APX

PROGRAMMABLE INDICATOR

INSTALLATION & TECHNICAL MANUAL

PRELIMINARY

WESTERN SCALE CO. LTD.

APX INDICATOR
INSTALLATION & TECHNICAL MANUAL (PRELIMINARY)

SOFTWARE RELEASE: PRELIMINARY, 09/2016

**FOR TECHNICAL SUPPORT REGARDING THIS PRODUCT, PLEASE CALL
YOUR AUTHORIZED WESTERN DEALER:**

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INTRODUCTION

The APX programmable indicator is the pinnacle of accuracy and process control, delivering the highest level of performance for all weighing applications. Up to 4 weighing channels may be utilized and the modular design allows incredible connectivity options and integration with virtually any system. The technician-friendly design, full numeric keypad, navigation keys and 5.6 inch color display make the APX easy to install, configure and calibrate.

Western's continued dedication to durability, functionality, and versatility make the APX *engineered for the diversity of the weighing industry.*

The following User information is for the exclusive use of **WESTERN** Dealers and Customers.

Safety

Installation, configuration, and servicing are only to be done by qualified Scale Service Technicians as authorized by Western.

Power must be disconnected before servicing the unit. Disconnection from the line voltage is done by disconnecting the mains plug.

This equipment must be connected to a socket-outlet with a protective earthing connection. The socket outlet shall be installed near the equipment, and shall be easily accessible.

This equipment is intended for connection to multiple RATED VOLTAGES or FREQUENCIES. The switchover to the corresponding voltage is done automatically by the equipment.

CAUTION! HIGH VOLTAGES are present inside the APX indicator enclosure.

Scale Service Technicians handling APX PCBs must observe proper electrostatic discharge (ESD) handling procedures.

ATTENTION! Unauthorized installation and service of this unit may void the warranty.

Features

- Ultra-fast ARM Cortex Processor
- Full Color! Graphic display shows multiple scales and real-time application progress.
- Configurable scale display layout with variable sized digits
- 5 programmable function keys
- Full keypad calibration to any test weight amount.
- Modular design for easy service & upgrading
- Huge memory for Truck Databases & more.
- Removable SD card memory
- Password & Category 1 Audit Trail

- Custom Weigh Ticket Editor
- Programmable communication outputs
- Time & Date
- International Symbols and options
- Standard 304 stainless steel enclosure with swivel bracket
- Easy to navigate software menus
- Calibrate to any test weight value
- Terminal wiring
- Time & Date
- 2 Year Warranty
- *Made in Canada*

Specifications

SCALE INTERFACE
- Up to 4 Scale Channels (Multi A/D)

EXCITATION
- 7.5 VDC. Up to 16 350 Ω or 32 700 Ω load cells

RESOLUTION
- 1,000,000 internal A/D counts
- Up to 100,000 displayed divisions
- 10,000 divisions LFT (Class III/IIIL)
- 20,000 divisions LFT (Class IIIHD)

MEASUREMENT RATE
- 100 weight samples/second

ANALOG SIGNAL SENSITIVITY
- .3µV

SYSTEM LINEARITY
- 0.01% of Full Scale

RFI PROTECTION
- Filtered Excitation, Signal, and Sense lines

COMMUNICATIONS
- 2 fully configurable, full duplex RS-232 serial ports.
- 1 fully configurable, full duplex RS-RS-422 serial port.
- USB port (USB-A host) for external memory, keyboard, etc.
- Ethernet port (TCP/IP, 10/100 Base T)
- Wireless RF Module (Optional)
- PLC Interface Modules (Pending)

OTHER I/O – COMING SOON
- 6 bi-directional I/O ports supporting industry standard OPTO22 boards (Pending)
- Additional 24 I/O with optional expansion rack (Pending)
- 4-20mA, 0-10V Analog Outputs (Pending)
- More connectivity options!

POWER REQUIREMENTS
- 100-240 VAC 50/60 Hz 1A
- Consumption: Avg 240 W (max)

KEYPAD
- Membrane keypad: 27 numeric, scale function, navigation & program keys.

DISPLAY
- TFT LCD color graphic display
- Size: 4.6" x 3.2" (320 x 240 pixels)

OPERATING TEMPERATURE
- 14°F to 104°F (-10°C to 40°C)

APPROVALS
- NTEP Class III/IIIL (10,000d): 15-086
- Measurement Canada Class III (10000) / IIIHD (20000): AM-5992

WARRANTY
- 2 year standard warranty

DISPLAY & ANNUNCIATORS

The APX uses a large, full-color, Liquid Crystal (LCD) display with a 320 x 240 pixel resolution. Up to 5 weight displays (4 scales and total) may be shown at once with each display communicating full scale data and status to the user.

Single Scale Display
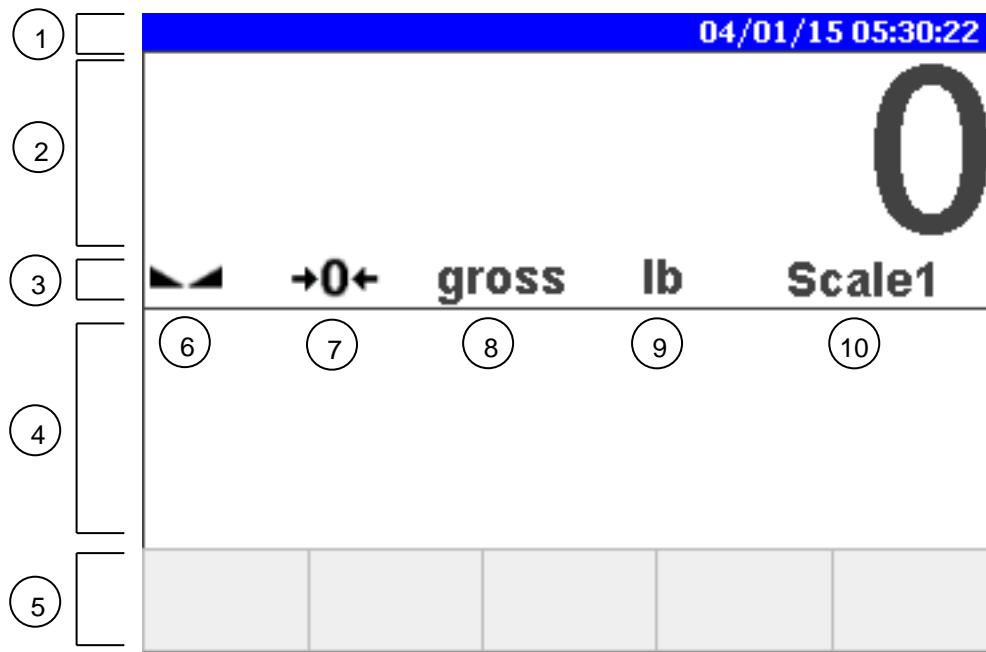
1. Information Bar	6. Stable/Motion Annunciator
2. Weight Display	7. Centre of Zero Annunciator
3. Annunciator Bar	8. Gross/Net Annunciator
4. Application Display	9. Units Annunciator
5. Function Key Bar	10. Scale Name (Red = Selected)

Weight Display

- 6 digits. Up to 4 decimal points.
- Negative weights are indicated by a minus sign (-).

Annunciators

STABLE: The scale weight is **STABLE**. Weight readings are not fluctuating (in motion).

MOTION: The scale weight is in **MOTION**. Weight readings are not stable.

→0← **CENTRE ZERO:** The scale is within **±0.2** graduations of TRUE ZERO.

gross **GROSS:** The scale is in **GROSS** weighing mode.

net **NET:** The scale in **NET** weighing mode (a tare weight is stored).

lb **lb:** The scale is weighing in **POUNDS**.

kg **kg:** The scale is weighing in **KILOGRAMS**.

oz **oz:** The scale is weighing in **OUNCES**.

g **g:** The scale is weighing in **GRAMS**.

Multi-Scale Display

When multiple scales are enabled, each weight display contains its own annunciator bar. Weight Displays are sized automatically unless otherwise specified in Configuration & Calibration Mode.

2 Scales

4 Scales

Multi-Scale TOTAL Display

When scale summing or Total Mode is used, a weight display is created showing the sum of all the enabled scale channels. The summed weight display may be shown on its own or grouped with the individual scale channels connected.

In Summing (Total) Mode:

- All scale channels accept keypad commands (scale functions) simultaneously, including:
    - Zero
    - Tare
    - Gross/Net toggle
    - Units toggle

- Tares will only be accepted if all scales are in a tare accepting condition. For more information on these conditions, see page 10.

- Operator entered keypad tares are applied to the sum weight only.

KEYPAD & SCALE FUNCTIONS

The APX indicator's primary operator interface is the keypad. Keys are used to access scale functions, navigate menus, access program functions, and more…
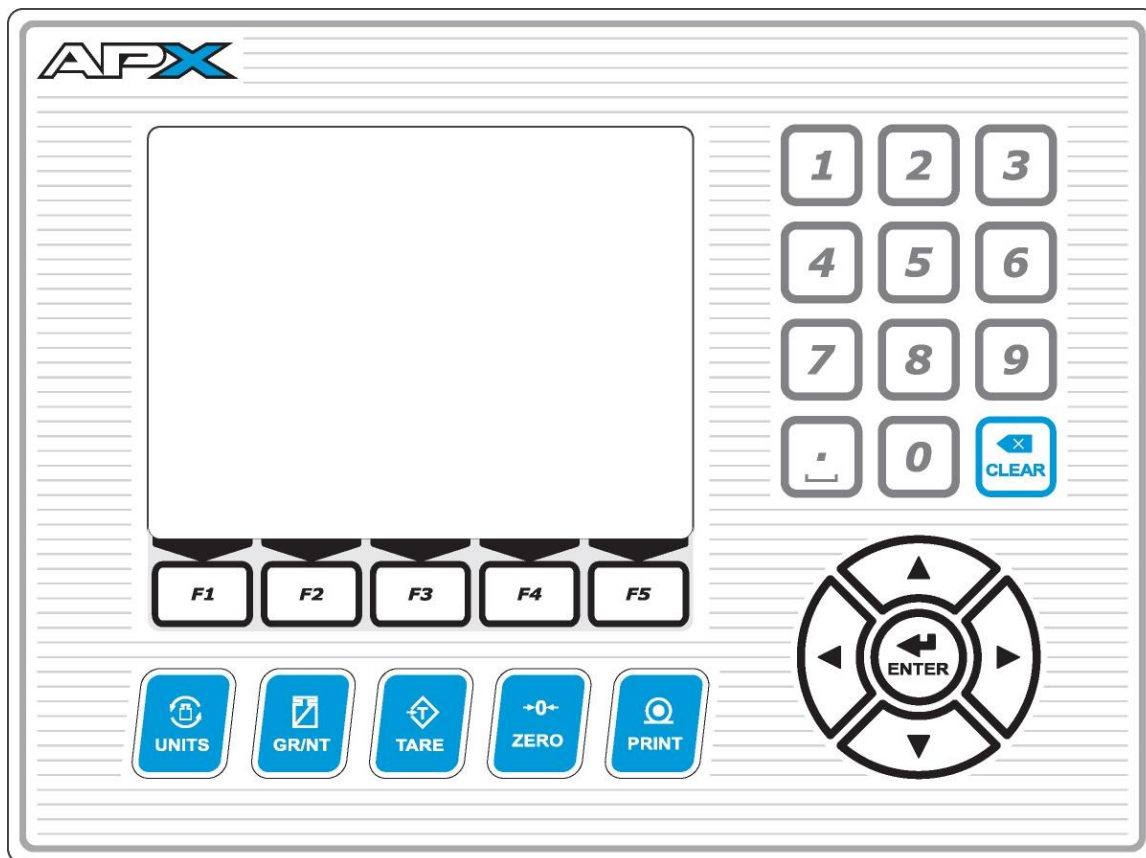
APX Keypad

Scale Keys / Standard Scale Functions

UNITS: Toggles between Primary and Secondary Weighing Units (if enabled).

Alternate Units may be selected or disabled in Calibration Mode by Qualified Technicians.

GR/NT: **GR/NT** - Toggles between GROSS and NET weighing modes if a tare value is stored.

Scale Keys / Standard Scale Functions… (Cont.)

TARE: Acquires a tare value from weight on the scale (Container, Box, etc.).

The indicator will not tare if:

- Scale weight is in MOTION
- Scale weight is zero, negative or over capacity

An error message is briefly displayed when one of these tare errors occurs.

> *The TARE button may be disabled in Calibration Mode by Qualified Technicians.*

> *In Canadian Legal for Trade applications, previous tare weights must be cleared before a new tare weight can be acquired.*
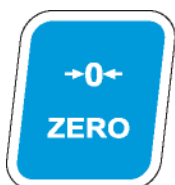
ZERO: Sets the weight display to ZERO.

The indicator will not zero if:

- Scale weight exceeds allowed ZERO RANGE
- Scale weight is in MOTION or over capacity

An error message is briefly displayed when one of these zero errors occurs.

PRINT: Transmits a scale ticket or data string.

CLEAR: Erases any previously acquired tare values.

Secondary Function (Text entry fields):
Moves the cursor back, erasing entered text.

Navigation Keys

The **ENTER** key is used to execute various commands

The Navigation or **ARROW** keys are used primarily for accessing parameters in Configuration & Calibration Mode and cursor control in Application Programs.
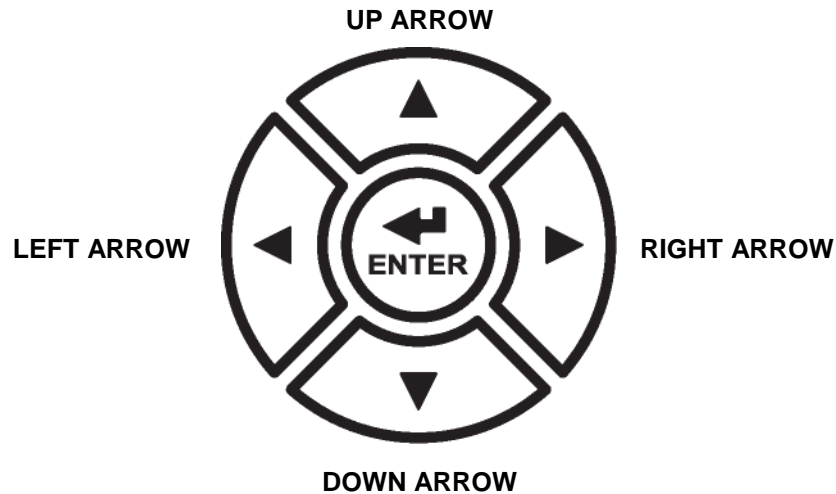
Function Keys

The Function Keys are programmable "soft keys" primarily used in Application Programs and for performing functions in Configuration & Calibration Mode.

Each key (F1 to F5) corresponds to a Function Key Bar cell on the screen. If the key is enabled, its function appears here.
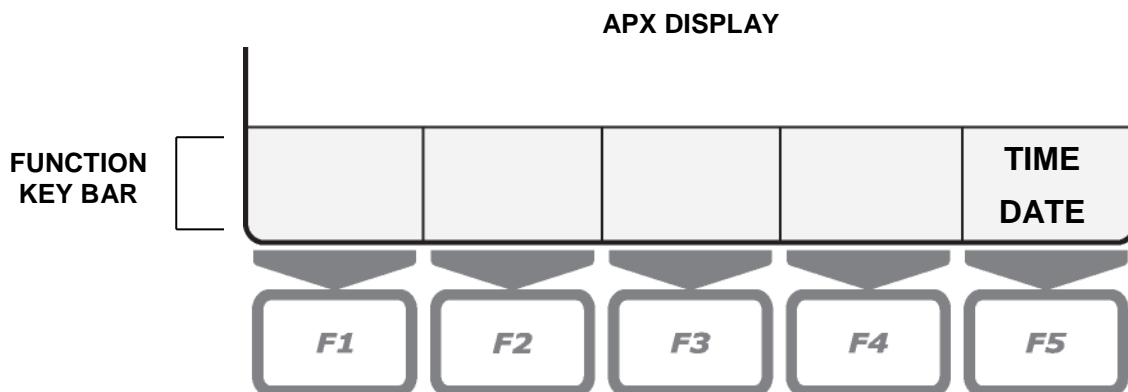
Example:

The diagram above shows the **F5** key programmed to perform a "Time/Date" function. The other function keys are not enabled.

Multi-Scale Option Functions

APX indicators with the multi-scale option may utilize up to 4 independent scale channels and a scale summing display.

To view the weight display for the desired channel, press the corresponding scale channel number key (1, 2, 3, 4 or 5 for Total Mode) on the **numeric keypad** followed by the **ENTER** key.

The Scale Name of the selected scale channel will turn **RED**.

1 → ENTER →	**1256** gross lb **Scale1**
2 → ENTER →	**1802** gross lb **Scale2**
3 → ENTER →	**1103** gross lb **Scale3**
4 → ENTER →	**5761** gross lb **Scale4**
5 → ENTER →	**9922** gross lb **SUM**
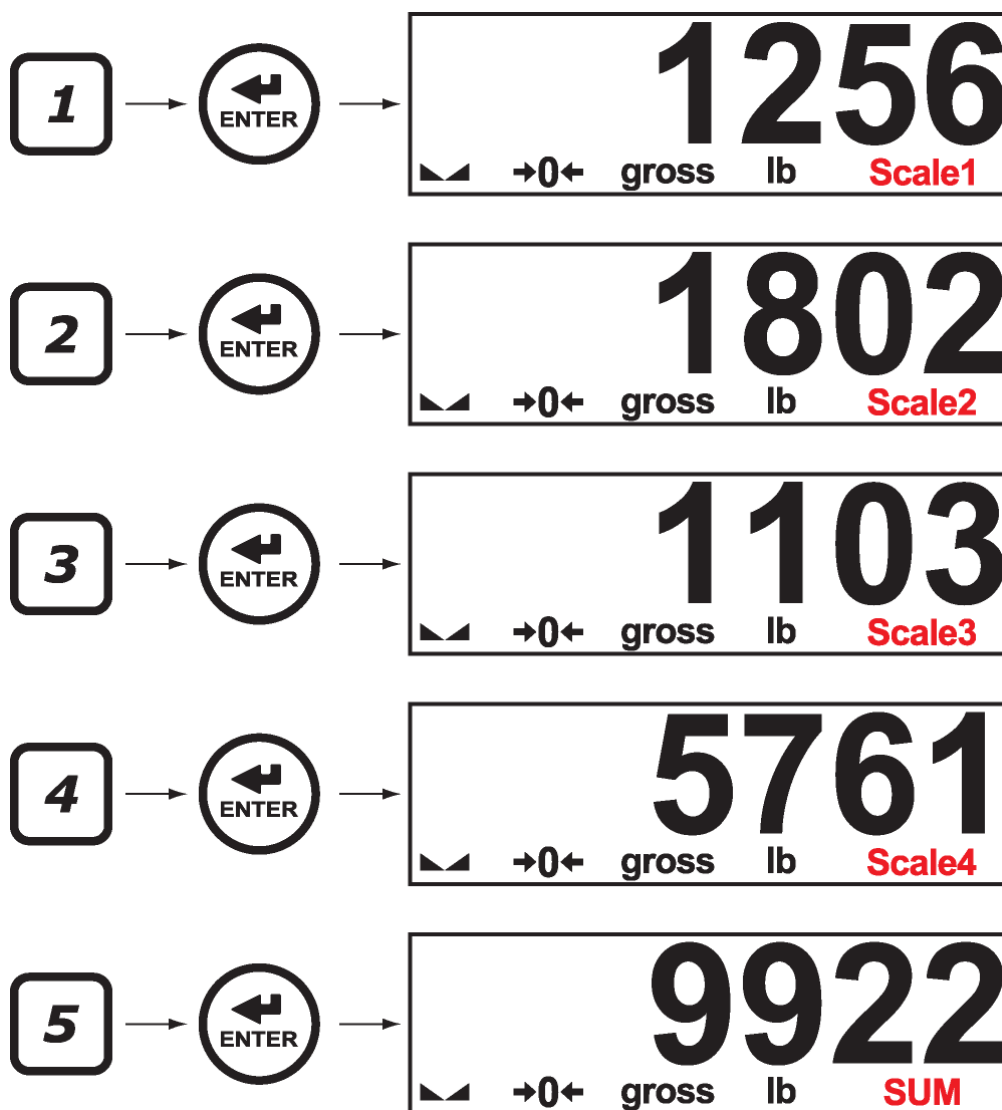
> *Scale Channels 2, 3, 4 and Total Mode (scale summing) must be enabled in Calibration Mode by Qualified Technicians.*

INSTALLATION

Pre-Installation

It is always good practice to verify that your Western APX indicator is complete and undamaged upon receipt.

- Check over packaging for any signs of damage.

- Remove APX from protective packaging and check for damage.

- Verify that the box includes the APX indicator complete with:
    - User Manual;
    - Mounting bracket and thumb screws.

Opening the APX Enclosure

1. Make sure the unit is disconnected from power.

2. Remove the screws from the back of the enclosure.

3. Lift the back cover away from the enclosure.
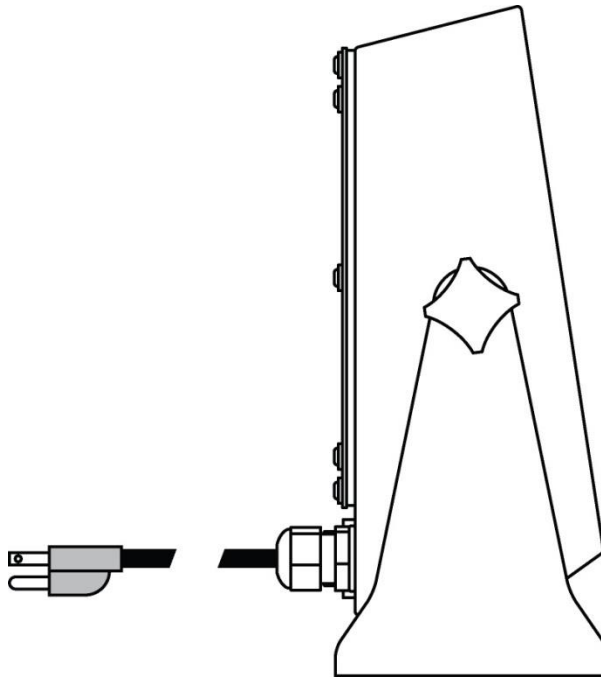
CAUTION! HIGH VOLTAGE! Only trained personnel should access any internal wiring and/or components.

Observe proper electrostatic discharge (ESD) procedures (wrist strap, etc.) when working with the APX enclosure open.

APX Components & Terminals
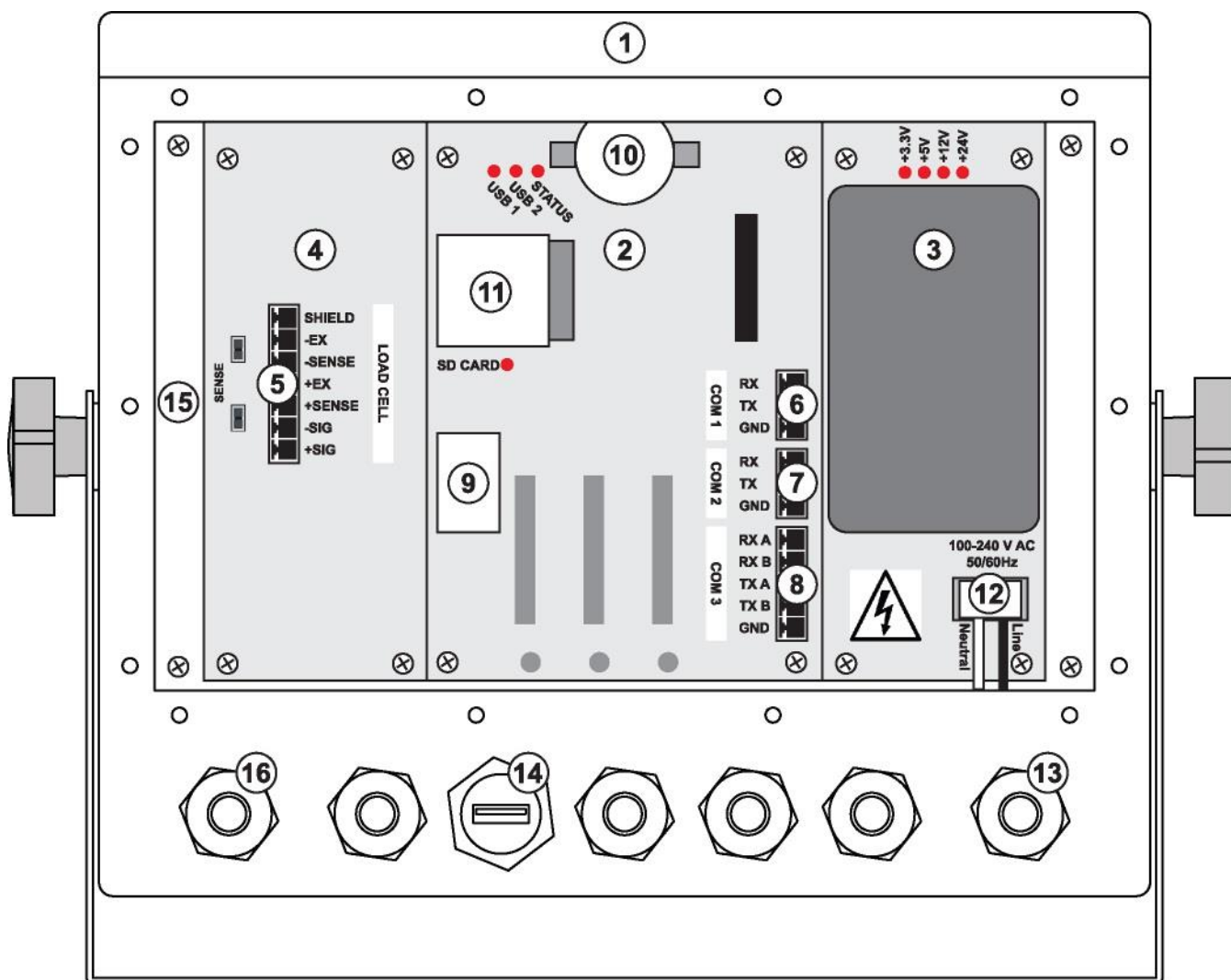
1	APX Main Enclosure	**9**	Ethernet Port (TCP/IP)
2	Processor PCB	**10**	Battery
3	Power Supply PCB	**11**	SD Card Connector
4	1 Channel A/D PCB	**12**	Power Terminal – **High Voltage!**
5	Scale / Load Cell Terminal	**13**	Power Cord Strain-relief
6	COM 1 Terminal (RS 232)	**14**	USB Port (USB-A)
7	COM 2 Terminal (RS 232)	**15**	Removable Mounting Pan
8	COM 3 Terminal (RS 232)	**16**	Scale Strain-relief (recommended)

NOTE: *Remove pan to access keypad connector (opposite side) of the Processor PCB.*

Strain-Reliefs & Cabling

The APX cord grip strain-reliefs feature a cable gasket with a sealed watertight membrane to prevent solids and liquids from entering the enclosure even when not in use.

1. Punch out or pierce the watertight membrane over the cable hole. The seal may be punctured with a screwdriver or the cable itself.

2. Loosen the dome-nut.

3. Run the cable through the hole and cable gasket, into the APX enclosure.

4. Tighten the dome-nut. The dome-nut uses a ratcheting action to close the gasket around the cable to provide a watertight seal.

5. Do not punch out the membranes of unused strain-reliefs. If a strain-relief is punched out but not used, install a plug to re-seal the unit.

WATERTIGHT MEMBRANE OVER CABLE HOLE
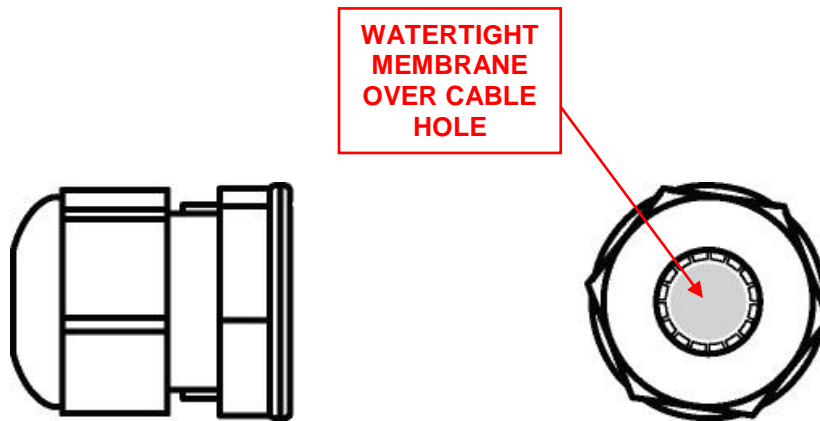
Strain-Relief (side & Head-on views)

Load Cell Wiring

1. Ensure the unit is not plugged in or powered on.

2. Run the cable from the load cell or junction box through the strain-relief. Select a strain-relief on the opposite side from the AC power cable.

3. Remove the connector from the Load Cell Terminal and wire according to the table below:

LOAD CELL TERMINAL	LOAD CELL WIRE
SHIELD	Shield Wire
-EX	Negative Excitation
-SENSE	Negative Sense
+EX	Positive Excitation
+SENSE	Positive Sense
-SIG	Negative Signal
+SIG	Positive Signal

4. Re-connect the connector to the Load Cell Terminal, tighten the strain-relief and repeat for other scale channels (if applicable).

Load Cell Terminal
Block & Connector
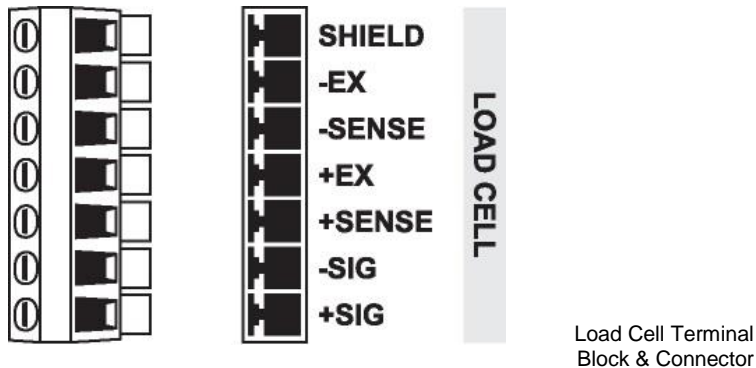
Load Cell Jumpers

4 or 6 wire load cells may be connected to the APX. When using 4 wire load cells (No SENSE wires), the SENSE jumper pins must be jumpered. For 6 wire load cells, remove the jumpers. See illustration below:

Jumpers should be removed but may be kept on 1 pin for safe-keeping.

4 wire load cell – Jumpers ON   6 wire load cell – Jumpers OFF
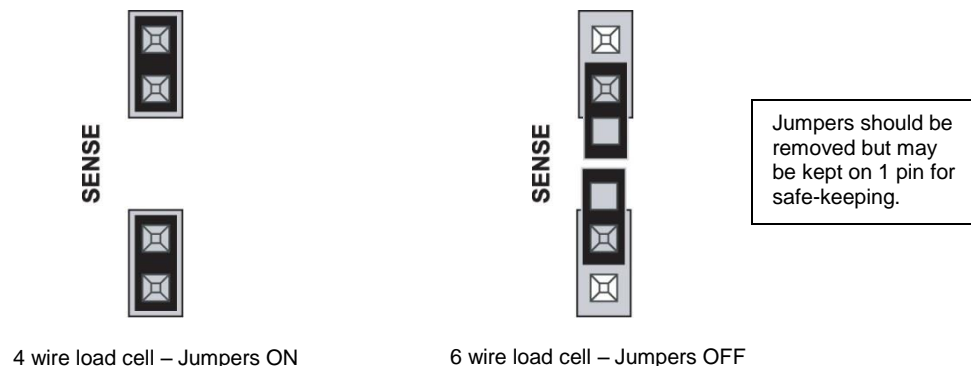
RS 232 Communications Wiring

The APX features 2 RS-232 serial ports (Com1 & Com2) on the Processor PCB to connect peripheral devices such as printers, remote displays and PCs.

1. Ensure the APX and communicating device (printer, etc.) are disconnected from power.

2. Run communication cable through the strain-relief

3. Remove the connector from the Com1 or Com2 Terminal as required and wire according to the table below:
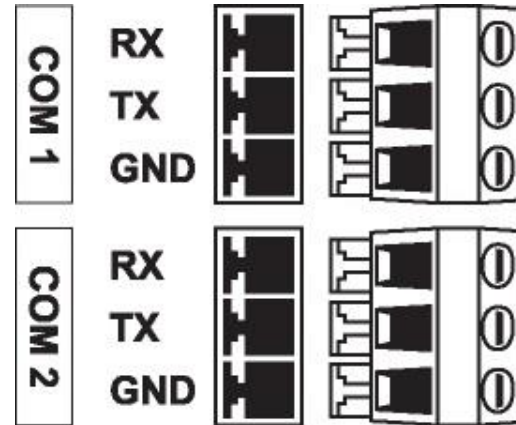
Com Port 1 & 2 Terminal Blocks

COM TERMINAL (COM1)	COMMUNICATING DEVICE
RX-1	TX
TX-1	RX
COM	SIG GND, or COM

COM TERMINAL (COM2)	COMMUNICATING DEVICE
RX-2	TX
TX-2	RX
COM	SIG GND, or COM
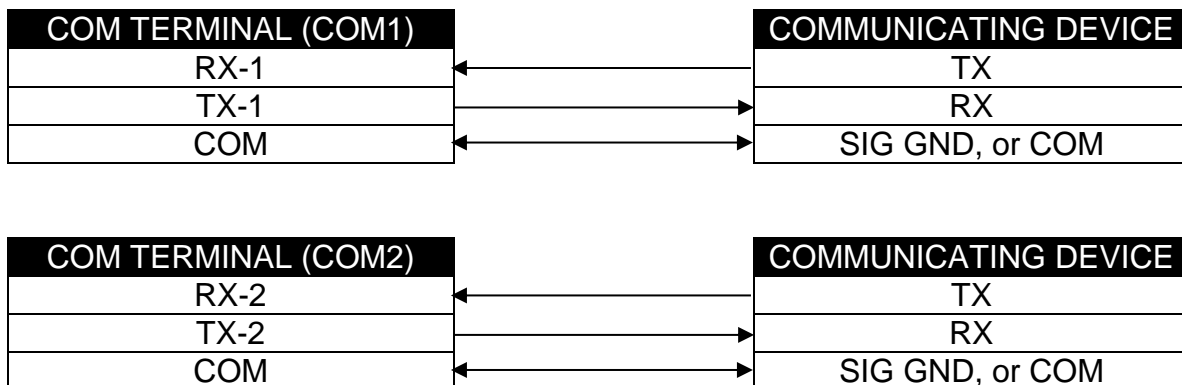
Default Communications Settings (Com1 & Com2):

- **9600 Baud**
- **No Parity**
- **8 Data Bits**
- **1 Stop Bit**
- **No Hardware Handshaking**
- **Continuous Transmit (Western DF1500)**

Qualified Technicians can adjust communications settings in Configuration & Calibration Mode (Communications, page 43).

RS 422 Communications Wiring

The APX features 1 RS-422 serial port (Com 3) on the Processor PCB to connect peripheral devices such as printers, remote displays and PCs.

1. Ensure the APX and communicating device (printer, etc.) are disconnected from power.

2. Run communication cable through the strain-relief

3. Remove the connector from the Com 3 Terminal as required and wire according to the table below:
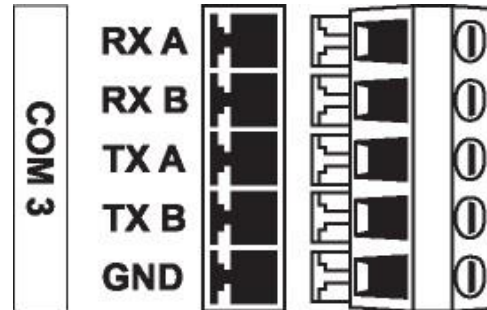
Com Port 3 Terminal Block

Qualified Technicians can adjust communications settings in Configuration & Calibration Mode (Communications, page 43).

Ethernet Wiring

The APX features 1 Ethernet TCP/IP port on the Processor PCB with an internal RJ45 jack for connecting to networks, PCs and PLCs.

A regular "**straight**" Ethernet patch cable is required when connecting to a network through a modem, switch or router.

A "**crossover**" Ethernet cable may be required If connecting directly to a PC or PLC. This will depend on the hardware and whether or not it has auto-sensing capabilities.

Ethernet Port RJ45 Jack

Qualified Technicians can adjust network settings in Configuration & Calibration Mode (Network, page 46).

Closing the APX Enclosure

1. Once wiring is completed, replace the back cover over the main enclosure.

2. Re-install the back cover screws being careful not to over-tighten.

3. Observe the back cover gasket is providing a good seal.
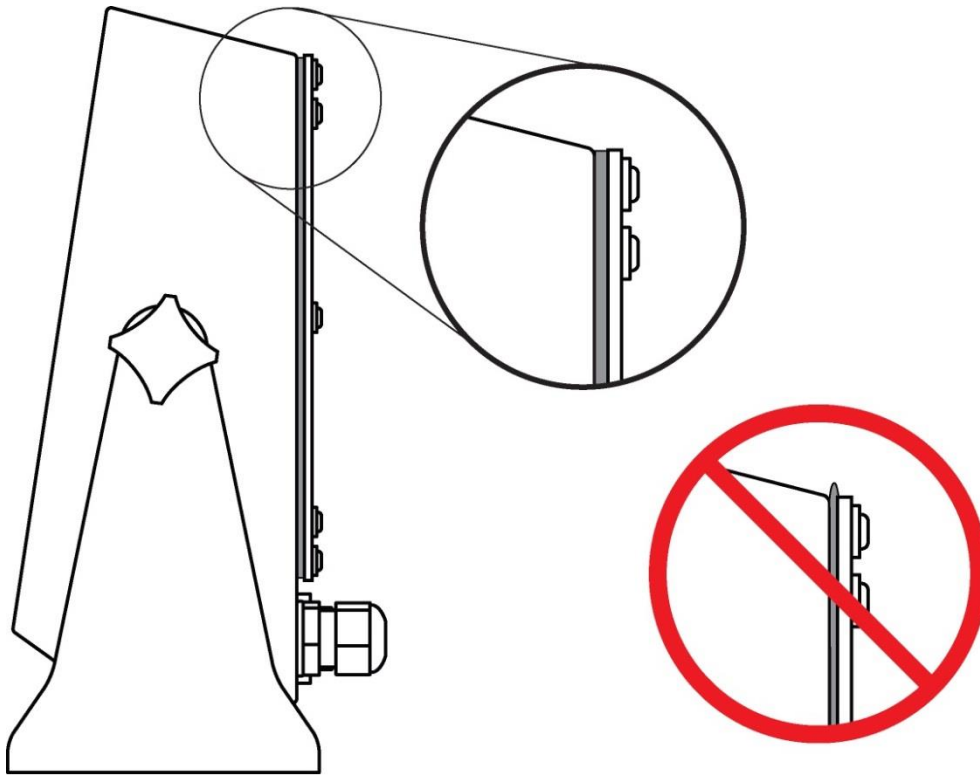
> ⚠ *Warning! Over-tightened screws may compress and deform the back cover gasket, resulting in gasket failure.*

Mounting Instructions

1. The APX can be mounted to horizontal or vertical surfaces using the mounting bracket.

2. Ensure that mounting structures (walls, posts, etc.) will bear the weight of the indicator (Approx. 3.2 kg / 7 lb).

3. Use proper hardware, including wall anchors where necessary, when mounting the bracket and indicator.

CONFIGURATION & CALIBRATION MODE

Entering Configuration & Calibration Mode

Press and hold the **LEFT** and **RIGHT ARROW** keys simultaneously. The **LOGIN** screen will be displayed.
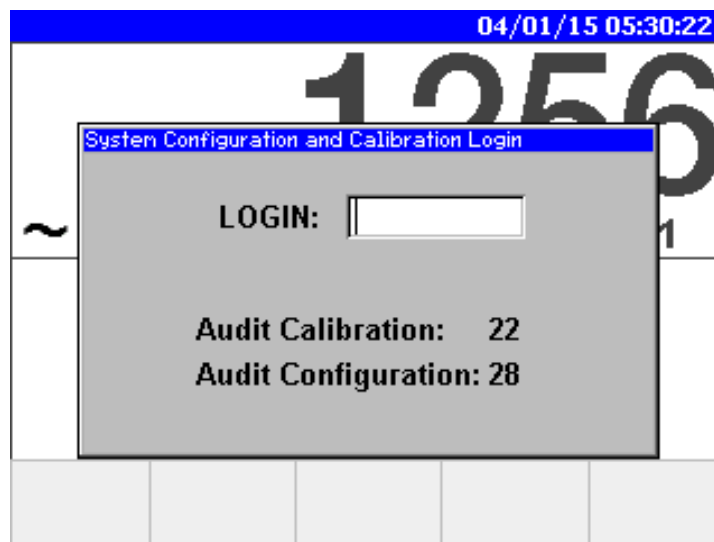
The login screen displays the Audit Trail counter values for Calibration and Configuration for metrological sealing of the device.

Key in the numeric password followed by the **ENTER** key. The factory default password is **"1111"**. The password may be changed in Configuration & Calibration Mode.
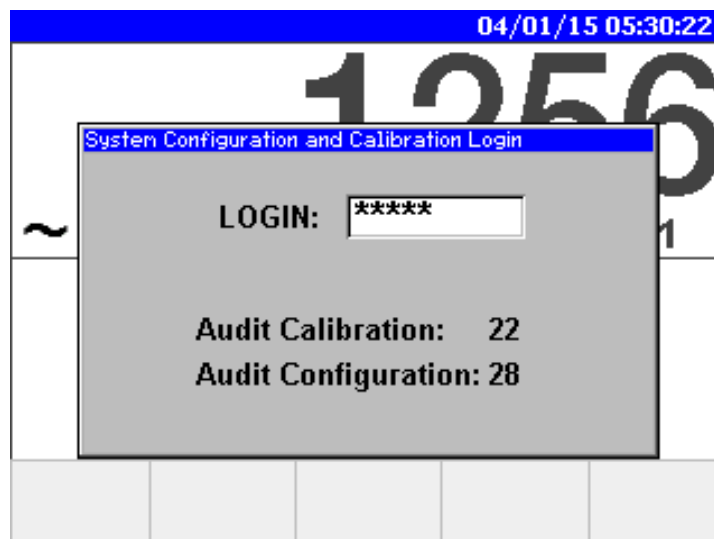
Navigating Configuration & Calibration Mode

Once the correct password is entered, the Configuration & Calibration window will be displayed (see below). System parameter groupings are organized into a menu folder tree.

Use the **UP** & **DOWN ARROW** keys to select a menu folder (highlighted blue).
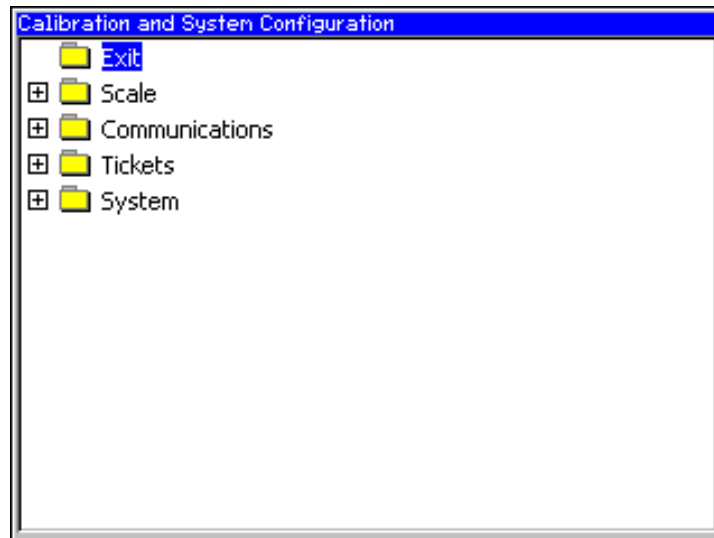
Press the **ENTER** or **RIGHT ARROW** key to expand (open) the menu folder. The folder's parameter pages and sub-folders are displayed.
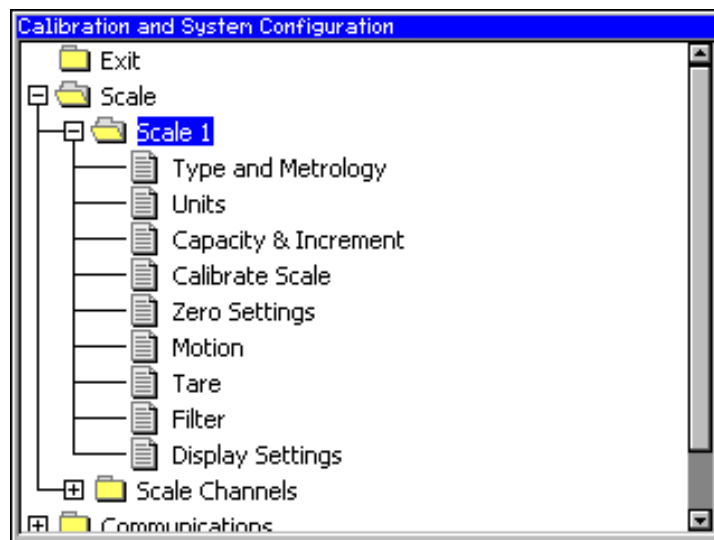
Press the **LEFT ARROW** key to contract the menu folder and return to the main branch of menu folder tree.

Parameter Pages

Parameter Pages access groupings of parameters that may be viewed and/or modified to configure the system.

Highlight the Parameter Page in the menu tree using the **UP** & **DOWN ARROW** keys.
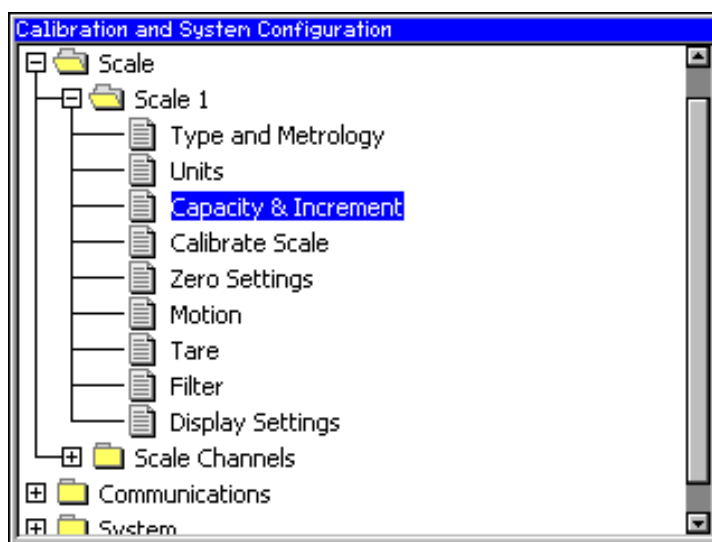
Press the **ENTER** key to open the Parameter Page.

Edit Parameter Values

There are 2 types of parameter fields: Text fields and Dropdown fields. Highlight the parameter using the **UP** & **DOWN ARROW** keys and press **ENTER** to select.

Dropdown Fields

Selecting a parameter with a Dropdown field will display a "dropdown" menu with a defined set of parameter values. Use the **UP** & **DOWN ARROW** keys to highlight the parameter value and press **ENTER** to select.

Text Fields

Selecting a parameter with a Text field will display a blinking cursor in the field.

- Use the **NUMBER** keys to enter values followed by the **ENTER** key.
- The **LEFT** and **RIGHT ARROW** keys may be used to move the cursor.
- The **CLEAR** key can be used to delete an entry.

Example:

The sample screen below shows "Interval 1". Capacity (with a value of 3000) is a Text field and Increment is a Dropdown field.

Press the "**BACK**" function key (**F1**) to return to the menu tree from a Parameter Page.

Entering Alphanumeric Text

Some Text fields require alphanumeric text. Once the parameter is selected, the blinking cursor will be displayed in the field. Letters and characters will also appear in the Function Key Bar cells.

Press the corresponding **FUNCTION** key until the correct character is selected, then press the **RIGHT ARROW** key to advance the cursor to the next character position. The **LEFT ARROW** key moves the cursor back.

Delete characters using the **CLEAR** key.

Press the **ENTER** key to exit the parameter.

The **UP** & **DOWN ARROW** keys toggle the Function Key Bar cells between upper case characters, lower case characters and symbols.

View Weighing Mode Screen in Configuration & Calibration Mode

Toggle between the Menu Tree and the live updating Weighing Mode screen by pressing the **DECIMAL** key.

Changes to scale settings in Configuration & Calibration Mode will appear in the scale display on the Weighing Mode screen.

Changes are not saved until Configuration & Calibration Mode is exited properly.
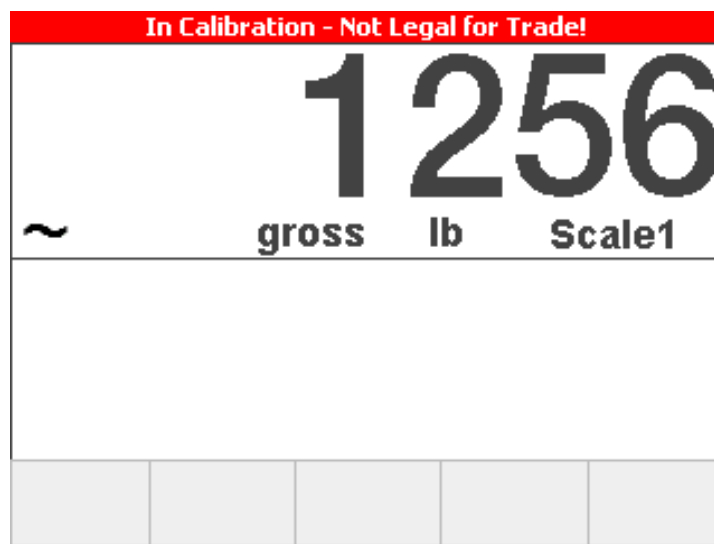
Scale weights cannot be used for trade while in Configuration & Calibration Mode. The Information bar will display a red "Not Legal For Trade" banner when a weight display is shown.

Exit Configuration & Calibration Mode

Use the **UP ARROW** key to scroll to the top of the menu tree to the "Exit" folder and press **ENTER** to select.
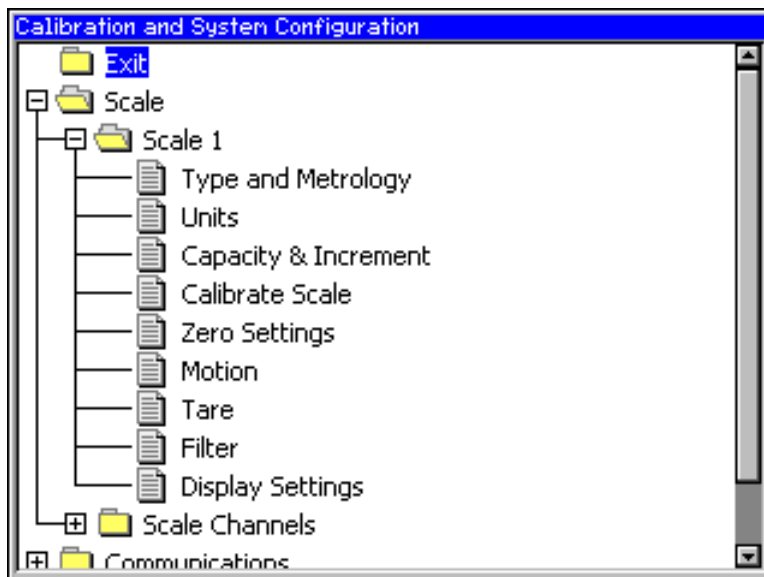
If any settings were changed, a dialog box opens and gives options to exit with or without saving the changes.

Use the **UP** & **DOWN ARROW** keys to highlight how you would like to exit Configuration & Calibration and press **ENTER**.
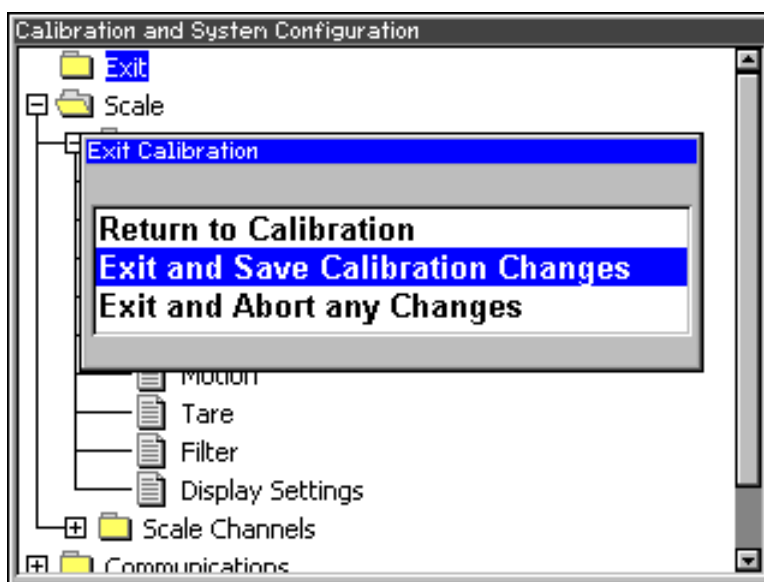
The indicator will return to normal Weighing Mode.

SCALE SET-UP MENU

All scale set-up parameters are grouped under the "Scale" folder in the menu tree. Navigate to the "Scale 1" folder and press the **ENTER** key to show all related Parameter Pages for Scale 1.
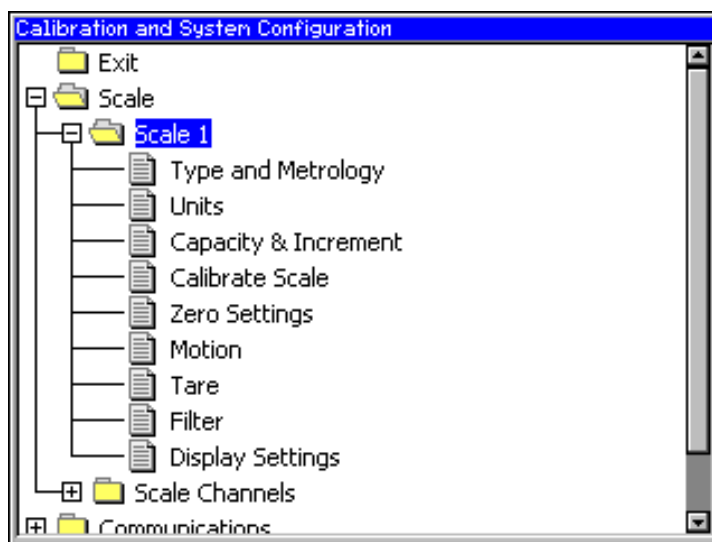
For Multi-Scale systems, each scale will have its own Menu Tree folder and related Parameter Pages.

Parameter Pages related to calibration are:

- Type and Metrology
- Units
- Capacity and Increment
- Calibrate Scale
- Zero Settings
- Motion
- Tare
- Filter
- Display Settings

Highlight Parameter Pages using the **UP** & **DOWN ARROW** keys and press **ENTER** to select.

Type and Metrology

```
Scale 1 Type and Metrology

        Scale Name    Scale1

         Scale Type   Sectional    ▼

           Approval   USA          ▼

  Linerity Correction None    ▼

       Multi Interval  None        ▼

  BACK
```

<u>Scale Name</u>

Each scale in the system can have a customized name (Up to 10 characters).

<u>Approval</u>

Select the metrological jurisdiction for "Legal For Trade" use. This parameter pre-selects parameter values and functionality for the different metrological requirements of various countries.

NONE: Allows a tare weight to be acquired at any positive weight (>0).

Tares can be cleared at any time.

New tares may be acquired even if a previous tare weight is present.

CANADA: Allows a tare weight to be acquired at any positive weight (>0).

Tares can only be cleared when GROSS weight is at no load.

Previous tare weights must be cleared before a new tare weight can be acquired.

NTEP: Allows a tare weight to be acquired at any positive weight (>0).

Tares can only be cleared when GROSS weight is at no load.

New tares may be acquired even if a previous tare weight is present.

<u>Linearity Correction</u>

Multiple span values or linearity points may be used to help correct a scale with structural or load cell non-linearity issues. Select the number needed (Up to 5).

Units

Calibration Units

Select the measurement units for calibrating the scale. Test weight units should match the calibration units (kg or lb).

Alternate Units

Select the alternate measurement units displayed when the **UNITS** key is pressed (kg, lb, oz, g).

Power up Units

Select the default measurement units that the scale will display on power up.

Units Select Key

Enables or disables the **UNITS** key function (toggling between measurement units).

Capacity & Increment

> ## Scale 1 Capacity & Increment
>
> Interval 1   [300]   X [1 ▼] lb
>
> Decimal   [None ▼]
> Scale Over [1d ▼]
>
> BACK

Interval 1

Set the scale's Capacity and Interval. Enter the Capacity in the Text Field and select the Interval in the Dropdown field.

> Capacity: Enter using the number keys followed by **ENTER**
>
> Increment: Select from 1, 2, 5, 10, 20, 50 & 100

Decimal

Select the decimal position of the display as required (Up to 4 decimal places).

Scale Over

Select the number of increments (divisions) over Capacity that will display before an overload condition occurs and the display blanks to "------".

> 04/01/15 05:30:22
>
> ~   gross   lb   Scale1

Calibrate Scale

Calibrating a scale is done in 2 steps: Deadloading and Spanning. The scale must be deadloaded before placing test weights on the scale to calibrate (span).

Scale 1 Calibration

Test Weight `100` lb

RETURN	DEAD LOAD	SPAN SCALE		

Test Weight

Enter the test weight value for calibration. Ensure test weight units match calibration units from the Units Parameter Page.

Deadload (Zero Calibration)

Deadload captures the scale's zero weight (the dead weight of the scale itself).

Press **DEADLOAD** (**F2** key) to begin.

The Deadload screen will appear with a live scale weight display.

Press **START** (**F3** key) to calibrate zero.

Press **RETURN** (**F1** key) to return to the Calibration Parameter Page.

```
                                    0
  ◢◣          gross    lb    Scale1

      Scale1 Deadload
      Remove Load from Scale and Press Start

  RETURN            START
```

Span Scale (Calibrate with Test Weights)

Spanning uses a known Test Weight value to calibrate the scale.

Press **SPAN SCALE** (**F3** key) to begin. The Span Scale screen will appear with a live scale weight display.

Place test weights on the scale equal to the Test Weight parameter value. Exact instructions will appear on the screen.

Press **START** (**F3** key) to calibrate.

Press **RETURN** (**F1** key) to return to the Calibration Parameter Page.

Tip: If necessary, Deadload and Span can be performed repeatedly from their respective screens. Simply press START (**F3**) to calibrate again to the same zero or test weight value.

Linearity Correction (Multiple Span Points)

Linearity correction uses multiple span points to solve linearity problems and must be enabled in the Type and Metrology parameter page. Up to 5 individually calibrated span points may be used.

The calibration procedure for multiple span points is almost the same as for a single span point.

In the Calibrate Scale parameter page, enter the test weight values for each of the span points.

Use the **UP** & **DOWN ARROW** keys to highlight the Test Weight value (span point) that is ready for calibration.

Press **SPAN SCALE** (**F3** key) to begin. The Span Scale screen will appear with a live scale weight display.

Place test weights on the scale equal to the Test Weight parameter value. Exact instructions will appear on the screen.

Press START (**F3** key) to calibrate.

Press RETURN (**F1** key) to return to the Calibration Parameter Page. The next Test Weight value (span point) may then be highlighted and spanned.

Example:

The sample screen below shows a scale with 4 span points and 4 different test weight values. **Test Weight 3** is highlighted for calibration.

Scale 1 Calibration

Test Weight 1	100	kg
Test Weight 2	200	kg
Test Weight 3	300	kg
Test Weight 4	400	kg

THIS TEST WEIGHT VALUE WILL BE CALIBRATED

RETURN	DEAD LOAD	SPAN SCALE		

Tip: Test Weight values may be calibrated in any order and are automatically sorted. Entering a Test Weight value of "0" or not spanning to a value will remove the span point from the table.

Zero Settings

Zero Tracking

Zero Tracking or Automatic Zero Mechanism (AZM) zeroes the scale within this range when the scale is:

- Stable (NOT in motion)
- Within the Push Button Zero range

Zero Tracking compensates for conditions such as debris on a scale platform and small weight drifts caused by the indicator or a load cell. Select a value from 0.5d to 5d or disable. *Subject to regulatory requirements.

Power Up Zero

Enable or disable the automatic zeroing of the scale on power up. Also known as Initial Zero Setting Mechanism (IZSM). The scale will only zero if weight is:

- Stable (NOT in motion)
- Within the Push Button Zero range

Push Button Zero

Select the weight range within which the scale can be zeroed using the **ZERO** key function. The range is based on the last calibrated zero (deadload). Choose values (expressed as a percentage of capacity) from ± 2%, ±10%, ±90% or disabled.

* Legal for Trade applications must be set to ± 2%.

Motion

Scale Motion parameters may be used to adjust how the scale detects motion. This ensures proper zero, tare and print operations (Ex. Cannot print on motion).

Scale Motion

Select the Motion Band in displayed divisions (1d, 2d, 3d, 5d, 10d) or disable. This determines the scale's sensitivity to motion. Weight change (+ or -) must be greater than the selected value to trigger the motion condition.

If disabled, zero, tare and print operations may be carried out despite actual motion on the scale.

Motion Timer

Select the amount of time the motion annunciator remains ON after the scale weight stabilizes within the Scale Motion Band (see above). Choose values from 0.25 to 3 seconds.

Blank Display on Motion

Enable or disable blanking the weight display when motion is detected.

Tare

Scale 1 Tare Settings

Push Button Tare	**Enabled** ▼
Keyboard Tare	Enabled ▼
AutoTare	Disabled ▼
Auto Tare Trigger >	0 kg
Auto Tare Reset <	0 kg
Auto Tare Clear <	0 kg

BACK

Push Button Tare

Enable or Disable the **TARE** key function.

Keyboard Tare

Enable or Disable manually entered keyboard tares.

Auto Tare

Enable or Disable Auto Tare. Auto Tare automatically tares the scale once the weight stabilizes in accordance with the Trigger, Reset and Clear weight settings.

Auto Tare Trigger: Weight on the scale must exceed this value (and be stable) for Auto Tare to activate.

Auto Tare Reset: Weight on the scale must fall below this value before Auto Tare can be activated again.

Auto Tare Clear: Weight on the scale must fall below this value before the stored Auto Tare is cleared.

Filter

The APX uses advanced digital filtering features to keep weight stable in situations where the scale is subject to vibrations or other types of movement. Common applications are onboard weighing, livestock scales and environments with other industrial machinery.

Averaging (Main Filter)

Select the number of A/D samples that are averaged to obtain a displayed reading. Choose from 10 to 200 samples. A higher number reduces noisy readings for increased accuracy but slows down the settling time.

FastStep

Enable or disable the FastStep filter. FastStep detects sudden, significant weight changes and temporarily bypasses the main filter averaging. This improves scale response time to large changes in weight.

FastStep Trigger

If the FastStep filter is enabled, sudden weight changes must exceed this number of divisions before the FastStep filter engages. Choose from 1d to 30d.

FastStep Sensitivity

Select the number of consecutive A/D samples greater than the FastStep Trigger value required to engage the FastStep filter. Choose values from 1 to 30 samples.

Display Settings

Display parameters configure the look of the weight display. Different display sizes and colors may be to show and differentiate between multiple scale channels.

```
            Scale 1 Display Options

      Scale Display Size    Large      ▼

      BackGround Color      None       ▼

      Display Update Rate   0.25 sec   ▼




      ┌────────┬────────┬────────┬────────┬────────┐
      │ BACK   │        │        │        │        │
      └────────┴────────┴────────┴────────┴────────┘
```

Scale Display Size

Select the weight display size. Use a smaller size for viewing multiple scale channels or to make more screen space available for running applications. Choose from Large, Medium, Small and X-Small.

Background Color

Select the weight display background color. Each weight display may have its own color for quick visibility when multiple scales are simultaneously displayed on the screen. Choose from None (White), Yellow, Green and Blue.

Display Update Rate

Select how often the weight display is refreshed. Choose values from 0.15 to 1 second.

MULTI-SCALE SYSTEM CONFIGURATION

The APX can support up to 4 individual scale channels at once. Scale channel weight displays may be shown on the screen individually or simultaneously. Scale channels with the same configuration may be summed together for a "Total" weight display.

Configuring Multiple Scale Channels

Each scale has its own menu folder and branches of the menu tree. Scales are configured, calibrated and operated completely independent of each other. Multiple scales must be enabled in the Scale Channels folder.
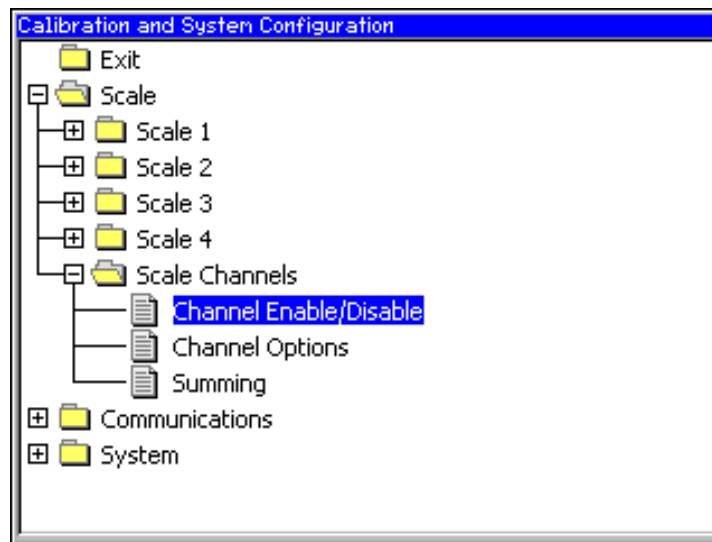
Only scale channels that are enabled will appear in the Menu Folder Tree.

Channel Enable/Disable

Enabling a channel will add a Scale folder to the menu tree. Weight display size is automatically set to fit all weight displays on the screen at once. Sizes can be changed individually afterwards if required.

The sample screen below shows the weight displays with all 4 channels enabled.

Channel Options

Scale Display

Select "Grouped" or "Individual" weight displays. Different applications may require all weight displays or only a single display to be shown. When set to "Individual", the operator may select a scale to display using the keypad in Weighing Mode (see page 12).

Power Up Channel

Select the scale channel to be active / displayed on power up. If Scale Display is set to "Individual", the selected channel's weight display is shown on power up. If Scale Display is set to "Grouped", the selected channel will power up ready to accept function commands via the keypad.

Enable Select

Enable or disable keypad selection of individual scale channels by the operator. Prevents unintended scale operation due to incorrect scale channel.

Summing (Total Mode)

Summing combines the weights of all enabled scale channels into a single weight display. Scale status information such as motion, center of zero and over capacity is also combined.

Summing (Total Mode) requires the following:

- All scale channels must be use the same interval increment (division);
- All scale channels must be calibrated using the same units.

```
                Scale Summing

  Channel Summing    Enabled        ▼

       Sum Name      SUM

    Display Size     Medium         ▼

   Display Color     None      ▼



  BACK
```

Channel Summing

Enable or disable scale channel summing.

Sum Name

The summed weight display can have a customized name (Up to 10 characters).

Display Size

Select the size for the summed weight display. Use a smaller size for viewing multiple scale channels or to make more screen space available for running applications. Choose from Large, Medium, Small and X-Small.

Background Color

Select the background color for the summed weight display. Weight displays may have their own color for quick visibility when multiple displays are shown on the screen. Choose from None (White), Yellow, Green and Blue.

> *NOTE: Scale Channel 1's settings are the reference point for Total Mode.*

COMMUNICATIONS MENU

All communications parameters are grouped under the "Communications" folder in the menu tree. Navigate to the "Communications" folder and press the **ENTER** key to show folders for installed communications ports.

Standard communications ports are:

- COM1 (RS 232)
- COM2 (RS 232)
- COM3 (RS 422)
- NETWORK (Ethernet TCP/IP)

Each port will have its own Menu Tree folder and related Parameter Pages.
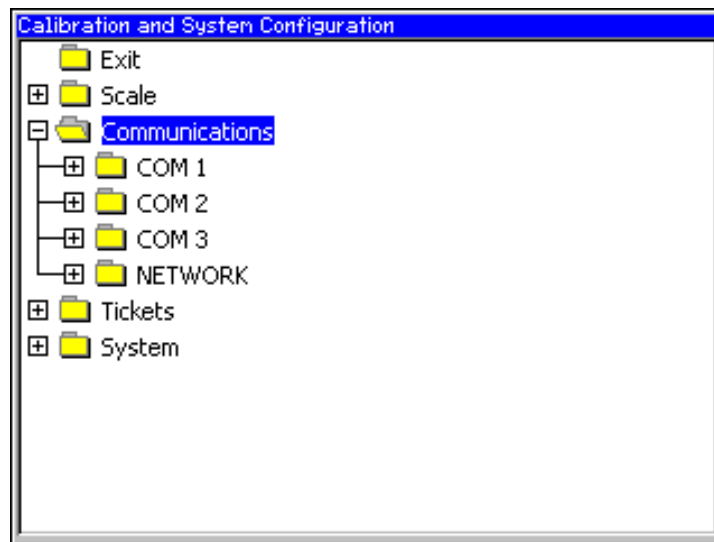
Parameter Pages related to COM ports are:

- Settings
- String Emulation
- String Parsing

Highlight Parameter Pages using the **UP** & **DOWN ARROW** keys and press **ENTER** to select.

Settings

Baud Rate

Select the transmission speed for the selected port.

Data Bits

Select the data bits (8 or 7) for the selected port

Parity

Select the parity bit for the selected port.

Stop Bits

Select the stop bits (1 or 2) for the selected port.

String Emulation

Output Mode

Controls the operation of the selected port.

Stream = Selected data string is output continuously.

Print Ticket = Port is primary port for ticket printing and macro function programs.

String Type

Select the data string. Emulations from many different manufacturers are available.

Stream Delay

Inserts a delay between transmissions from the selected port (in seconds).

Stream Channel

Lock the data stream from the selected port to a specific scale channel.

NETWORK

Networking parameters are grouped under the "NETWORK" folder in the "Communications" menu tree branch.

Parameter Pages related to NETWORK are:

- Ethernet
- IP Address

Ethernet

MAC Address

This read-only field displays the unique identifier assigned to the APX's network interface.

DHCP Client

Enable or disable the DHCP client for assigning the APX's IP address.

Port

Select the TCP port. Communicating devices must share the same port number.

Ethernet Status Display

Enable or disable the Ethernet port status display on the Information Bar.

IP Address

The appearance of this Parameter Page will vary depending on whether the DHCP client is enabled or disabled (see Ethernet, page 46).

```
                        IP Address

      IP Address     192   168   000   001

     Subnet Mask     255   255   255   000

       GateWay       000   000   000   000




      BACK
```

IP Address

DHCP Enabled: The field will be read-only and displays the IP address assigned to the APX by the network's DHCP server.

DHCP Disabled: Use the keypad to enter a **fixed** IP address for the APX.

Subnet Mask

DHCP Enabled: The field will be read-only and displays the assigned subnet mask of the local network.

DHCP Disabled: Use the keypad to enter the local network's subnet mask.

Gateway

DHCP Enabled: The field will be read-only and displays the default gateway address assigned for external network transmissions.

DHCP Disabled: Use the keypad to enter the local network's gateway address.

TICKETS MENU

All printing and ticket programming related parameters are grouped under the "Tickets" folder in the menu tree. Parameter Pages related to tickets are:

- Create New Ticket
- Edit Ticket
- Set Active Ticket
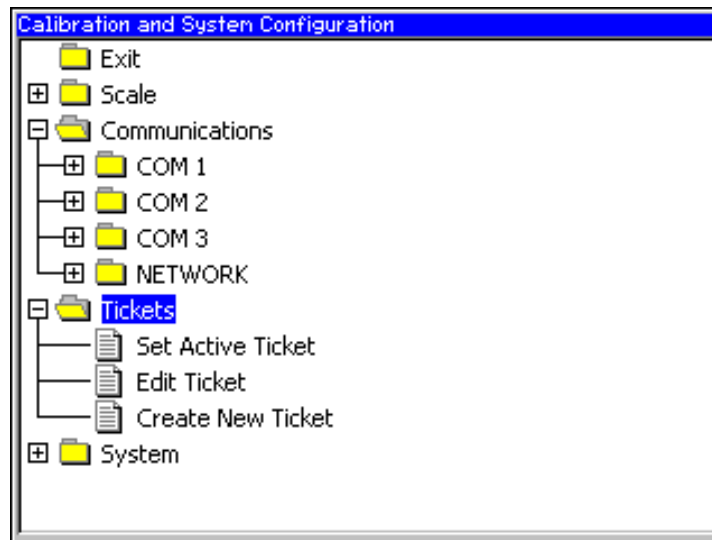
Create New Ticket

The Ticket Editor is opened with a ticket program number automatically assigned (see Information Bar). The Function Key Bar is also populated with functions.

For more information on building a ticket program, see Ticket Editor & Printing Basics, page 54.
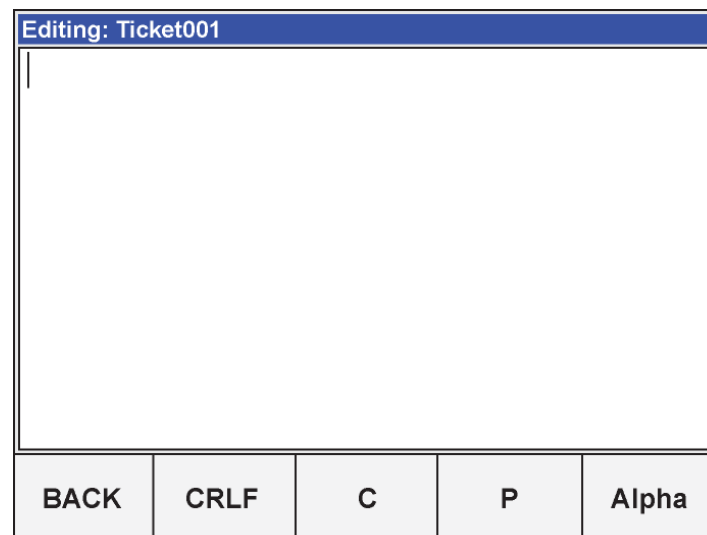
Edit Ticket

Use the **UP** & **DOWN ARROW** keys to scroll through the list of stored tickets.

Pressing **ENTER** will open the selected ticket in the Ticket Editor.

Press the **F1 (BACK)** key to returns to the Configuration & Calibration window.

Set Active Ticket

Use the **UP** & **DOWN ARROW** keys to scroll through the list of stored tickets.
The current active ticket is shown with an asterisk (*****).

Pressing **ENTER** will set the selected ticket as ACTIVE.

Press the **F1 (BACK)** key to returns to the Configuration & Calibration window.

Ticket Editor Screen & Keys

Editing: Ticket001

BACK	CRLF	C	P	Alpha
F1	F2	F3	F4	F5
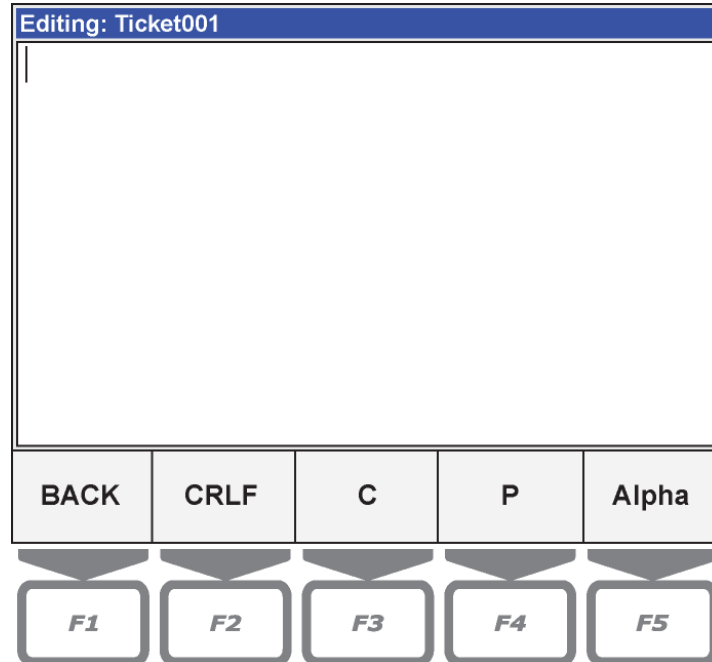
F1 - BACK

Exits the Ticket Editor and returns to the Configuration & Calibration window.

If entries have been made, the Save Ticket Changes window will appear (See page 52).

F2 - CRLF

Inserts ASCII Carriage Return and Line Feed characters (decimal 13 & 10). These characters are displayed as a " **/** " on the Ticket Editor screen.

F3 - C (Control Code)

Inserts the Control Code character "C".

F4 - P (Print Code)

Inserts the Print Code character "P".

F5 - Alpha

Changes the Function Key Bar cells for text character entry. See page 24 for more information on entering text characters and symbols. Pressing the **ENTER** key will switch the Function Key Bar back.

RIGHT ARROW - Advance Cursor

Advances the cursor to the right after a code or character entry.

LEFT ARROW

Moves the cursor to the left.

DOWN ARROW

Moves the cursor to the down.

UP ARROW

Moves the cursor to the up.

ENTER

Adds a new **program line** in the Ticket Editor. The cursor will advance down to a new line.

NOTE: Pressing the **ENTER** key does NOT insert Carriage Return (13) & Line Feed (10) characters in the Ticket program.

CLEAR

Deletes entered text and moves the cursor back.

SPACE

Adds a space and advances the cursor in the Ticket Editor.

NOTE: Pressing the **SPACE** key does NOT insert a space (32) character in the Ticket program unless surrounded by quotes.

Exiting the Ticket Editor

<u>Exit and Save</u>

1. Press the "BACK" soft key (**F1**) to exit the Ticket Editor. The "Save Ticket Changes" screen is displayed.

2. Press the "SAVE" soft key (**F2**). The ticket program is saved and the Configuration & Calibration window is displayed.

If no changes are made to the ticket program, pressing the "BACK" soft key (**F1**) will immediately exit to the Configuration & Calibration window.

<u>Exit **without** Saving</u>

1. Press the "BACK" soft key (**F1**) to exit the Ticket Editor. The "Save Ticket Changes" screen is displayed.

2. Press the "Abort Changes" soft key (**F5**). The Configuration & Calibration window is displayed without saving any changes to the ticket program.

ATTENTION! Selecting "Abort Changes" will delete all the work performed since the program was last saved!

Change the Ticket Program Name (Save As)

1. Press the "BACK" soft key (**F1**) to exit the Ticket Editor. The "Save Ticket Changes" screen is displayed.

2. Press the **ENTER** key to activate the "Ticket Name" text field with a blinking cursor. Letters will appear in the Function Key Bar cells.

3. Change the ticket program name (See "entering alphanumeric text" on page 24 for details).

4. Press the **ENTER** key when done, followed by the "SAVE" soft key (**F2**). The ticket program is saved with the new name and the Configuration & Calibration window is displayed.

TICKET EDITOR & PRINTING BASICS

Ticket programs for printing weigh tickets, labels and performing other macro functions are created and edited directly via the APX keypad in the Ticket Editor. They may also be downloaded from a PC or other external memory such as USB.

Control Codes

Control Codes (or C Codes) command the indicator to perform a specific ticket function. These may include print commands or other macro functions to prompt operators, store values and accumulate weights.

Enter a C Code as the letter C followed by the code number. C Code examples include:

- **C1 - PRINT GROSS WEIGHT**
- **C7 - PRINT TIME**
- **C13 - CLEAR TICKET COUNTER**
- **C70 - INBOUND TRUCK LOOP**

See Control Codes section (page 65) for a complete list.

Printer Codes

Printer Codes (P Codes) transmit pre-defined, printer formatting commands and text strings to the printer. P Codes are generally a consolidated group of ASCII ESC codes (ESC/POS®) as standardized by Epson printers.

Most printers have an Epson or ESC/POS emulation mode which allows P Codes to be used.

Enter a P Code as the letter P followed by the code number. P Code examples include:

- **P101 - CHARACTER HEIGHT**
- **P104 - UNDERLINE MODE**
- **P217 - PAPER RELEASE**

See Printer Codes section – Coming soon.

> *If you cannot find a Printer Code for your application, you can still enter the ESC/POS code in ASCII format. See your printer manual for specific details.*

Printed Text

In the Ticket Editor, printable ASCII characters can be entered without the use of decimal codes by using quotation marks. Whatever text appears within the quotation marks will be transmitted.

   Example: To print *MJ Sand & Gravel*, the program line would read:

   "MJ Sand & Gravel"

Other ASCII Characters & Decimal Codes

Non-printable ASCII characters and control characters may be transmitted by using the associated decimal code. For example, the Form Feed character **<FF>** has a decimal value of **12** and the capital letter **A** has a decimal value of **65**.

In the Ticket Editor, non-printable characters are entered by placing an ampersand "**@**" character before the numeric (decimal) codes. The remainder of the program line will be considered ASCII decimal.

   Example: To transmit a Form Feed <FF>, the program line would read:

   @ 12

See table of ASCII characters and (decimal) codes – coming soon.

Comments

Comments are text within the ticket program used to describe the program's functions. These may be useful when building larger programs or returning to edit the program later.

Anything typed after the period "**.**" character on a program line is ignored when the program runs (commented out).

   Example: For a comment describing a P Code, program line would read:

   P111   .Emphasized Mode

The P111 code is recognized by the indicator but the comments are discarded.

It is good practice to include 4 spaces on the programming line before starting a comment to avoid confusing comments with codes and/or printed text.

Accumulators

Accumulators are memory registers assigned for use with ticket programs. Accessed using C Codes, they are used to store values in the indicator. These values can be scale weights, transaction counts, ticket counts, keypad entries and more.

The Accumulator registers (ACC1 to ACC20) are also used to accumulate weight and perform mathematical operations on the stored values.

Accumulators may either be printed as a number (C6) or a weight (C5) with units (as displayed on the indicator) added.

Example: To store Scale Channel 1, gross weight to Accumulator 1, the program line would read:

C21 1

where: C21 = Gross weight to ACC1 and 1 = Scale Channel 1

IMPORTANT NOTE: The APX Ticket System does not provide any control over units for accumulating weight totals. To ensure accurate weight accumulations, lock the measurement units on the indicator (see Units, page 29).

Key Assignments

When multiple tickets and/or functions are required, Key Assignments are used to define individual tickets within the larger overall ticket program.

Individual tickets are "assigned" to the **PRINT** key, Function keys, or Ticket numbers as entered on the keypad.

[PRINT]	Assign ticket to **PRINT** key
[F1]	Assign ticket to **F1** key
[F2]	Assign ticket to **F2** key
[F3]	Assign ticket to **F3** key
[F4]	Assign ticket to **F4** key
[F5]	Assign ticket to **F5** key
[##]	Assign ticket to a number followed by **ENTER** key.

Example: A simple ticket program assigned to the PRINT key would read:

Line	Code	Description
1	**[PRINT]**	Assigns ticket to **PRINT** key
2	C1	PRINT GROSS WEIGHT
3	@ 13 10	Transmits ASCII Carriage Return and Line Feed characters

Codes entered after a Key Assignment are considered part of that "ticket". The ticket ends at the next Key Assignment or the end of the overall ticket program (whichever is applicable).

Labelling Assigned Function Keys

Assignment functions are also used to place text labels inside the Function Key Bar above the corresponding **F** key.

Example: A ticket program assigned to the F1 key labelled "Truck In":

Line	Code	Description
1	**[F1]="Truck In"**	Assigns ticket to **F1** key and inserts text label.
2	C70	Inbound Truck Loop Function

EXAMPLE 1: TDGTN TICKET (Time, Date, Gross, Tare, Net)

This example demonstrates the creation of a simple ticket that prints the time and date as well as the scale's GROSS, TARE, and NET weights. Carriage Return and Line Feed characters execute printing.

Code	Description
C7	Print Time
C8	Print Date
CRLF	Carriage Return & Line Feed (13, 10). Seen as **/**
C1	Print Gross Weight
CRLF	Carriage Return & Line Feed (13, 10). Seen as **/**
C2	Print Tare Weight
CRLF	Carriage Return & Line Feed (13, 10). Seen as **/**
C3	Print Net Weight
CRLF	Carriage Return & Line Feed (13, 10). Seen as **/**

Step 1: Enter the first code - **C7**. Press the "C" soft key (**F3**) followed by the number **7**. After pressing ENTER, the cursor will advance to the next program line.

Step 2: Enter the second code - **C8**. Press the "C" soft key (**F3**) followed by the number **8**.

F3 → 8 → ENTER

Step 3: Go to the next <u>printed line</u> by entering Carriage Return and Line Feed characters using the "CRLF" soft key (**F2**). <CR><LF> appears as **/** in the Ticket Editor screen.

CRLF

F2

Editing: Ticket001
C7
C8
/

| BACK | CRLF | C | P | Alpha |
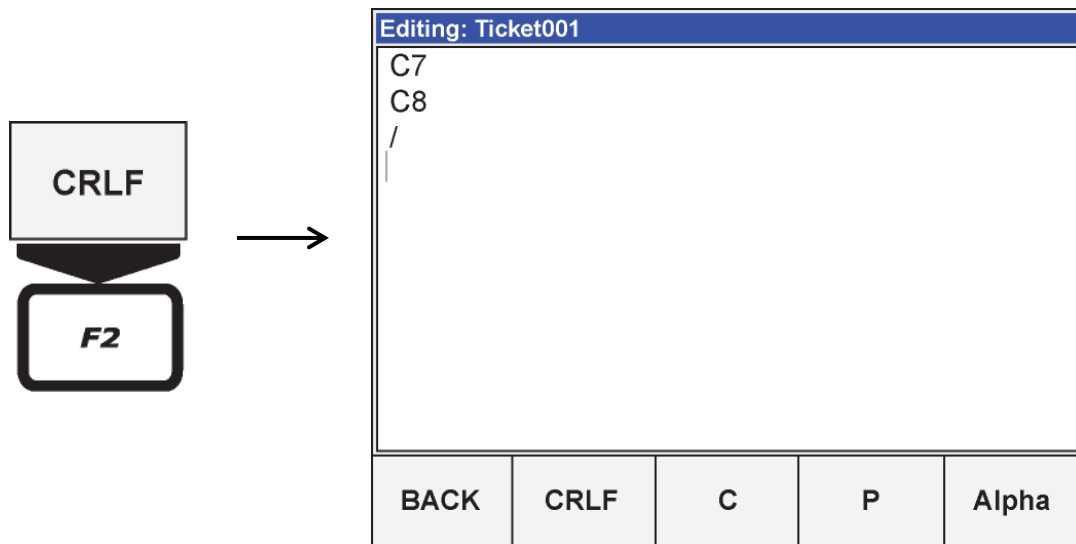
Step 4: Enter the remainder of the codes.

Editing: Ticket001
C7
C8
/
C1
/
C2
/
C3
/

| BACK | CRLF | C | P | Alpha |
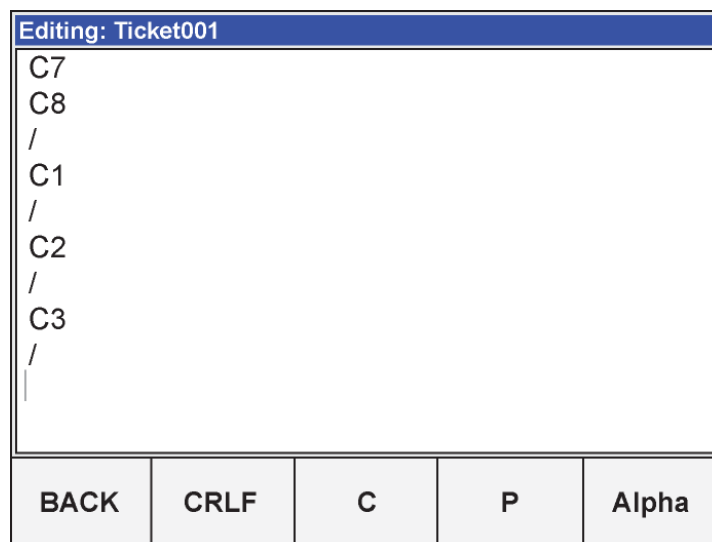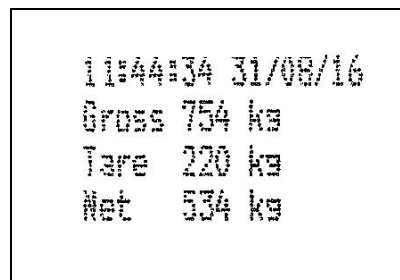
Step 5: Press the "BACK" soft key (**F1**) to exit the Ticket Editor. The "Save Ticket Changes" screen will be displayed.

Step 6: Press the "Save" soft key (**F2**) to save the program.

Step 7: Set Ticket to "ACTIVE" (See page 42).

Step 8: Exit Configuration & Calibration Mode and test the ticket program.

Result: Example 1 will print the following ticket.

```
11:44:34 31/08/16
Gross 754 kg
Tare  220 kg
Net   534 kg
```

Printing Troubleshooting Tips:

If the printer does not print, try the following troubleshooting steps:

- Verify that the printer is a SERIAL printer. Parallel printers are not supported though adapters are available.

- Verify the printer is connected to the correct indicator COM port and the COM port output mode is set to "Print Ticket".

- Verify wiring and ensure communication settings for the indicator and printer are identical. The indicator's default Com Port settings are 9600-N-8-1. For more details, see the Communications section, page 43.

- *Note: if the COM port is set to "Stream", the printer should be printing the scale data string over and over (continuously).*

EXAMPLE 2: TDGTN TICKET WITH HEADER & FORMATTING

Expanding on lessons from Example 1, this ticket program adds a company name and basic print formatting for an Epson, TM-U295 slip printer.

Code	Description
P111	Emphasized Mode ON
P201	Double Height ON
P204	Underline Mode ON
Alpha	"MJ Sand & Gravel"
P208	Normal Character Mode
CRLF	Carriage Return & Line Feed (13, 10). Seen as **/**
CRLF	Carriage Return & Line Feed (13, 10). Seen as **/**
C7	Print Time
C8	Print Date
CRLF	Carriage Return & Line Feed (13, 10). Seen as **/**
CRLF	Carriage Return & Line Feed (13, 10). Seen as **/**
C1	Print Gross Weight
CRLF	Carriage Return & Line Feed (13, 10). Seen as **/**
CRLF	Carriage Return & Line Feed (13, 10). Seen as **/**
C2	Print Tare Weight
CRLF	Carriage Return & Line Feed (13, 10). Seen as **/**
CRLF	Carriage Return & Line Feed (13, 10). Seen as **/**
C3	Print Net Weight
CRLF	Carriage Return & Line Feed (13, 10). Seen as **/**
P217	Paper Release

Result: Example 2 will print the following ticket.

MJ Sand & Gravel

13:33:12 31/08/16

Gross 754 kg

Tare 220 kg

Net   534 kg

EXAMPLE 3: ACCUMULATION & MULTIPLE TICKETS

Building on Example 2, this ticket program uses multiple printed tickets within the ticket program and includes codes for keeping a running total of the net weight and transaction count. A function to clear these totals is also included.

Code	Description
[PRINT]	Assigns Ticket to the PRINT key
P111	Emphasized Mode ON
P201	Double Height ON
P204	Underline Mode ON
Alpha	"MJ Sand & Gravel"
P208	Normal Character Mode
CRLF	Carriage Return & Line Feed (13, 10). Seen as "/"
CRLF	Carriage Return & Line Feed (13, 10). Seen as "/"
C7	Print Time
C8	Print Date
CRLF	Carriage Return & Line Feed (13, 10). Seen as "/"
CRLF	Carriage Return & Line Feed (13, 10). Seen as "/"
C1	Print Gross Weight
CRLF	Carriage Return & Line Feed (13, 10). Seen as "/"
CRLF	Carriage Return & Line Feed (13, 10). Seen as "/"
C2	Print Tare Weight
CRLF	Carriage Return & Line Feed (13, 10). Seen as "/"
CRLF	Carriage Return & Line Feed (13, 10). Seen as "/"
C3	Print Net Weight
CRLF	Carriage Return & Line Feed (13, 10). Seen as "/"
P217	Paper Release
C23	Copy Net Weight to ACC1
C27 2	ACCx = ACCx + ACC1 (ACC2 = ACC2 + ACC1)
C33 3	ACCx = ACCx + 1 (ACC3 = ACC3 + 1)
[F1]="TOTAL"	Assigns Ticket to the F1 key with label
Alpha	"Total Net: "
C5 2	Print ACCx as a weight (x = 2, Print ACC2)
CRLF	Carriage Return & Line Feed (13, 10). Seen as "/"
Alpha	"Total Loads: "
C6 3	Print ACCx as a Number (x = 3, Print ACC3)
CRLF	Carriage Return & Line Feed (13, 10). Seen as "/"
P217	Paper Release
[F5]="CLEAR TOTALS"	Assigns Ticket to the F5 key with label
C20 2	
C20 3	

> *Note that some C codes such as C27 have variable functions that require a value to be entered. In this example, we want to store the running net weight total in ACC2, so "2" follows C27 (C27 2). If we wanted to use ACC17, we would put "17" after C27 (C27 17).*

EXAMPLE 4: BASIC TRUCK IN/OUT LOOP

This program example uses multiple tickets and introduces the LOOP database to store IDs and inbound weights for Truck In/Out weighing. "Print-to-Screen" functions are also covered.

Code	Description
[F1]="TRUCK IN"	Assigns Ticket to the F1 key with label
C100	Clear Screen (Application Display)
C70	Inbound Truck Loop
C40 5	Print Direction (5 = screen)
Alpha	"ID STORED."
CRLF	Carriage Return & Line Feed (13, 10). Seen as "/"
Alpha	"ID: "
C79	Carriage Return & Line Feed (13, 10). Seen as "/"
CRLF	Carriage Return & Line Feed (13, 10). Seen as "/"
C1	Print Gross Weight
CRLF	Carriage Return & Line Feed (13, 10). Seen as "/"
[F5]="TRUCK OUT"	Assigns Ticket to the F5 key with label.
C100	Clear Screen (Application Display)
C71	Outbound Truck Recall
C40 0 5	Print Direction (0=default printer port & 5=screen)
C7	Print Time
C8	Print Date
CRLF	Carriage Return & Line Feed (13, 10). Seen as "/"
C74	Print In/Out Gross Weight
CRLF	Carriage Return & Line Feed (13, 10). Seen as "/"
C75	Print In/Out Gross Weight
CRLF	Carriage Return & Line Feed (13, 10). Seen as "/"
C76	Print In/Out Gross Weight
CRLF	Carriage Return & Line Feed (13, 10). Seen as "/"
P217	Paper Release

Notes:

- "TRUCK IN" ticket prints to screen only.

- "TRUCK OUT" ticket prints to both screen and default com port (printer).

- Paper release code for Epson TM-U295 printer

- Truck IDs and inbound weights are automatically deleted after weighing out.

EXAMPLE 5: FLEET TRUCK IN/OUT (STORED TARES)

This program example uses multiple tickets and introduces stored IDs and inbound weights for Truck In/Out weighing. "Print-to-Screen" functions are also covered.

Code	Description
[F1]="TRUCK IN"	Assigns Ticket to the F1 key with label
C100	Clear Screen (Application Display)
C72	Store Fleet Truck
C40 5	Print Direction (5 = screen)
Alpha	"ID STORED."
CRLF	Carriage Return & Line Feed (13, 10). Seen as "/"
Alpha	"ID: "
C79	Carriage Return & Line Feed (13, 10). Seen as "/"
CRLF	Carriage Return & Line Feed (13, 10). Seen as "/"
C1	Print Gross Weight
CRLF	Carriage Return & Line Feed (13, 10). Seen as "/"
[F5]="TRUCK OUT"	Assigns Ticket to the F5 key with label.
C100	Clear Screen (Application Display)
C71	Outbound Truck Recall
C40 5	Print Direction (5 = screen)
Alpha	"ID FOUND."
CRLF	Carriage Return & Line Feed (13, 10). Seen as "/"
C40 0 5	Print Direction (0=default printer port & 5=screen)
C7	Print Time
C8	Print Date
CRLF	Carriage Return & Line Feed (13, 10). Seen as "/"
C74	Print In/Out Gross Weight
CRLF	Carriage Return & Line Feed (13, 10). Seen as "/"
C75	Print In/Out Gross Weight
CRLF	Carriage Return & Line Feed (13, 10). Seen as "/"
C76	Print In/Out Gross Weight
CRLF	Carriage Return & Line Feed (13, 10). Seen as "/"
P217	Paper Release
[100]="DELETE ID"	Assigns Ticket to 100 + PRINT key
C73	Delete Fleet Truck
C20 3	

Notes:

- "TRUCK IN" ticket prints to screen only.

- "TRUCK OUT" ticket prints to both screen and default com port (printer).

- Paper release code for Epson TM-U295 printer

- Fleet Truck IDs and inbound weights remain stored for multiple weigh-outs.

CONTROL CODES

Control Code	Function / Description
C1 x	**Print GROSS Weight of Channel "x"** Enter the C1 code followed by the scale channel number. If no channel is specified, the currently selected channel is used. C1 = Current CH. Sample Print: Gross 123456 lb C1 1 = CH. 1 C1 2 = CH. 2 C1 3 = CH. 3 C1 4 = CH. 4 C1 5 = Sum CH.
C2 x	**Print TARE Weight of Channel "x"** Enter the C2 code followed by the scale channel number. If no channel is specified, the currently selected channel is used. C2 = Current CH. Sample Print: Tare 123456 lb C2 1 = CH. 1 C2 2 = CH. 2 C2 3 = CH. 3 C2 4 = CH. 4 C2 5 = Sum CH.
C3 x	**Print NET Weight of Channel "x"** Enter the C3 code followed by the scale channel number. If no channel is specified, the currently selected channel is used. C3 = Current CH. Sample Print: Net 123456 lb C3 1 = CH. 1 C3 2 = CH. 2 C3 3 = CH. 3 C3 4 = CH. 4 C3 5 = Sum CH.
C4 x	**Print DISPLAYED Weight of Channel "x"** Print the weight as it appears on the display, regardless of mode. Enter the C4 code followed by the scale channel number. If no channel is specified, the currently selected channel is used. C4 = Current CH. C4 1 = CH. 1 C4 2 = CH. 2 C4 3 = CH. 3 C4 4 = CH. 4 C4 5 = Sum CH.

Control Code	Function / Description
C5 x	**Print ACCx as a Weight** Prints the value stored in ACCx as a weight followed by units where x is the Accumulator number (1 to 20). Ex. To print ACC4, enter a C5 code followed by 4 (C5 4).
C6 x	**Print ACCx as a Number** Prints the value stored in ACCx as a number (no weight formatting) where x is the Accumulator number (1 to 20). Ex. To print ACC3, enter a C5 code followed by 3 (C6 3).
C7	**Print TIME** Time is printed as configured on the indicator. 12 or 24 Hour clock
C8	**Print DATE** Date is printed as configured on indicator. dd/mm/yy, mm/dd/yy, etc.
C9	**No Weight Header** Removes the pre-programmed weight headers (Gross, Tare, Net) from C1, C2 & C3. Place this code at or near the beginning of the ticket. Weight Headers are reset after the ticket completes.
C10	**No Units** Removes the measurement units (kg, lb, etc.) from printed weight codes (C1, C2, C3, etc.). Place this code at the beginning of the ticket. Units are reset after the ticket completes.
C11 x	**Print Scale Name of Channel "x"** Scale Name is printed as configured on the indicator. Enter the C11 code followed by the scale channel number. If no channel is specified, the currently selected channel is used.
C12	**Print Ticket Counter (+1)** Prints the Ticket Counter Register, then adds 1 to it. The Ticket Counter Register is 4 digits (000 to 9999). After 9999, the register rolls over to 0000.
C13	**Clear Ticket Counter** Sets the Ticket Counter Register to **1**.
C14	**Increment Ticket Counter (+1)** Adds 1 to the Ticket Counter Register. Register does not print.
C15	**Print Ticket Counter** Prints the Ticket Counter Register (but does not add to it).
C16	**Print Displayed Units of Channel "x"** Prints the current units displayed on the scale channel. Enter the C14 code followed by the scale channel number. If no channel is specified, the currently selected channel is used.

Control Code	Function / Description
C20 x	**Clear ACCx** Sets the value of ACCx to zero, where x is the Accumulator number (1 to 20). Ex. "C20 1" clears ACC1 to zero.
C21 x	**GROSS of Channel "x" → ACC1** Store Gross Weight in ACC1
C22 x	**TARE of Channel "x" → ACC1** Store Tare Weight in ACC1
C23 x	**NET of Channel "x"→ ACC1** Store Net Weight in ACC1
C24 x	**DISPLAYED of Channel "x" → ACC1** Store Indicator's Displayed weight in ACC1
C25 x	**ACC1 → ACCx** Copy value in ACC1 to ACCx, where x is the Accumulator number (1 to 20). Ex. "C25 2" copies ACC1 to ACC2.
C26 x	**ACCx → ACC1** Copy value in ACCx to ACC1, where x is the Accumulator number (1 to 20). Ex. "C26 4" copies ACC4 to ACC1.
C27 x	**ACCx = ACCx + ACC1** Add the value in ACC1 to the value in ACCx, where x is the Accumulator number (1 to 20).
C28	**ACC1 = ACC2 + ACC3** Add ACC2 to ACC3 and store the result in ACC1, where x is the Accumulator number (1 to 20).
C29	**ACC1 = ACC2 – ACC3**
C30	**ACC3 = ACC4 * (ACC2 / 100)** Store a percentage of ACC4 in ACC3. Set the desired percentage value (1-99) in ACC2. Ex. Store 50% of ACC4 in ACC3. If ACC4 = 500 & ACC2 = 50 ACC3 = 500 * (50/100) = 250
C31	**ACC1 = ACC2 / ACC3**
C32	**ACC1 = ACC2 * ACC3**
C31	**ACC1 = ACC2 / ACC3**
C32	**ACC1 = ACC2 * ACC3**
C33	**ACCx = ACCx + 1** Adds 1 to the value in ACCx where x is the Accumulator number (1 to 20).

Control Code	Function / Description
C40 x	**Print Direction** Direct printing to a specific port or the Application Display. A single ticket program may output to multiple ports and the display using this function. x = 0 = Default (Selection from Config Mode) x = 1 = Com 1 x = 2 = Com 2 x = 3 = Com 3 x = 4 = Reserved for future use. x = 5 = Screen (Application Display) x = 6 = Reserved for future use. x = 7 = Ethernet x = 8 = Reserved for future use.
C41	**Print Lockout** Printing or macro function cannot run again until the scale weight returns to ±3d of zero.

| Control Code	Function / Description
C50	**Keypad Entry** Opens an operator prompt window to store keypad-entered numeric values in a specialized string register (Keypad Entry register). Text for the prompt and string register formatting is done using C codes C52 to C55. Alphanumeric text may be used if code C55 is inserted before C50.
C51	**Set Keypad Entry Prompt** Enter prompt text in quotation marks after C51 code. Ex. C51 "Enter Product #: ".
C52 x	**Set Keypad Entry Color** Select the background color for the keypad entry prompt window. x = 0 = White x = 1 = Red x = 2 = Yellow x = 3 = Orange
C53 x	**Set Keypad Entry Maximum Length** Enter the maximum number of characters allowed for the Keypad Entry register. <u>Add this code before C50.</u> x = number after of characters (1 to 80).
C54 x	**Set Keypad Entry Minimum Length** Enter the minimum number of characters for the keypad entry register. Entries smaller than this will not be valid. x = number after of characters (1 to 80).
C55	**Alphanumeric Keypad Entry** Allows the Keypad Entry register to accept alphanumeric strings and values. <u>Add this code before C50.</u> Letters and characters will appear in the Function Key Bar cells.
C56	**Keypad Entry Register (Numeric) → ACC1** Copy the numeric value in the Keypad Entry register to ACC1.
C59	**Print Keypad Entry Register** Prints the string stored in the Keypad Entry register.

Control Code	Function / Description
C70	**Inbound Truck Loop** Prompts the operator for ID #, then stores the ID and current scale weight in the Truck Loop database. The ID must be weighed out (C71) before the ID # may be used again. Press the "Cancel" soft key (**F1**) to abort.
C71	**Outbound Truck Recall** Prompts the operator for ID #, then re-calls the stored (inbound) weight from the Loop or Fleet database. If the ID was stored using the Loop database, the ID and inbound weight are automatically deleted after the transaction completes. If the ID was stored using the Fleet database, the ID and inbound weight remain stored in memory. Press the "Cancel" soft key (**F1**) to abort. ID NOT FOUND.
C72	**Store Fleet Truck** Prompts the operator for ID #, then stores the ID and current scale weight (tare) in the Truck Fleet database. The same ID may be re-weighed as required. Press the "Cancel" soft key (**F1**) to abort.
C73	**Delete Fleet Truck** Prompts the operator for ID # to delete from memory. This code is used with the Fleet database. Press the "Cancel" soft key (**F1**) to abort.
C74	**Print In/Out GROSS Weight** The gross (larger) weight from the Truck In/Out transaction is printed. Use after the outbound (C71) function.
C75	**Print In/Out TARE Weight** The tare (smaller) weight from the Truck In/Out transaction is printed. Use after the outbound (C71) function.
C76	**Print In/Out NET Weight** The net weight (gross - tare) from the Truck In/Out transaction is printed. Use after the outbound (C71) function.
C79	**Print ID** The last ID entered is printed.
C80	**Set Inbound Prompt** Replace default inbound prompt with custom message.
C81	**Set Outbound Prompt** Replace default outbound prompt with custom message.

Control Code	Function / Description
C100	**Clear Application Display** Clears printed text from the indicator's Application display.
C102 x y	**Set Cursor Position** Place the cursor anywhere on the Application display using x (horizontal) and y (vertical) coordinates. The App display is 320px x 200px with the 0,0 coordinate being the top left corner. Ex. C102 10 20 places the cursor 10 pixels right and 20 pixels down from the top left corner
C103	**Draw Box** Draws a square or rectangle in the Application Display using the x (horizontal) and y (vertical) coordinates provided. The App display is 320px x 200px with the 0,0 coordinate being the top left corner. X1y1 is the top left corner of the box X2Y2 is the bottom right corner of the box
C104 x	**Set Horizontal Margin** Set the screen margin on the Application display using the x (horizontal) coordinate. When printing to the App display, a <CR> will return the cursor to this coordinate. The App display is 320 pixels wide.

SYSTEM MENU

Parameters related to the indicator's general system are grouped under the "System" folder in the menu tree. Parameter Pages include:

- Set Time & Date
- Time & Date Format
- System Factory Reset
- Change Login Password
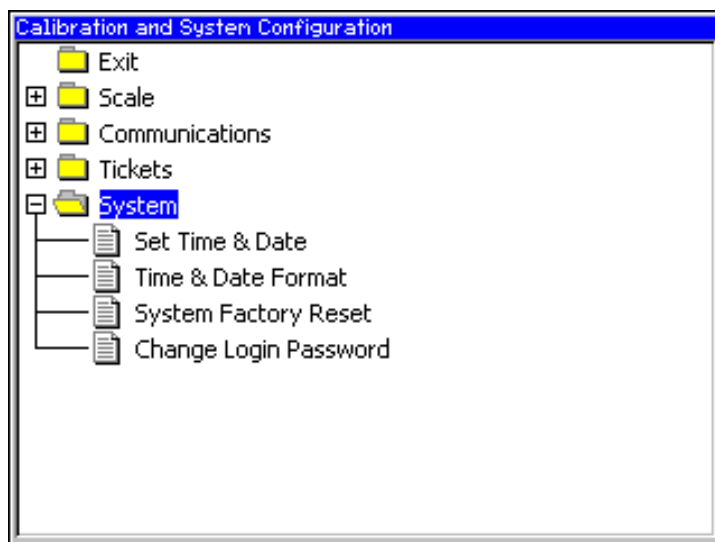
Set Time & Date

Hour (AM/PM)

Enter the hour.

AM/PM

Select AM or PM. NOTE: This box will not appear if a 24 Hour Clock format is selected in the "Time & Date Format" Parameter Page, page 74.

Minute

Enter the minute.

Day

Enter the day.

Month

Select the month.

Year

Enter the year.

Time & Date Format

Time Format

Select the time format: 12 HR Clock (with seconds)
                          12 HR Clock (without seconds)
                          24 HR Clock (with seconds)
                          24 HR Clock (without seconds)

Date Format

Select the time format: International (DD/MM/YY)
                          US (MM/DD/YY)

Field Seperator

Select the character for separating date fields. Select from: **/** , **-** , or **space**.

Display Time & Date

Enable or disable the Time & Date display on the Information Bar.

System Factory Reset

This function resets <u>ALL</u> parameters back to factory values. System Configuration & Calibration Login password is required!

<u>Enter Password</u>

1. Key in the System Configuration & Calibration Login Password.

2. Press **ENTER** to confirm or press the "**BACK**" function key (**F1**) to abort.

> ⚠️ **IMPORTANT!** All previously saved calibration values and system settings for the device will be lost! Ensure the system is backed up before proceeding.

Change Login Password

Displays the System Configuration & Calibration Login Password and allows for the password to be edited if required.

Change Password

1. Key in a new System Configuration & Calibration Login Password.

2. Press **ENTER** to confirm or press the "**BACK**" function key (**F1**) to abort.

> ⚠️ **IMPORTANT!** If the password is forgotten, Calibration Mode will be <u>inaccessible</u>! Record ALL password changes and alert the customer. If the password is lost, call the factory for assistance.

SEALING THE INDICATOR (LEGAL FOR TRADE)

Electronic Seal

Calibration and configuration settings are electronically sealed with a password. This safeguard helps prevent accidental or unauthorized alteration of important scale settings.

> ⚠️ **IMPORTANT!** If the password is forgotten, Calibration Mode will be inaccessible. Record ALL password changes and alert the customer. If the password is lost, call the factory for assistance.

The APX features a **Category 1 Audit Trail System** for recording changes in calibration. Two counters are utilized:

Calibration Counter: Increments by 1 whenever the scale is deadloaded or calibrated.

Configuration Counter: Increments by 1 whenever changes are made to parameters affecting scale setup.

The counters increment for each Calibration Mode session where parameters are changed. Multiple changes may be made for each counter increase, but simply entering and exiting Calibration Mode does not increment the counters. The counters will count from 0 to 999 before rolling over to 0 again.

> ℹ️ **Important Note:** Because the Audit Trail becomes active during factory testing, the Calibration and Configuration Counters may not be **0** when the indicator is new out of the box.

The counters can be accessed at any time by pressing the **LEFT** and **RIGHT ARROW** keys together in Weighing Mode.

The Calibration audit counter and Configuration audit count will display in the "LOGIN" dialog box on the screen.

System Configuration and Calibration Login
LOGIN:
Audit Calibration: 22
Audit Configuration: 28