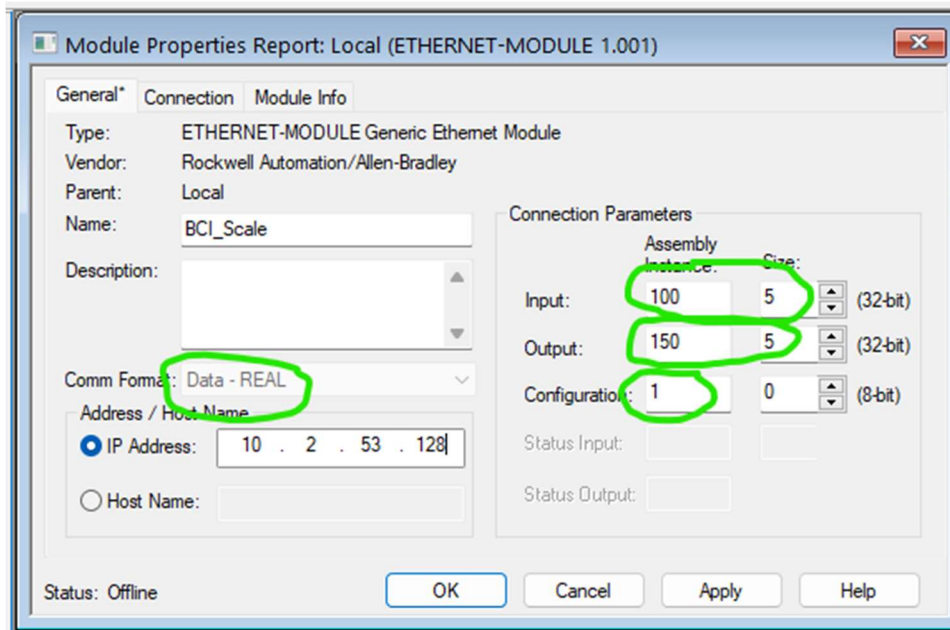
To setup the 1280 change the following setting in config. Under the Fieldbus setting. Make sure you select the correct slot number.

Change Data Swap to Word. Change iRite fieldbus Data size to 20.



10.2 PLC Communications settings

The Allen Bradley PLC is setup using a generic module with the following setting.



Once setup the PLC will create tags where the input and output values can be use.

The input values described above will appear in the following input values starting with BCI_Scale:I.Data[0]

BCI_Scale:I	{...}	{...}		AB:ETHERNET
BCI_Scale:I.Data	{...}	{...}	Float	REAL[5]
BCI_Scale:I.Data[0]	0.0		Float	REAL
BCI_Scale:I.Data[1]	0.0		Float	REAL
BCI_Scale:I.Data[2]	0.0		Float	REAL
BCI_Scale:I.Data[3]	0.0		Float	REAL
BCI_Scale:I.Data[4]	0.0		Float	REAL

BCI_Scale:I.Data[0] = Master Totalizer

BCI_Scale:I.Data[1] = Reset Totalizer

BCI_Scale:I.Data[2] = Rate

BCI_Scale:I.Data[3] = Load

BCI_Scale:I.Data[4] = Speed

To perform a reset or print use the following output value.

BCI_Scale:O	{...}	{...}		AB:ETH
BCI_Scale:O.Data	{...}	{...}	Float	REAL[5]
BCI_Scale:O.Data[0]	0.0		Float	REAL
BCI_Scale:O.Data[1]	0.0		Float	REAL
BCI_Scale:O.Data[2]	0.0		Float	REAL
BCI_Scale:O.Data[3]	0.0		Float	REAL
BCI_Scale:O.Data[4]	0.0		Float	REAL

BCI_Scale:I.Data[0] = 1 to Reset totalizer

BCI_Scale:I.Data[0] = 2 to Print.