AccuMeter™
Continuous Loss-in-Weight Feeding Systems
with
Allen-Bradley COMPACTLOGIX™
Control System

Part Number: 882.01181.00
Bulletin Number: BF1-625.1
Effective: 5-5-14

Since we are committed to a continuing program of product improvement, specifications, appearance, and dimensions described in this manual are subject to change without notice.

DCN No. ____________
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Shipping Information

Unpacking and Inspection
You should inspect your equipment for possible shipping damage. Thoroughly check the equipment for any damage that might have occurred in transit, such as broken or loose wiring and components, loose hardware and mounting screws, etc.

In the Event of Shipping Damage
According to the contract terms and conditions of the Carrier, the responsibility of the Shipper ends at the time and place of shipment.

Notify the transportation company’s local agent if you discover damage
Hold the damaged goods and packing material for the examining agent’s inspection. Do not return any goods before the transportation company’s inspection and authorization.

File a claim with the transportation company. Substantiate the claim by referring to the agent’s report. A certified copy of our invoice is available upon request. The original Bill of Lading is attached to our original invoice. If the shipment was prepaid, write us for a receipted transportation bill.

Advise customer service regarding your wish for assistance and to obtain an RMA (return material authorization) number.

If the Shipment is Not Complete
Check the packing list as back-ordered items are noted on the packing list. In addition to the equipment itself, you should have:

✓ Bill of lading
✓ Packing list
✓ Operating and Installation packet
✓ Electrical schematic and panel layout drawings
✓ Component instruction manuals (if applicable)

Re-inspect the container and packing material to see if you missed any smaller items during unpacking.

If the Shipment is Not Correct
If the shipment is not what you ordered, contact the Parts and Service Department immediately. Have the order number and item number available.

Hold the items until you receive an RMA number and shipping instructions.

Returns
Do not return any damaged or incorrect items until you receive shipping instructions from the shipping department.
Credit Returns

Prior to the return of any material, authorization must be given by the manufacturer. A RMA number will be assigned for the equipment to be returned.

Reason for requesting the return must be given.

ALL returned material purchased from the manufacturer returned is subject to 15% ($75.00 minimum) restocking charge.

ALL returns are to be shipped prepaid.

The invoice number and date or purchase order number and date must be supplied.

No credit will be issued for material that is not within the manufacturer’s warranty period and/or in new and unused condition, suitable for resale.

Warranty Returns

Prior to the return of any material, authorization must be given by the manufacturer. A RMA number will be assigned for the equipment to be returned.

Reason for requesting the return must be given.

All returns are to be shipped prepaid.

The invoice number and date or purchase order number and date must be supplied.

After inspecting the material, a replacement or credit will be given at the manufacturer’s discretion. If the item is found to be defective in materials or workmanship, and it was manufactured by our company, purchased components are covered under their specific warranty terms.
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Chapter 1: Safety

1-1 How to Use This Manual

Use this manual as a guide and reference for installing, operating, and maintaining your Continuous Loss-in-weight Blender. The purpose is to assist you in applying efficient, proven techniques that enhance equipment productivity.

This manual covers only light corrective maintenance. No other maintenance should be undertaken without first contacting a service engineer.

The Functional Description section outlines models covered, standard features, and safety features. Additional sections within the manual provide instructions for installation, pre-operational procedures, operation, preventive maintenance, and corrective maintenance.

The Installation chapter includes required data for receiving, unpacking, inspecting, and setup of the blender. We can also provide the assistance of a factory-trained technician to help train your operator(s) for a nominal charge. This section includes instructions, checks, and adjustments that should be followed before commencing with operation of the Continuous Loss-in-Weight Blender. These instructions are intended to supplement standard shop procedures performed at shift, daily, and weekly intervals.

The Operation chapter includes a description of electrical and mechanical controls, in addition to information for operating the unit safely and efficiently.

The Maintenance chapter is intended to serve as a source of detailed assembly and disassembly instructions for those areas of the equipment requiring service. Preventive maintenance sections are included to ensure that your Continuous Loss-in-Weight Blender provides excellent, long service.

The Troubleshooting chapter serves as a guide for identification of most common problems. Potential problems are listed, along with possible causes and related solutions.

The Appendix contains technical specifications, drawings, schematics, parts lists, and available options. A spare parts list with part numbers specific to your machine is provided with your shipping paperwork package. Refer to this section for a listing of spare parts for purchase. Have your serial number and model number ready when ordering.
Safety Symbols Used in this Manual
The following safety alert symbols are used to alert you to potential personal injury hazards. Obey all safety messages that follow these symbols to avoid possible injury or death.

**DANGER!**  
*DANGER* indicates an imminently hazardous situation that, if not avoided, will result in death or serious injury.

**WARNING!**  
*WARNING* indicates a potentially hazardous situation or practice that, if not avoided, could result in death or serious injury.

**Caution!**  
*CAUTION* indicates a potentially hazardous situation or practice that, if not avoided, may result in minor or moderate injury or in property damage.

Continuous Loss-in-Weight Blender Safety Tags

<table>
<thead>
<tr>
<th>Tag</th>
<th>Description</th>
<th>Tag</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Pinch Point - Slide Gate" /></td>
<td>Pinch Point - Slide Gate</td>
<td></td>
<td>Read Operation &amp; Installation Manual</td>
</tr>
<tr>
<td><img src="image" alt="Shear Point - Rotating Mixer or Agitator" /></td>
<td>Shear Point - Rotating Mixer or Agitator</td>
<td><img src="image" alt="Earth Ground" /></td>
<td>Earth Ground</td>
</tr>
<tr>
<td><img src="image" alt="High Voltage Inside Enclosure" /></td>
<td>High Voltage Inside Enclosure</td>
<td><img src="image" alt="PE" /></td>
<td>Protected Earth Ground</td>
</tr>
<tr>
<td><img src="image" alt="Shear Hazard - Rotating Auger" /></td>
<td>Shear Hazard - Rotating Auger</td>
<td></td>
<td>Lifting Point</td>
</tr>
</tbody>
</table>
1-2 **Warnings and Precautions**

Our equipment is designed to provide safe and reliable operation when installed and operated within design specifications, following pertinent local and national codes. This may include, but is not limited to OSHA, NEC, NFPA, CSA, UL, CE, SPI, and any other local, national and international regulations.

To avoid possible personal injury or equipment damage when installing, operating, or maintaining this equipment, use good judgment and follow these safe practices:

- **Read and follow these operation and installation instructions when installing, operating, and maintaining this equipment.** If these instructions become damaged or unreadable, additional copies are available from the manufacturer.
- **Follow all SAFETY CODES.**
- **Keep fingers away from slide gates, augers, clean-outs, and calibration hatches.** Automatic operation may start unexpectedly, **A PINCH HAZARD CAPABLE OF CAUSING BODILY INJURY EXISTS ANY TIME THE POWER IS ON.**
- **Wear SAFETY GLASSES and WORK GLOVES.**
- **Work only with approved tools and devices.**
- **Disconnect and/or lock out power and compressed air before servicing or maintaining the equipment.**
- **Use care when LOADING, UNLOADING, RIGGING, or MOVING this equipment.**
- **Operate this equipment within design specifications.**
- **OPEN, TAG, and LOCK ALL DISCONNECTS** before working on equipment.
  You should remove the fuses and carry them with you.
- **NEVER PUT FINGERS OR TOOLS IN AN AUGER OR SLIDE GATE AREA.**
- **Make sure the equipment and components are properly GROUNDED** before you switch on power.
- **Do not restore power until you remove all tools, test equipment, etc., and the equipment and related components are fully reassembled.**
- **Only PROPERLY TRAINED personnel familiar with the information in this manual should work on this equipment.**

We have long recognized the importance of safety and have designed and manufactured our equipment with operator safety as a prime consideration. We expect you, as a user, to abide by the foregoing recommendations in order to make operator safety a reality.
1-3 Responsibility
These machines are constructed for maximum operator safety when used under standard operating conditions and when recommended instructions are followed in the maintenance and operation of the machine.

All personnel engaged in the use of the machine should become familiar with its operation as described in this manual.

Proper operation of the machine promotes safety for the operator and all workers in its vicinity.

Each individual must take responsibility for observing the prescribed safety rules as outlined. All warning and danger signs must be observed and obeyed. All actual or potential danger areas must be reported to your immediate supervisor.

General Responsibility
No matter who you are, safety is important. Owners, operators and maintenance personnel must realize that safety is always a vital part of their jobs.

If your main concern is loss of productivity, remember that production is always affected in a negative way following an accident. The following are some of the ways that accidents can affect your production:

• Loss of a skilled operator (temporarily or permanently)
• Breakdown of shop morale
• Costly damage to equipment
• Downtime

An effective safety program is responsible and economically sound.

Organize a safety committee or group, and hold regular meetings. Promote this group from the management level. Through this group, the safety program can be continually reviewed, maintained, and improved. Keep minutes or a record of the meetings.

Hold daily equipment inspections in addition to regular maintenance checks. You will keep your equipment safe for production and exhibit your commitment to safety.

Please read and use this manual as a guide to equipment safety. This manual contains safety warnings throughout, specific to each function and point of operation.
Operator Responsibility

The operator’s responsibility does not end with efficient production. The operator usually has the most daily contact with the equipment and intimately knows its capabilities and limitations.

Plant and personnel safety is sometimes forgotten in the desire to meet incentive rates, or through a casual attitude toward machinery formed over a period of months or years. Your employer probably has established a set of safety rules in your workplace. Those rules, this manual, or any other safety information will not keep you from being injured while operating your equipment.

Learn and always use safe operation. Cooperate with co-workers to promote safe practices. Immediately report any potentially dangerous situation to your supervisor or appropriate person.

REMEMBER:

• NEVER place your hands or any part of your body in any dangerous location.
• NEVER operate, service, or adjust the blender without appropriate training and first reading and understanding this manual.
• NEVER try to pull material out of the blender with your hands while it is running!
• Before you start the blender check the following:
  o Remove all tools from the unit;
  o Be sure no objects (tools, nuts, bolts, clamps, bars) are laying in the metering or mixing area;
• If your blender has been inoperative or unattended, check all settings before starting the unit.
• At the beginning of your shift and after breaks, verify that the controls and other auxiliary equipment are functioning properly.
• Keep all safety guards in place and in good repair. NEVER attempt to bypass, modify, or remove safety guards. Such alteration is not only unsafe, but will void the warranty on your equipment.
• When changing control settings to perform a different mode of operation, be sure selector switches are correctly positioned. Locking selector switches should only be adjusted by authorized personnel and the keys removed after setting.
• Report the following occurrences IMMEDIATELY:
  o unsafe operation or condition
  o unusual blender action
  o leakage
  o improper maintenance
• NEVER stand or sit where you could slip or stumble into the blender while working on it.
• DO NOT wear loose clothing or jewelry, which can be caught while working on a blender. In addition, cover or tie back long hair.
• Clean the blender and surrounding area **DAILY**, and inspect the machine for loose, missing or broken parts.

• Shut off power to the blender when it is not in use. Turn the switch to the **OFF** position, or unplug it from the power source.

**Maintenance Responsibility**

Proper maintenance is essential to safety. If you are a maintenance worker, you must make safety a priority to effectively repair and maintain equipment.

Before removing, adjusting, or replacing parts on a machine, remember to turn off all electric supplies and all accessory equipment at the machine, and disconnect and lockout electrical power. Attach warning tags to the disconnect switch.

When you need to perform maintenance or repair work on a blender above floor level, use a solid platform or a hydraulic elevator. If there is a permanently installed catwalk around your blender, use it. The work platform should have secure footing and a place for tools and parts. **DO NOT** climb on unit, machines, or work from ladders.

If you need to repair a large component, use appropriate handling equipment. Before you use handling equipment (portable “A” frames, electric boom trucks, fork trucks, overhead cranes) be sure the load does not exceed the capacity of the handling equipment or cause it to become unstable.

Carefully test the condition of lifting cables, chains, ropes, slings, and hooks before using them to lift a load.

Be sure that all non-current carrying parts are correctly connected to earth ground with an electrical conductor that complies with current codes. Install in accordance with national and local codes.

When you have completed the repair or maintenance procedure, check your work and remove your tools, rigging, and handling equipment.

Do not restore power to the blender until all persons are clear of the area. **DO NOT** start and run the unit until you are sure all parts are functioning correctly.

**BEFORE** you turn the blender over to the operator for production, verify all enclosure panels, guards and safety devices are in place and functioning properly.

**Reporting a Safety Defect**

If you believe that your equipment has a defect that could cause injury, you should immediately discontinue its use and inform the manufacturer.

The principle factors that can result in injury are failure to follow proper operating procedures (i.e. lockout/tagout), or failure to maintain a clean and safe working environment.
Chapter 2: Functional Description

2-1 Models Covered in This Manual
This manual provides operation, installation, and maintenance instructions for continuous loss-in-weight blenders of various blending rates and specifications. See Figure 1 below for a list of available models and specifications.

Figure 1: Models Covered by this Manual (✓ - Denotes Availability)

<table>
<thead>
<tr>
<th>Model</th>
<th>AMP</th>
<th>AMC</th>
<th>AMF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blending Capability</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 components</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>3 components</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>4 components</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>6 components</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>8 components</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Maximum blending rate in lbs./hr. (kgs./hr) ✓</td>
<td>Up to 16,500 (7500)</td>
<td>Up to 16,500 (7500)</td>
<td>Up to 2,500 (1,100)</td>
</tr>
</tbody>
</table>

✓ Actual rates will vary. Consult the factory for guaranteed blending rates.

Model numbers are listed on the serial tag. Make sure you know the model and serial number of your equipment before contacting the manufacturer for parts or service.

Blending systems are as varied as the applications they are designed for. All continuous loss-in-weight blenders are sized to meet the specific requirements stated by the customer at the time of purchase, and future changes may require a modification to the original system.

2-2 General Description
All blenders are designed to blend plastic pellets and regrind, and supply the blended material to the extruder. The standard system is not designed to blend powder or any other no-free-flowing materials. Consult the factory if your future process requirements require the addition of these materials.

Accessories
The manufacturer offers a variety of options for these blending systems, including mezzanine stands, agitated regrind supply and weigh hoppers, etc. All accessories are designed and manufactured to ensure proper results for your application.

Customer Service
The intent of this manual is to familiarize the operator and maintenance personnel with these blenders and help your organization get the maximum service from your equipment. If you have any questions regarding installation, service, repair, custom equipment, or applications, please do not hesitate to contact us for the information required. Prices for additional equipment, accessories, or repair parts will be furnished promptly upon request.

Note: If you desire to use a blender for an application other than that for which it was purchased, please contact your sales representative or our factory to verify compatibility of the equipment with the new process. Misapplication of the equipment could result in injury to the operator or damage to the equipment.
2-3 Typical Features & Components

Mechanical Features

- Adjusts individual feeders to match learned extruder rate at the ratio required.
- Upper material re-fill hoppers with conical, butterfly of slide gate style re-fill valves and dust boots, depending on model.
- Individual ingredient weigh hoppers.
- Cast aluminum feeder housings with drains on pellet feeders.
- Cast or fabricated stainless steel feeder bodies on powder feeders.
- Lower mass flow weigh hopper assembly with clear side wall depending on model.
- Cascading mixing section or collection hopper, depending on model.
- Analog or digital load cell weighing system, depending on model
- Eaton AC drive (VFD) or KB PWM DC drive systems, depending on model
- Motor drive panel – NEMA 12 enclosure
- Mezzanine or machine-mount
- Hopper lids arranged for manufacturer and non-manufacturer receivers and loaders
Control System Features

• Allen-Bradley CompactLogix™ control system with:
  • Allen-Bradley CompactLogix™ programmable controller
  • Allen-Bradley PanelView Plus CE color touch screen
    o Easy menu-driven format
    o USB printer port
    o Recipe storage book
    o Inventory and material usage information
    o Ethernet communications
    o Digital or Analog Parallelogram Load Cells
    o Up to 16 feeders can be controlled (depends on model)

OR

• C2 control system with:
  • Oberon operating system
  • Color touch screen
    o Easy menu-driven format
    o Serial printer port
    o Recipe storage book
    o Inventory and material usage information
    o OPTIONAL Profibus or Ethernet communications module
    o Digital Vibrating Wire Load Cells
    o Up to 8 feeders can be controlled

• Manual operation capabilities, for emergency use in case of processor failure

Electrical Features

• 220/1/50 or 60 supply voltage
Blender System Component Description

This section describes the various components of the continuous blending system. The continuous blending system is made up of the following components (See Figure 2 below):

- Ingredient supply/re-fill hoppers
- Ingredient weigh hoppers
- Ingredient metering auger assemblies
- Collection hopper or lower mass flow weigh hopper
- PLC Control panel
- Motor drive panel

Figure 2: AccuMeter Blender Assembly

Ingredient Supply/Re-fill Hoppers

The ingredient supply/re-fill hoppers are located on top of the blender frame. Their purpose is to provide a supply of material to the individual ingredient weigh hoppers on demand. The hoppers are equipped with an air-operated discharge valve that is opened by the PLC when a respective weigh hopper needs a re-fill of material. These hoppers are sized to handle the
percentage requirements of the ingredients. Optional level sensors which might exist in these
hoppers are not controlled nor read by the blender. Their existence is solely for the use of a low
level alarm to be wired into a separate controller. These would not be present on a standard
blender.

The hoppers may be equipped with a polycarbonate sight glass. This is mounted in the upper
cone section of the hopper. This is useful for a quick reference of the material level in each
hopper.

The supply/re-fill hoppers should be vented to the atmosphere through the louver located on the
lid of each hopper. This louver is required to prevent the loading system from creating a
vacuum in the hopper, which would prevent material from flowing out properly. This situation
could be caused by a leaking discharge seal on the vacuum receiver.

**Ingredient Weigh Hoppers**

Each ingredient weigh hopper assembly consists of a conical mass flow weigh hopper, a
precision load cell and a discharge tube disc seal. A mass flow weigh hopper is a steep degree
conical hopper with vertical side walls with a discharge tube on the bottom. Each weigh
hopper is sized to the blender ingredient metering requirements. This assembly is responsible
for weighing the material ingredients as they are metered out by the metering auger assemblies
located below each weigh hopper. The manufacturer believes this is the best way to weigh free
flowing pelletized materials. This design allows the hopper to weigh only the material and
nothing else, unlike other systems that weigh the heavy auger assemblies. This design
eliminates extra variables, such as auger drive vibrations, etc. from the weighing system and
increases the load cell resolution. Each weigh hopper will be refilled periodically as material
reaches the preprogrammed low weight setpoint for that hopper. Clear hopper side walls or
sight glasses are provided on each on the weigh hoppers to allow the operator to monitor the
levels.
**Ingredient Metering/Transport Auger Assemblies**

Each metering auger assembly consists of a:

- Cast aluminum motor mount
- Cast aluminum feeder body
- Aluminum feeder tube
- Gearbox
- Inverter-duty AC drive motor or DC PWM Motor
- Machined metering auger

The metering auger assembly accurately meters the material from the ingredient weigh hopper at the calculated rate.

The mass flow weigh hopper design allows more range of the load cell to be used for actually weighing the material and eliminates dynamic drive movement and vibrations from affecting the load cell readings.

**Cascade Material Chute**

The cascade material chute is a rectangular conduit in which all the metering augers discharge. The materials are cascaded together and directed vertically down into the lower mass flow weigh hopper. A clean out door is provided on the chute above the augers, so that any dust can be blown out if it has collected.

**Collection Hopper**

The collection hopper is used when the feeding system is starve feeding the extruder, and the extrusion feed rate is controller by the blender.

The hopper may also include “high” and “low” level switches to cycle the blender based on the extruder process rate.

**“Fixed Rate” mode**

The lower mass flow weigh hopper may be replaced by a collection hopper with “high” and “low “ level switches on higher capacity blenders. This configuration controls the blending system rate.
based on material level rather than material weight. It is also possible to starve feed in this mode without the need for another cross auger below the blender.

**Lower Mass Flow Weigh Hopper Assembly**

The lower mass flow weigh hopper, otherwise known as the weighed common hopper, is used to determine the actual processing rate of the processing machine so that the blender can be slaved in to run at the learned rate. The hopper is constructed of spun aluminum and is of the mass flow type (See the glossary in the Appendix). It is supported by a load cell, and will carry a weight of material depending on how much is flowing into the hopper from the metering augers, and how much is flowing out of the hopper, dictated by the processing rate of the processing machine.

The computer uses the mass flow hopper flow rate (the differential rate), along with the known total rate from the weight loss feeders to determine the actual processing rate of the processing machine. The blender output rate is then adjusted to match the learned processing rate. This method of operation provides very accurate slave in of the blender to the processing rate, and eliminates the need for a mixing hopper.

The lower common weigh hopper is also equipped with a high level proximity level sensor to allow manually adjusted volumetric operation of the blender in the event of computer failure.

**Figure 4: Weigh Hopper Assembly**

*Note:* The lower or common mass flow weigh hopper uses the change in weight over time, of material in the hopper to calculate it’s discharge rate (differential rate). This learned discharge rate is then summed with the known total metering rates of the blender feeders to learn the actual processing rate of the processing machine. The blender output rate is then adjusted to match the learned processing rate, eliminating the need for a blender mixer.
**PLC Control Panel**

The PLC control panel may be mounted on the side of the blender frame, or remote mounted near the blender. It uses an Allen-Bradley CompactLogix programmable controller with standard 24 vdc input output cards. This design provides excellent blender performance along with easily replaceable off-the-shelf parts in case of any electronic component failure.

**Touch Screen Interface**

The PanelView Plus CE color touch screen display is mounted by default in the PLC control panel. It is very user friendly after installation and setup, simply enter in the proper recipe and start the blender.

If it is desired to have the primary display remote mounted consult factory.

**Motor Drive Panel**

The auger motor drive panel is mounted on the blender frame adjacent to the PLC control panel in most applications. The motor drive panel is permanently wired on the blender. The standard panel contains Eaton or KB PWM motor drives, a power supply and manual volumetric backup system wiring components.

The motor drives on the blender are standard, off-the-shelf drives and are readily available from distributors and the manufacturer.

Power cords to each drive motor are equipped with plugs to facilitate auger removal and motor replacement, if necessary.

**Optional “Quick Color Change” Kit**

The optional “QCC” quick color changeover kit allows the virgin material to be gravity fed so the processing machine can be operated, while a color change is being done.

The virgin material auger metering assembly is equipped with a lower slide gate and discharge tube. A flexible hose connects the discharge tube with a cast aluminum flange below the blender that is equipped with an angled inlet tube stub. When the slide gate is opened, virgin pellets will gravity feed to the bottom of the blender and bypass the blender augers and the lower mass flow weigh hopper, allowing the extruder to be operated.

The blender augers can then be removed and the colors changed without the processing machine having to be “re-strung”, and the product having to be re-gauged.
2-4 **Options**  
The following is a list of options, which your blender may have been equipped with:

- **Powder feeders**
- **Digital dosing feeders**
- **Mezzanine stand with slide gate and 4” tube stub.**
- **Supply hopper lids for non-ACS supplied vacuum receivers & loaders.**
- **Agitated, straight wall regrind supply & weigh hoppers for regrind material.**
- **Compressed air loader for low percentage additives.**
- **Ethernet communications (standard with AB controller)**

**Remote Display**

Allows control of blender from a second location up to 300 feet (136 meters) away. The remote display can be located in another location to allow the blender to be operated from that position. The *additional* remote PanelView Plus CE operates identically to the main display.
2-5 Safety Devices and Interlocks
This section includes information on safety devices and procedures that are inherent to the continuous loss-in-weight blender. This manual is not intended to supersede or alter safety standards established by the user of this equipment. Instead, the material contained in this section is recommended to supplement these procedures in order to provide a safer working environment.

At the completion of this section, the operator and maintenance personnel will be able to do the following:

• Identify and locate specific safety devices.
• Understand the proper use of the safety devices provided.
• Describe the function of the safety device.

Safety Circuit Standards
Safety circuits used in industrial systems protect the operator and maintenance personnel from dangerous energy. They also provide a means of locking out or isolating the energy for servicing equipment.

Various agencies have contributed to the establishment of safety standards that apply to the design and manufacture of automated equipment. The Occupational Safety and Health Administration (OSHA) and the Joint Industrial council (JIC) are just a few of the organizations that have joined with the plastics industry to develop safety standards.

Every effort has been made to incorporate these standards into the design of the continuous loss-in-weight blender; however, it is the responsibility of the personnel operating and maintaining the equipment to familiarize themselves with the safety procedures and the proper use of any safety devices.

Fail Safe Operation
If a safety device or circuit should fail, the design must be such that the failure causes a “Safe” condition. As an example, a safety switch must be a normally open switch. The switch must be held closed with the device it is to protect. If the switch fails, it will go to the open condition, tripping out the safety circuit.

At no time should the safety device fail and allow the operation to continue. For example, if a safety switch is guarding a motor, and the safety switch fails, the motor should not be run.

Safety Device Lock-Outs
Some safety devices disconnect electrical energy from a circuit. The safety devices that are used on the continuous loss-in-weight blenders are primarily concerned with electrical power disconnection and the disabling of moving parts that may need to be accessed during the normal operation of the machine.

Some of the safety devices utilize a manual activator. This is the method of initiating the safety lock out. This may be in the form of a plug, disconnect plug, lever or a handle. Within this lockable handle, there may be a location for a padlock. A padlock should be placed in the lockout handle by personnel servicing the equipment.

**WARNING!** *At no time should anyone other than the person who installed the lockout or unplugged a twist plug, remove the lockout, or reconnect the twist plug.*

**Pluggable Line Cord**

This line power cord allows the operator or maintenance personnel to unplug the blending system from its power source and tag it out. This plug may be tagged with any number of approved electrical lockout tags. These tags are available at most electrical supply stores.

**Amphenol quick connect Plug Connected to Each Auger Motor**

The plug must be unlatched and the female end of the cord removed from the motor plug. This disables the motor from turning while the auger unit is being serviced or cleaned. The motor cords are cut to length so they must be disconnected before the auger can be removed from the housing.

*Note: Disconnect both of the items listed above before cleaning or servicing equipment.*

**Figure 5: Plug**

![Plug Diagram](image)

**Caution!** *Disconnect the electrical power and compressed air source before working on the equipment!*

AccuMeter Controller  Chapter 2: Functional Description  22
Chapter 3: Installation

3-1 Uncrating the Equipment
Continuous loss-in-weight blenders are shipped bolted on a skid, enclosed in plastic wrap, and contained in a wood crate.

1. Remove the crate from around blender.
2. Secure strap of proper lifting capacity to the lifting lugs installed in the holes provided.

**Caution!** Use approved safety straps or chains to lift the blender from the eyebolts on the top plate (See figure 6 below for eyebolt positioning).

3. Lift blender until strap is taut.
4. Remove bolts attaching bottom of blender to shipping skid.
5. Raise the blender slowly.

**Figure 6: Lifting Eyebolt Position on Blender**

3-2 Rigging and Placing the Unit
It is the intent of this section to familiarize the reader with the proper site requirements and installation procedures of the continuous loss-in-weight blending system. The information in this section is NOT meant to replace or supersede an established local or company implemented procedures. It is meant to enhance them.

**Note:** The manufacturer assumes NO responsibility for any damages resulting from improper installation, or improper handling during the installation process.
Site Requirements
This section describes site requirements in detail. These requirements are broken down into mechanical mounting, electrical connections and pneumatic connections. Since the continuous loss-in-weight blender is available in several different mounting arrangements, it is necessary for the reader to become familiar with the different arrangements.

Mounting Configuration
The continuous loss-in-weight blender is available in (3) three basic mounting arrangements. They are:

- Machine Mount
- Mezzanine Mount
- Floor Mount

Machine Mount
In a machine mounting application of the continuous loss-in-weight unit, there are a few items to review before placement and mounting of the blending system begins.

First, verify the machine flange dimensions match the continuous loss-in-weight blender flange or the optionally provided adapter flange dimensions.

Verify that the machine material inlet flange is mechanically capable of supporting the weight of the continuous loss-in-weight blender with a full load of material and the loading system installed.

Note: While in operation, the continuous loss-in-weight blender applies horizontal and vertical pressures to the mounting flange. The vacuum system will cause some shaking due to the dynamics of the conveying operation.

Note: If there is a question as to the mechanical stability of a mounting flange, the appropriate reinforcements and lateral supports must be provided to ensure a safe installation. Check to ensure that the unit is braced to prevent swaying if necessary. Contact the manufacturer.

Verify all clearances on the top and beside the processing machine. This is to insure that all motors, hoppers, control panels, etc. have adequate room for proper operation and servicing.

Note: Allow at least 24” clearance around auger assembly to provide adequate room for cleaning, servicing, etc.

Using proper lifting equipment, lift the blender into place above the machine throat and secure the flange bolts. Check to ensure that the unit is properly oriented, and that there is adequate access around the blender for operating and servicing of the panels and cleaning of the feeder units. A work platform with OSHA approved handrails is recommended.

Take care to insure proper orientation with adequate access to operator controls, mix chamber, and metering units.
Note: Never weld on the blender’s frame, machine or mezzanine without first removing the control panel and verifying that the blender’s power is disconnected.

Mezzanine Mount

In a mezzanine mount application, review the following items before installation begins. First, verify the blender mounting locations match the mezzanine supports. Verify that the mezzanine is capable of supporting the blender with a full load of material and loading equipment installed. If the unit is unstable in the vertical or horizontal plane, additional bracing of the mezzanine floor or blender side bracing will be required. Remember that this is a precision weighing system. It is only as accurate as the base it is mounted on.

If a blender is moving due to vibration, the weigh hoppers will tend to remain stationary due to the laws of physics dealing with inertia. This causes the load cells to output erroneous weight signals.

Note: While in operation, the blender applies both horizontal and vertical pressures to the mezzanine mount location.

Second, verify ALL clearances to other equipment and structures. Insure motors, hoppers, and control panels have proper clearance for operation, cleaning and maintenance.

Note: Auger assemblies require a minimum of 24 inches for proper cleaning and maintenance.

Ensure that the blender, if feeding the extruder from an offset (not exactly over the center of the extruder throat), is mounted with the gravity discharge tube at least at a 60 degree angle (See figure 7 below). This must be more than the angle of repose of the material or bridging in the discharge tube will occur and the extruder could starve. The material connection should be made with rigid tubing, if possible.

Figure 7: Offset Mezzanine Mount Position
Note: Ensure that the feed tube angle is steep enough (60 degrees is recommended).

Note: Some mezzanine mount applications will require the blending system’s lower mass flow hopper be mounted on the extruder throat. The metering section will be mounted on a small stand on the mezzanine directly above the extruder with a 4” tube stub for gravity metered flow.

Note: This arrangement will be similar to the floor mounted configuration, discussed in the following section, less the blower assembly.

Using the proper lifting equipment, lift the blender into place. Take care to ensure the proper orientation of the blender and operator controls.

Note: The manufacturer assumes NO responsibility for any damages resulting from improper installation or improper handling during the installation process.

Once properly positioned, securely fasten the blending system to the floor.

Floor Mount

In a floor mounting application, ensure adequate clearance for all blender operations and maintenance. The operator and maintenance personnel must have access to all parts of the blender. If necessary, it is the customer’s responsibility to provide adequate, safe work platforms around the blender to meet state and local safety codes. For specific dimensions, refer to the assembly diagram provided with each blender.

Note: Auger assemblies require a minimum of 24 inches of clearance for proper servicing and cleaning.

Insure the chosen location for the blending system is adequately away from high traffic aisles. Insure that normal day to day operations will not place the blending system at risk of damage.

Once a proper location has been chosen, securely fasten the blender floor stand frame to the floor.

Note: The blending system MUST BE SECURELY LAGGED TO THE FLOOR before operating the unit.

The floor mounted version has a blower and venturi that continually conveys the metered blend to the processing machine mounted mass flow weigh hopper. The blower unit can be placed in any position around the venturi and connected with a flexible hose. It is provided for a straight hook up from the factory, but this can easily be field changed to any convenient location, with additional tubing and a longer wiring conduit. These blenders have been installed with the blower remote from the blender and connected with rigid aluminum tubing, bends and Morris couplers. This is the customer’s preference. All conveying tubing is to be provided by the customer and is not included with the blender pricing.

Note: The manufacturer assumes NO responsibility for any damages resulting from improper installation or improper handling during the installation process.

Figure 8: Typical Layout for a floor mounted blender
3-3 Electrical Installation

The continuous loss-in-weight blending system is designed to operate on 115 volt or 220 volt, single phase, 50 or 60 hertz AC power. The power requirements will vary with the blender’s size and throughput rating. For exact current requirements, check the blender serial number tag, located on the blender motor control panel.

As an added option, the manufacturer may provide a voltage transformer for special supply voltage. If supplied, they are rated for the load required by the blending system - no other equipment should be connected to the transformer. The additional equipment may induce noise into the power circuit to the blender, as well as possibly overload the transformer.

The power transformer wiring and mounting is the responsibility of the customer. If company or local codes require fusing or disconnects, these items must be supplied, wired, and mounted by the customer.

Each blending system MUST be connected to a separate source of power. Do not connect extra equipment on the same line, with or without use of the transformer.

It is the customer’s responsibility to ensure that the power requirements of the blending system are satisfied.
3-4 **Pneumatic Installation**

The blending system utilizes air pneumatics to perform the re-fill function on the ingredient weigh hoppers.

The manufacturer provides all pneumatic plumbing to a single ¼" standard pipe thread fitting. The blender requires a maximum of 60 PSI of compressed air.

It is the customer’s responsibility to ensure that the air is CLEAN, DRY & LUBRICATED. Any component failures due to airborne contaminants will not be subject to warranty consideration.

The working range of the air pressure is from 40-60 PSI. PSI lower than 40 may result in shutoff valve failure. PSI greater than 60 may result in damage to the plunger cones in the re-fill hoppers. A 5 micron filter is recommended.

*Note: It is the customer’s responsibility to provide proper air pressure regulation, filtration, and lubrication devices.*

**Figure 9: Pneumatic Air System**
3-5 Overall Installation (Summary)

This installation procedure should be used as a general guideline for the proper installation steps required to install the continuous loss-in-weight blending system.

1. Visually inspect the extruder or blender mounting location for obstructions.
2. Remove the material supply hopper on the extruder flange.
3. Carefully lift blender into place above the mounting flange on the extruder and fasten the blender to the flange using the extruder flange bolts.

**Note:** Always lift the blender from the eyebolts on the top plate.

4. Mount the weigh hoppers that were shipped in boxes on the crate, to their respective load cells (Don’t forget the plastic dust cover on the bottom of the weigh hopper). Align the discharge tube on the weigh hopper to be centered in the lower frame opening over the feeder assembly. Use caution in tightening the bolts. Adjust the gap to 0.040”.

5. Hook the manual mode level sensor bracket over the lower mass flow weigh hopper on the bottom of the blender. Ensure that the cord is not binding on anything that would affect the accuracy of the weigh hopper.

6. Check the wiring from the load cells to the control panel.

7. Ensure that the motor power cords are connected to each of the metering unit motors.

**Note:** Ensure that the augers on the blender metering units are not bent or damaged in shipping before starting the unit.

8. Connect the control power to the motor control panel.

9. Connect the compressed air piping to the inlet fitting on the top of the blender top frame. Ensure that the air supply is regulated to a maximum of 60 PSI.

**Note:** Ensure that the compressed air is regulated to 60 PSI max.
3-6 **Set-up**
This section will discuss the mechanical setup and control system setup of the continuous loss-in-weight blending system. After reading this section, you should be familiar with the mechanical setup and the electronic control setup of the blending system.

**Load Cell Adjustment**
The mechanical setup of the continuous loss-in-weight blending system involves the adjustment of the weigh hopper load cells (Please refer to the figure below). This figure illustrates the proper adjustment of the load cell mechanical stop bolt. The setting for the positive stop is necessary to prevent the load cell from being “over-ranged” by excessive loading on the weigh hopper. The setting for the load cell stop is forty thousandths of an inch maximum (.040”). This should be set by a feeler thickness gauge with the weigh hopper empty.

If a feeler gauge is not available, the weigh hopper should be filled with the material that is to be blended, and the stop adjusted so there is just a very small gap (a couple of sheets of notebook paper) between the load cell, and the blender base stop. This will allow the load cell to operate without mechanical restrictions and provide an overload safety. To adjust the stop, adjust the screw located on the bottom of the load cell. Adjust the screw up to increase the gap and down to decrease the gap.

*Note: THE WEIGH HOPPER ASSEMBLY MUST BE FREE FROM FRICTION; WITH NO MECHANICAL OBSTRUCTIONS OTHER THAN THE LOAD CELL ITSELF.*

**Figure 10: Load Cell Mechanical Stop Adjustment**
Final Connections

1. Connect the blender to the appropriate power source.

2. Connect the compressed air piping, ensuring that a 5-micron air filter is installed, along with the proper water trap, and lubrication unit, if required. Verify that 60 psi (4.14 bar) of clean, dry compressed air is supplied to the blender.

Note: Again, make sure that proper air supply connections are made to the blender, as dirty, contaminated, wet air can damage blender components and can quickly cause poor performance and accuracy!

Note: Make sure that the blender is supplied with clean, dry, 60 psi (4.14 bar) compressed air.
Chapter 4: Making programming chips

This chapter should be used only if you have a new PLC and/or display that has not been programmed from the factory (new from Allen Bradley). You will need to have acquired a set of programming chips from ACS service or engineering before proceeding. You may also inquire to have the image for these chips emailed to you. This will allow you to purchase chips and a compact flash burner locally.

**Step 1: Creating the chips**

*If you are creating chips you will first need to acquire either 3 compact flash or 1 CompactFlash and 2 SD cards from either Allen Bradley or ones that Allen Bradley supports (refer to AB support for more details if not buying from ACS).*

- 1 CompactFlash or SD card for the DISPLAY FIRMWARE CARD
- 1 CompactFlash or SD card for the DISPLAY PROGRAM CARD
- 1 compact flash card for the PLC PROGRAM CARD

*The older AB PanelView Plus CE units use CompactFlash, while the newer AB PanelView 6 units use SD memory cards. If you have any question of which type you need refer to the AB documentation for the part number located on the back of the display.*

Download the image and then copy the appropriate image to each chip. To assist with some confusion that sometimes happens when making these from an image below are details for each card on what you should see when you “double click” on the icon for the chip under “My Computer” in Windows:

- **DISPLAY FIRMWARE CARD:**
  ![Firmware Upgrade AutoRun](image1)

- **DISPLAY PROGRAM CARD:**
  ![Rockwell Software](image2)

- **PLC PROGRAM CARD:**
  ![Logix](image3)

After you have copied the images to each of the 3 chips then you are ready to program the PLC and Display.
Chapter 5: Programming a New PLCs IP address

The Compact Logix CPU has a built in Ethernet port that is automatically assigned an IP address during the boot up process of the PLC. The default is 192.168.5.103, but can be altered if necessary.

To modify the IP address:

- Login to security from the RECIPE page
- Touch NETWORK SETUP
- Enter in the new IP values and touch SEND CONFIG TO PLC
- This process will take about a minute to complete
- You will then need to modify the PLC SHORTCUT in the display in order to communicate with the new address (the display communicates to the PLC via Ethernet). See instructions on the NETWORK SETUP page below.

![NETWORK SETUP](image)

CAUTION!!!

THIS CANNOT BE UNDONE

This will result in the IP address on your PLC being changed. Doing so may cause the display to loose communications with your blender and prevent you from starting/Stopping/Changing the recipe. The only fix is to reload the PLC program from your backup chips.

DEFAULT:
IP Address 192.168.5.103
Subnet Mask 255.255.255.0
Gateway 192.168.5.1

If you change the IP from default then you must modify the Device Shortcut using DISPLAY CONFIGURATION / PANELVIEW PLUS CONFIGURATION / TERMINAL SETTINGS / NETWORK AND COMMUNICATIONS / RSLINX ENTERPRISE COMMUNICATIONS / ETHERNET BRIDGE. Be sure that under STARTUP OPTIONS you have “REPLACE COMMUNICATIONS“ set to "NO".

SEND CONFIG TO PLC

PLC P Address: [N1 N2 N3 N4]
PLC Subnet Mask: [N1 N2 N3 N4]
PLC Gateway: [N1 N2 N3 N4]

Done
Modifying the PLC shortcut address that is stored in the display

After changing the IP address of the PLC from the default to a custom address you will need to program the shortcut for this PLC that is stored within the touch screen.

- Login to security from the RECIPE page
- Touch DISPLAY CONFIGURATION
- Touch PANELVIEW PLUS CONFIGURATION and wait for the AB terminal settings page to load (about 30 seconds)
- Touch TERMINAL SETTINGS
- Touch NETWORK AND COMMUNICATIONS and ENTER
- Touch RSLINX ENTERPRISE COMMUNICATIONS and ENTER
- Touch ETHERNET BRIDGE and EDIT DEVICE
- Touch DEVICE ADDRESS
- Enter new IP address that you programmed the PLC to and touch ENTER
- Touch OK
- Touch CLOSE
- Touch CLOSE again
- Touch STARTUP OPTIONS and ENTER
- Touch RUN OPTIONS
- Set REPLACE RSLINX ENTERPRISE COMMUNICATIONS to NO
- Touch OK
- Touch OK
- Touch CLOSE
- Touch RUN APPLICATION and you are finished

The next page shows what these pages look like.
Chapter 6:  Programming a New PLC

Programming the PLC is done by using the PLC PROGRAM CARD compact flash card that you made in an earlier chapter.

• Locate the card slot on the PLC and insert the PLC PROGRAM CARD as shown below:

• Next reboot the PLC by turning the power off then on. It is HIGHLY important that you do not remove the power during this step until the RUN, IO, and OK lights are SOLID GREEN. The card contains a firmware upgrade in the case the firmware is different on the CPU you are using. This upgrade can take as long as 5 minutes and if disturbed will “brick” the CPU and will make it useless to you unless you return it back to Allen Bradley for repair.

• After you receive solid green lights on the RUN, IO, and OK lights then remove the carefully remove the card. If you leave the card in it will set the parameters back to default every time the power is cycled. This will prevent the blender from running correctly.

• Keep this card in a safe location for future use.
Chapter 7: Setting the IP Address for the AccuMeter Display

The IP address of the AccuMeter Display is not part of the program and must be configured on a new unit by accessing the terminal settings menu from the PanelView Plus CE. By default you should set it to 192.168.5.104 unless you are tying this unit into your existing plant network (refer to your IT department for details)

1. Touch “Terminal Settings”

2. Scroll down and hit enter at “Network and Communications”
3. Scroll to “Network Connections” and hit the “enter” arrow.

4. Scroll to “Network Adapters”
5. Touch “IP Address”

6. Touch “IP Address” and enter in “192.168.5.104”

7. Hit “enter”, “ok”, then “ok”, then “close”, then “close”, then “close”, then “close”, then “close”, then turn the power off and then back on and allow it to reboot before proceeding.
Chapter 8: Other Settings for the AccuMeter Display Initialization

At this point you should have just rebooted the display. If you are using this section of the manual on a working unit then you will need to access the DISPLAY CONFIGURATION PAGE by logging in as a SUPERVISOR and then touch the ACS icon, then Display Configuration, then PANELVIEW PLUS CE CONFIGURATION to get here.

1. Touch “Terminal Settings”,

2. Select “Display” and then hit the enter arrow
3. From this page go under Cursor and disable the Cursor. Then go under Screen Saver and disable the screen saver. Using a screen saver is a customer option and will increase the life of the display dramatically. When finished hit CLOSE to go back to the Terminal Settings page.

4. From the terminal settings page you can access the Time/Date/Regional Settings page to setup these items. They are used for alarm date/time info.
Chapter 9: Programming the display from the Flash Card.

First insert the DISPLAY PROGRAM CARD into the slot on the back of the display as shown below:

Older Style AB Display using CompactFlash

Newer Style AB Display using SD Memory Card
Touch “Load Application”

Touch Source until it shows “External Storage 1” and click “Load”
You will be prompted with the following screen. You need to click “yes”. If you are tying this unit into your existing plant network then you must still click yes initially, then you must repeat this loading process and select “no” the second time. This will allow you to go under the RS View Communications setup and program the PLC’s device shortcut according to your scheme. Refer to ACS engineering for more details on this procedure.

After doing this you will need to go to “startup options” and select “Run Current Application” as mentioned next.

1. Touch “Terminal Settings”
2. Scroll to “Startup Options” and hit enter.

3. Hit enter again here.
4. Select “Run Current Application”. If this is disabled you have not loaded the display program yet and need to review the previous steps.
5. Click OK when you see the screen below. This step is what tells the display to always load the program from the chip. **THE CHIP WILL REMAIN IN THE DISPLAY ALWAYS.**

Keep touching “OK” until you are back to the original page. At this point reboot the display after connecting it via a cross over cable to the PLC and you should see the following screen without question marks after “PLC VERSION” (question marks mean that it is not communicating with the PLC)
Chapter 10: Printer setup for PanelView Plus CE

From the VersaView config screen touch Terminal Settings.
Then scroll to “Print Setup” and hit “enter”

Scroll to Display Print Setup and hit enter
Setup the printer from this page

Advanced Settings Shown Below

FOR A COMPLETE LIST OF COMPATIBLE PRINTERS REFER TO YOUR LOCAL ALLEN BRADLEY DISTRIBUTOR OR THE ALLEN BRADLEY WEBSITE
Chapter 11: Configuring a new PLC

This chapter should be used only if you are either upgrading a blender’s controls from a C2, Covis, or OL controller. You can also use this chapter as a guide to configuring a new PLC. This chapter does not cover the actual programming of a blank PLC (that is covered in Chapter 6).

This chapter details every parameter for an AccuMeter system, but assumes that both the Display and PLC are programmed and communicating.

**Step 1: Login to the Controller as the “SUPERVISOR”**

- From the main page touch “LOGIN” to bring up the login page.
- Touch “User” and enter “SUPERVISOR” and hit enter.
- Touch “Password” and enter “3145348” and hit enter.
- Touch the return arrow to complete the login process. You will not receive notification for success or failure.
Step 2: Enabling the I/O cards and Digital Loadcell Interfaces of the PLC

- By default in the program all of the I/O cards are disabled. This allows you to use the same program on multiple different platforms that all use different cards.

- After logging in as the SUPERVISOR touch the ACS icon from the main recipe page to bring up the SETUP DIRECTORY.

- Once you are in the SETUP DIRECTORY touch the ACS icon again to enter in the ACS ENGINEERING ONLY DIRECTORY.
From the ACS ENGINEERING ONLY DIRECTORY touch IO CARD SLOT CONFIGURATION

- Open the PLC panel and observe which cards are present. Set each slot that is present to “ENABLED” by touching the slot’s box. Be sure to use caution while doing this. If you make a mistake then the PLC will fault and you will need to reboot the PLC and start this step over. Unlike earlier versions you will not loose all of the other settings when this happens.

- You should also notice that after you are finished that all of the “OK” lights on the I/O cards are solid green and not flashing. On some CompactLogix units it is necessary to rotate the key on the PLC to “Program”, then “RUN”, then “Program”, and then “Run” in order for the IO change to be accepted. Hit done to go back to the ACS ENGINEERING ONLY page to continue.
DIGITAL LOADCELL INTERFACE SETUP *(Accessed from ACS ENGINEERING ONLY DIRECTORY)*

**CAUTION!!!! ONLY DO WITH BLENDER STOPPED!!!!!!**
The AccuMeter can use either analog parallelogram loadcells or Rinstrum Digital Loadcell interfaces in conjunction with analog parallelogram loadcells. It should be made clear that ALL loadcells are analog physically. Some loadcells are referred to as “digital loadcells”, but this just means the analog-to-digital converter is mounted on the loadcell.

Accumeters have an analog-to-digital converter card (1769-IT6) that is a 16-bit card that is capable of a resolution of about 30,000 parts. This is very accurate and is satisfactory for all feeders where the motor is not being weighed by the loadcell. However, when using feeders (such as powder feeders) that have the motor weighed by the loadcell this only allows feeding down to about 10 lbs/hr. For these systems we have a Digital Loadcell Interface that is a 24-bit converter. This produces internal resolutions near 16,000,000 parts. This produces a resolution that is higher than the traditional European Vibrating wire loadcells that have a resolution of 1,000,000 parts.

Adding the Rinstrum modules to an existing system is very simple.
- 1 Rinstrum COM module is required per blender (Rinstrum T105, 724.00929.00)
- 1 Rinstrum Digital Loadcell Interface board is required per feeder and mass flow (Rinstrum T610, 724.00930.00)
- Both of these are DIN rail mounted inside the PLC panel (or remotely), the T105 COM board gets wired into the 24VDC supply.
- The T105 COM board is connected to the first T610 with a small CAT5 cable, then to the next with another small CAT5 cable, and the last T610 will have a Terminating CAT5 plug in the open CAT5 slot.
- Connect the T105 COM board to the PLCs RS232 port using a standard straight through DB9M-DB9F cable.
- Wire the loadcells into each T610 module and follow the instructions on programming the modules on the next page.
Configuring un-programmed modules is very simple:

- After connecting the modules you will see on the DIGITAL LOADCELL SETUP page, which devices are communicating with the PLC. This is automatic.
- Touch the PRESS TO PROGRAM ALL CONNECTED DIGITAL LOADCELLS button.
- This will program all modules the same. If you want to modify the settings you can change the values on this page, but it is NOT RECOMMENDED.
- In the unusual case that one Digital Loadcell Interface is to be programmed differently than the others then you must only connect the single unique device before pressing the PROGRAM BUTTON.
- AUTOMATIC REFRESH ENABLED is used to automatically pull all of the devices configurations all of the time. This slows down communications, but doesn’t have an overall effect on accuracy. We recommend leaving it on, but it is here for the unusual case.
- After setting up the loadcell modules then they are now ready to be selected under the SCALE CALIBRATION page for either a feeder or a massflow hopper.
Step 3: Assigning Feeders to the Blenders *(Accessed from ACS ENGINEERING ONLY DIRECTORY)*

CAUTION!!!! ONLY DO WITH BLENDER STOPPED!!!!!!

The number of feeders that can be controlled by an Accumeter controller depends on the IO that you have purchased with your system (see previous IO description section). The software is configurable for up to 16 feeders, so to upgrade from a 4 feeder system to an 8 you just add in the appropriate cards, wire them according to print, and then enable them under Enable IO Slots.

Accumeter can control individual feeders or they can be tied together as blender. The easiest way to configure a system is to use the AUTOMATIC FEEDER ASSIGNMENTS page.

**STEPS TO USE AUTOMATIC FEEDER ASSIGNMENTS PAGE:**

1. Enable the number of blenders you want by checking the box. It doesn’t matter which order your select them in.
2. Enter the number of feeders for each of the enabled blenders.
3. Touch “AUTO CONFIG NOW” and Accumeter will figure out the rest. The feeders (A-P) along with massflow hoppers (Analog 1-6) will be automatically assigned. If you are using Digital Loadcells then you will need to go under the Massflow popup page, under CALIBRATE SCALE, and select the DIGITAL LOADCELL INTERFACE you will be using for that massflow.
4. If you don’t follow the RULES shown in the upper right side then you will be given a RED error message and you won’t be able to autoconfigure.
CAUTION!!!! ONLY DO WITH BLENDER STOPPED!!!!!!

In some cases customers may want to manually configure the feeders to specific blenders. This can be done under the MANUAL FEEDER BLENDER ASSIGNMENTS page (also accessed from the ACS ENGINEERING ONLY menu).

**STEPS TO USE THE MANUAL FEEDER BLENDER ASSIGNMENTS PAGE:**

1. Enable the appropriate number of feeders you have on your system using the checkbox next to each feeder. **DO THIS ALPHABETICALLY AND DO NOT SKIP ANY or it will make wiring the system confusing.**

2. Select the blender position you want each assigned to. Blender positions are shown on a mini screen on this page. The maximum feeders per position is shown in the upper right. Assign blenders in order as shown. For instance don't assign Feeder A, C, and D to blender 2 while assigning Feeder B and E to blender 3. This will make wiring the system difficult.

3. As you assign feeders you will see on the mini screen what the result will look like. You will find that some positions will overlap. If you find your selection overlapping use a different combination. If you have trouble figuring out what combo to use then you should use the AUTOMATIC FEEDER ASSIGNMENTS page since it does it perfect every time.
Step 4: Items on the SETUP DIRECTORY

- Use the UNITS page to change from Metric to Imperial. If this is changed then you will need to reconfigure all weight settings, recalibrate all loadcells, and recalibrate all feeders.

- You can also modify the password for the current level under PASSWORDS

- Access the DISPLAY CONFIGURATION page to observe the software version in both the display and the PLC. This page also gives you access to the display’s main configuration page that will be discussed later in Chapter 6. The DISPLAY VERSION and the PLC VERSION should always match. If they do not then you will receive SOFTWARE VERSION CONFLICT message.

- NETWORK SETUP is used to program the PLC’s IP Address

- The ALARM LOG can also be accessed to view and print alarms for all feeders.
• When you are finished touch DONE to go back to the main recipe page.
**Step 5: Feeder Configuration Settings**

Once you have configured the SETUP and ACS ENGINEERING ONLY settings then you must configure each feeder appropriately based on the physical equipment.

Start by touching the icon for the feeder from the main recipe page.

This will bring up the FEEDER POPUP page that will allow you to configure all of the feeders settings.
FEEDER SETUP Tab

• DISPLAYED NAME for the feeder as it appears throughout the controller. The electrical documentation refer to them as FEEDER A-L regardless of the label here.

• Change the GRAPHIC that is used to represent the hopper by touching the small graphic icon.

• Modify the HOPPER SIZE. This is the value that the system will fill the hopper to during refill. This should be set to prevent overfill regardless of the bulk density of the wide variety of materials you may use in this feeder. If set too large then the reload valve will remain open and the hopper will become volumetric. This is a useful trick if you are having a load cell problem and want to be able to continue running without a load cell. You would also have to disable the RELOAD TOO LONG ALARM (Alarm Setup Tab).

A guide line is shown below:

<table>
<thead>
<tr>
<th>Hopper Diameter (inches)</th>
<th>Approximate Hopper Capacity (@35 lbs. / cu. ft.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>7</td>
</tr>
<tr>
<td>12</td>
<td>14</td>
</tr>
<tr>
<td>14</td>
<td>18</td>
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<td>40</td>
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<td>24</td>
<td>60</td>
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</tbody>
</table>

• Modify the MAX MOTOR SPEED. This can be set to whatever scale you wish to use. If you have an AC drive that displays the frequency in HZ then set this to the max HZ. If you have a DC PWM drive and you want it to match the actual maximum RPM of the motor then refer to the name plate on the motor and set it accordingly. Whatever you set this to will only effect the manually inputted speed control. However, do not make changes to these settings while you are running or unexpected results may occur.

• RELOAD % is the percent of hopper weight that triggers a refill to occur. This value can be changed, but refilling too often will greatly reduce the accuracy of a gravimetric feeder.

• EMPTY% is the percent of hopper that is viewed as being out of material. Leaving some material in the hopper prevents deviations in scale calibration from appearing like material when the hopper is actually empty. This should not need to be changed
• MIN/MAX SPEED% are the limits at which the controller allow the drives to run and are used to determine the MIN/MAX blend rate for any given recipe. It is important that these limitations be set appropriately for the given motor/drive technology. Refer to service before changing.

• REFILL SETTLE TIME (SECONDS) is the amount of time that the controller will weight for the hopper to settle after a refill before looking at the weight. Setting this value too small can cause erroneous results.

• ENCODER CIRCUIT ENABLED/DISABLED is used to specify if you are using closed loop feedback on this feeder. This could be an encoder or other pickup source.

• ENCODER PPR is the pulses per revolution of the encoder. Set this according to your encoder documentation. Refer to the factory for assistance in determining this if it is not clearly stated.

• MAX SCALED MOTOR SPEED is the scale range you wish to be shown on the screen. This is not recalculated, but is user specified.

• MAX PHYSICAL MOTOR SPEED is the max physical RPM of the feeder. This is user specified and not recalculated by AUTOTUNE.

• MAX OUTPUT VOLTS is the maximum volts required to get to the MAX PHYSICAL MOTOR SPEED. This is user specified, but is automatically recalculated if an encoder exist and AUTOTUNE MAX VOLTS is enabled. If this number is varying greatly over the range of the feeder then the feeder drive is not linear and should be adjusted.

• AUTOTUNE MAX VOLTS if enabled with the use of an encoder will automatically calculate the MAX OUTPUT VOLTS required to achieve the MAX PHYSICAL MOTOR SPEED.
• NO FLOW ALARM ENABLED/DISABLED. This alarm occurs if the feeder is running and the system does not detect weight loss. This could happen if there was a material bridge in the hopper. RUN on alarm means that you want the blender to continue running regardless of this condition. STOP on alarm means that you want the blender to shutdown if this condition is detected.

• NO FLOW TIME (SECONDS). This is the sample window that is used in determining if a no flow condition occurs. A weigh snapshot is taken every X seconds and the change in weight bits is compared with the NO FLOW BITS setting. Making the time too small will cause nuisance alarms. Making it too long will delay you receiving the alarm, but will generally not cause a problem. Default is 30 seconds, but should be increased on very low rate hoppers.

• NO FLOW BITS. This is the number of weight bits that the system must see change over the NO FLOW TIME (SECONDS) or the system will generate a NO FLOW ALARM. Making this number too big will cause nuisance alarms. Making this number too small will prevent the alarm from ever occurring and basically disables the alarm. Default is 20.

• RELOAD TOO LONG ALARM ENABLED/DISABLED. This alarm occurs if it takes more than 30 seconds to reload the weigh hopper.

• NO MATERIAL ALARM ENABLED/DISABLED. This alarm occurs whenever the hopper weight is below the EMPTY % (Feeder Setup page). There is a 30 second delay after first starting the blender to allow the system to prime.

• LOADCELL ALARM ENABLED/DISABLED. This alarm occurs if either the loadcell is disconnected or is mechanically negative sprung (reading negative). If you disconnect a loadcell the CURRENT BITS (Calibrate Scale page) will go to 32767. This alarm will not detect a non-linear or damaged loadcell and is not intended to replace standard scale calibration and testing procedures.
CALIBRATE SCALE Tab

- CALIBRATION WEIGHT VALUE. This is the weight that was used during the last scale calibration. This can be changed just by entering in a new value.

- ZERO BITS. This is the stored value in bits that was recorded when the hopper was empty during the last scale calibration.

- CAL BITS. This is the stored value in bits that was recorded when the calibration weight was hung on the hopper during the last calibration.

- SET “Zero bits”. Touch this button after emptying the hopper to record the ZERO BITS.

- SET “Cal bits”. Touch this button after you hang the calibration weight on the hopper to record the CAL BITS.

- CURRENT BITS. Displays the current measured bits of the loadcell input. The max value is 32767

- CURRENT WEIGHT BASED ON CALIBRATION. Displays the current weight based on the CURRENT BITS, ZERO BITS, CAL BITS, AND CALIBRATION WEIGHT VALUE.

- DIGITAL LOADCELL INTERFACE NUMBER. If set to “0” (disable) then the standard analog loadcell input will be assigned based on your feeder assignment. Here you can select an available Digital loadcell interface for increased accuracy.

- NOTE ON CALIBRATING: You can modify any of these values at any time by simply entering new values. This is useful after a software upgrade so that you don’t have to recalibrate each hopper. Also during a calibration you do not have to do STEP 1 before STEP 2, but the hopper must be empty (no material) for both steps. Also you can manually enter the recorded bits by observing the CURRENT BITS and then entering it into each cell if desired, but should not ever need to be used.
CALIBRATE FEEDER Tab

- **MOTOR SPEED FOR CALIBRATION.** This is the speed at which the motor will be run during the feeder calibration. Ideally it should be set at a value close to what the motor will be running during blender operation. In some cases this is too slow and causes the feed calibration to take significant time.

- **DISPENSE WEIGHT FOR CALIBRATION.** This is the amount of weight that the system will dispense during the feeder calibration. If set too small then the MEASURED FEED FACTOR will be erroneous. If too large then it will take too long to run the feeder calibration. This should be set according to the rate and hopper size.

- **MEASURED FEED FACTOR.** This is the value that is determined by the feeder calibration procedure. This value is literally LBS/HR per MOTOR SPEED (or KGS/HR per MOTOR SPEED). This value in conjunction with MIN/MAX SPEED % (Feeder Setup Tab) is used to calculate the CALCULATED RANGE of the feeder.

- **CALCULATED RANGE.** This is the acceptable metering range of the feeder with the given material. This is used in determining whether a recipe can be ran or not.

- **NOTE ON FEEDER CALIBRATION.** The feeder calibration is the learned relationship between speed and weighed output. It is dependent on the material, auger size, and the gearbox ratio. This value is constantly updated by the system. The time required for the blender while running to develop this relationship initially is dependent on the hopper size and the target rate of the feeder. If the rate is low then the initial update may take considerable time and therefore you may be making bad product until the relationship has been learned. If you switch materials that have significantly different bulk density then you should perform a feeder calibration or if you know it you can simply enter in the MEASURED FEED FACTOR. To perform a feed calibration you just touch PRESS HERE TO BEGIN. First it fills the hopper and primes the feeder by running the feeder at the PRIMING SPEED for a few seconds (PRIMING SECONDS). After which the speed drops to the MOTOR SPEED FOR CALIBRATION and a weight snapshot is taken. When the DISPENSE WEIGHT FOR CALIBRATION passes then it shuts off and calculates the MEASURED FEED FACTOR.
**FIFO SETUP Tab**

- **SAMPLE SIZE IN %**: This is the percent of hopper that is sampled for the data point entered into the FIFO. Making this number smaller makes the system respond more quickly. Making this number too small will induce unwanted error in the algorithm. Making this number larger will delay the samples and dampen the controller.

- **NUMBER OF POINTS IN FIFO**: The number of samples that will be analyzed by the FIFO algorithm to determine if the feeder’s weight loss is steady. Decreasing this number will make the system respond more quickly, but too small may cause erratic behavior. Making this number larger will dampen the controller.

- **ALLOWABLE % DIFFERENCE FOR STEADY**: The % difference is calculated based on this FIFO. If the calculated % difference is less than the ALLOWABLE % DIFFERENCE FOR STEADY then a Steady Flag is given. Making this number larger will allow the system to respond to larger errors. Making it too large will cause erratic behavior. Making it too small will cause the system to become volumetric ignoring the load cell weight loss.

- **MAX ALLOWED FEED FACTOR**: If the instant sample and motor speed calculate a Feed Factor that is larger than this value then a “0” is entered into the FIFO for that sample. This value should be set to a value that is 2-3 times the MEASURED FEED FACTOR (Calibrate Feeder Tab) after the blender has ran for some time. Setting this prevents the operator from causing problems by draining the hopper out the drain shoot while the motor and blender are running.

- **ERROR CORRECTION GAIN (0-100%)**: If set to 100% then the system will correct the motor speed as needed. If set to 50% then only half of the correction is allowed per update. This is useful for preventing Accumeter from making large changes to speed.

- **NOTE ON THE FIFO SETUP**: The FIFO is a well tested algorithm that has been used by ACS for many years. Before modifying any of these parameters it is recommended that you talk to an ACS service or engineer. Setting these values inappropriately can cause significant errors in accuracy. Set correctly the FIFO algorithm makes your system impervious to operator interference caused by touching the weigh hopper and vibration.
**FIFO DATA Tab**

- **PRIMARY FIFO.** This is the primary FIFO that contains up to 20 slots that is used in the analysis of the weight loss. This FIFO will be filled to the NUMBER OF POINTS IN FIFO (FIFO Setup Tab). Once this happens the range of these values is used to calculate a %Dif that is displayed below the FIFO. If the %Dif is below the ALLOWABLE % DIFFERENCE FOR STEADY (FIFO Setup Tab) then the FIFO STEADY message will be shown below the FIFO.

- **SECONDARY FIFO.** This FIFO is used when an erroneous sample is measured by the weight loss algorithm. If the %error of the current sample is greater than the ALLOWABLE % DIFFERENCE FOR STEADY (FIFO Setup Tab) then the sample is entered into the SECONDARY FIFO. If after many samples the SECONDARY FIFO is full based on NUMBER OF POINTS IN FIFO (FIFO Setup Tab) and the %Dif of the SECONDARY FIFO is lower than the ALLOWABLE % DIFFERENCE FOR STEADY (FIFO Setup Tab) then the average of this FIFO is used to fill the PRIMARY FIFO. This would sequence of events would happen whenever you switch to a resin with a significantly different bulk density in the middle of a run without performing a feeder calibration. Normally the SECONDARY FIFO is a means to collect a random erroneous measurement without knocking the PRIMARY FIFO out of steady. This allows you to use a significant number of points where in the older FIFO OL method you would have trouble with a random nuisance event knocking the FIFO out of steady.

- **NOTE ON FIFO DATA PAGE.** This page is normally not used and only comes in to play when diagnosing a problem or to verify that a new installation was working correctly.
NOTE ON TREND DATA. This tab is used to monitor the measured hopper weight. You must keep this tab FEEDER POPUP window up to log data. It is useful to see if something is intermittently interfering with the loadcell circuit. At this time it is not a long term data acquisition tool, but only used for troubleshooting.
Step 6: Massflow Hopper Configuration Settings

Once you have configured the SETUP and ACS ENGINEERING ONLY settings then you must configure each feeder appropriately based on the physical equipment.

Start by touching the icon for the hopper from the main recipe page.

This will bring up the MASSFLOW POPUP page that will allow you to configure all of the massflow settings.
HOPPER SETUP Tab

- **DISPLAYED NAME.** This is displayed above the blender on the main recipe page and on the top of every “pop-up” page to tell you which piece of equipment you are on.

- **MASS FLOW HOPPER ENABLED/DISABLED.** Set the to enabled if you have a weighed mass flow hopper. If you are either using a central non-weighed collection hopper with 2 prox switches (high/low) or are starve feeding a process without any collection hopper then DISABLE this. If DISABLEd then all other settings or pages mentioned after this point do not have any effect.

- **HOPPER SIZE.** Set this to about 75% of what the hopper will actually hold in weight. Be sure to take into consideration the lightest bulk density of material that you will be running in the hopper. Setting this too large will cause the blender to overfill the mass flow hopper and will back the resin up into the feeder tubes causing the drives to overload and trip out. Setting this too small will cause the blender to hunt and search instead of locking into the process rate.

- **RELOAD %.** The percent at which the feeders will turn on to fill the mass flow hopper. This value should be set to 50%, but can be lowered if the process rate is physically too high for the size of the mass flow hopper and can be increased if the process rate is significantly lower than what the mass flow is sized for. Consult ACS service or engineering before changing.

- **EMPTY %.** The percent of the hopper determined to be empty. Leaving it at the default 2% will prevent variations in the scale calibration from falsely appearing as resin. This should not be changed.

- **STEADY WINDOW SIZE IN %**. The blender will try to stay within a percent of weight around the median point between the Hopper Size Weight and the Reload %. If it is within this window then it is considered “In Steady Window” and then begins calculating process rate once all of the feeders have their “steady flags” engaged. Increasing this value will allow for more variations in bulk density and is necessary when blending post consumer scrap or high percentages of varying bulk density flake regrind. However, setting this value larger will cause a larger displayed variation in the extrusion process rate. This should be taken into consideration if you are using this data for closed loop extrusion control.
ALARM PAGE Tab

- NO FLOW ALARM ENABLED/DISABLED. This alarm is generated if the blender is running and the extruder is not taking material away. This could happen if a bridge forms directly over the feed throat.

- NO FLOW TIME (SECONDS). This is the sample time that is used to determine if a NO FLOW condition exist. Entering “0” will disable the alarm.

- NO FLOW BITS. This is the number of weight bits that must pass during the NO FLOW TIME (SECONDS) in order for the system to determine that there is flow.

- CANNOT ACHIEVE RATE ALARM ENABLED/DISABLED. This alarm should remain disabled and will be removed in future versions. The NO MATERIAL alarm will supersede this alarm.

- NO MATERIAL ALARM ENABLED/DISABLED. This alarm is generated if the mass flow’s weight is every below the EMPTY % (Hopper Setup Tab). When you first start the blender there is a 30 second delay to allow the blender to get primed.

- LOADCELL ALARM ENABLED/DISABLED. This alarm occurs if either the loadcell is disconnected or is mechanically negative sprung (reading negative). If you disconnect a loadcell the CURRENT BITS (Calibrate Scale page) will go to 32767. This alarm will not detect a non-linear or damaged loadcell and is not intended to replace standard scale calibration and testing procedures.
• CALIBRATION WEIGHT VALUE. This is the weight that was used during the last scale calibration. This can be changed just by entering in a new value.

• ZERO BITS. This is the stored value in bits that was recorded when the hopper was empty during the last scale calibration.

• CAL BITS. This is the stored value in bits that was recorded when the calibration weight was hung on the hopper during the last calibration.

• SET “Zero bits”. Touch this button after emptying the hopper to record the ZERO BITS.

• SET “Cal bits”. Touch this button after you hang the calibration weight on the hopper to record the CAL BITS.

• CURRENT BITS. Displays the current measured bits of the loadcell input. The max value is 32767

• CURRENT WEIGHT BASED ON CALIBRATION. Displays the current weight based on the CURRENT BITS, ZERO BITS, CAL BITS, AND CALIBRATION WEIGHT VALUE.

• ANALOG MASSFLOW NUMBER (1-6) is used to assign a particular massflow analog input to the blender. Each Accumeter can have up to 6 analog mass flow hopper inputs. This setting is ignored if the DIGITAL LOADCELL INTERFACE NUMBER is set to anything other than “0”

• DIGITAL LOADCELL INTERFACE NUMBER (0=USE ANALOG) is used to assign an available digital loadcell interface for increased accuracy.

• NOTE ON CALIBRATING: You can modify any of these values at any time by simply entering new values. This is useful after a software upgrade so that you don’t have to recalibrate each hopper. Also during a calibration you do not have to do STEP 1 before STEP 2, but the hopper must be empty (no material) for both steps. Also you can manually enter in the recorded bits by observing the CURRENT BITS and then entering it into each cell if desired, but should not ever need to be used.
• PID UPDATE TIME. This is the rate at which the PID will make corrections to the target blend rate to attempt to maintain the weight at the median point between the RELOAD % (Hopper Setup Tab) and the HOPPER SIZE value (Hopper Setup Tab). Setting this value smaller will allow the blender to react quicker to changes in the bulk density of the material. Setting it too low will cause the control to become under damped and out of control. This condition is obvious because the blender will appear to chase up and down and will never settle into a target. Making the value too large will cause the blender to hit high level or reload and will prevent it from staying between these values. This condition is also obvious because the blender will not stay running, but will not be showing “FIXED RATE” indication on the main page. Default is 5 and should not be changed without consulting ACS service or engineering.

• PID GAIN. This is the gain value that affects the proportional error correction characteristic of the PID. Setting this too large will cause a condition similar to setting the PID UPDATE TIME too low and will cause it to become under damped. Setting it too low will cause a condition similar to setting the PID UPDATE TIME too high. This value primarily effects how large of a correction is made that is proportional to the current error. Default is 15 and should not be changed without consulting ACS service or engineering.

• PID INTEGRAL CONSTANT. This is the multiplier for the integral error correction characteristic of the PID. This setting reacts the same as the PID GAIN setting. However, this correction is not related to the current error, but is dependent on the total for the last several errors. Default is 10 and should not be changed without consulting ACS service or engineering.

• INITIAL RATE. Each time that the blender fills the mass flow hopper up it shuts off and settles for 5 seconds and then will not turn back on until the mass flow weight reaches the top of the upper steady window. At that time the Initial Rate is locked in and this is the value that the PID starts with. It quickly makes a correction to reach the median. If the INITIAL RATE is far from what the actual extrusion rate is then the Mass Flow hopper is out of calibration or being interfered mechanically.
FIFO SETUP Tab

- **SAMPLE TIME ONCE IN STEADY WINDOW.** Once the blender achieves “In Steady Window” then it begins to calculate the extrusion process rate at this sample interval. Setting this value too fast can add error to the process rate data. Default is 10 seconds.

- **NUMBER OF POINTS IN FIFO.** Number of samples based on above interval that are analyzed by the FIFO algorithm. Increasing this value can smooth out the result.

- **ALLOWABLE % DIFFERENCE FOR STEADY.** If the percent difference of all samples in the FIFO are within this tolerance then the FIFO is considered steady. If this value is set too small then you may never get a steady flag for the blender and therefore will not get a process rate. If it is set too large then you may have unwanted error in the calculated process rate.

- **MAX ALLOWED BLEND RATE.** This serves 2 functions. It prevents erroneous process rate calculations caused by an operator draining the blender without shutting it off first and it also prevents the blender from running at a rate higher than this value. This is useful if you have augers that cannot run low enough to match the rate. You can set this to a value just above the true process rate and therefore the augers will run for a long time before shutting off. You should order the correct augers to get the blender to lock into the process rate.

- **TIME REQUIRED IN STEADY WINDOW FOR STEADY WTP FLAG.** The blender must be able to stay in the steady window on the mass flow hopper for this amount of time before it is considered stable. Decreasing this value may cause unwanted error in the calculation.
• PRIMARY FIFO. This is the primary FIFO that contains up to 20 slots that is used in the analysis of the weight loss. This FIFO will be filled to the NUMBER OF POINTS IN FIFO (FIFO Setup Tab). Once this happens the range of these values is used to calculate a %Dif that is displayed below the FIFO. If the %Dif is below the ALLOWABLE % DIFFERENCE FOR STEADY (FIFO Setup Tab) then the FIFO STEADY message will be shown below the FIFO.

• SECONDARY FIFO. This FIFO is used when an erroneous sample is measured by the weight loss algorithm. If the %error of the current sample is greater than the ALLOWABLE % DIFFERENCE FOR STEADY (FIFO Setup Tab) then the sample is entered into the SECONDARY FIFO. If after many samples the SECONDARY FIFO is full based on NUMBER OF POINTS IN FIFO (FIFO Setup Tab) and the %Dif of the SECONDARY FIFO is lower than the ALLOWABLE % DIFFERENCE FOR STEADY (FIFO Setup Tab) then the average of this FIFO is used to fill the PRIMARY FIFO. This would sequence of events would happen whenever you switch to a resin with a significantly different bulk density in the middle of a run without performing a feeder calibration. Normally the SECONDARY FIFO is a means to collect a random erroneous measurement without knocking the PRIMARY FIFO out of steady. This allows you to use a significant number of points where in the older FIFO OL method you would have trouble with a random nuisance event knocking the FIFO out of steady.

• NOTE ON FIFO DATA PAGE. This page is normally not used and only comes in to play when diagnosing a problem or to verify that a new installation was working correctly.
TREND DATA Tab

![Trend Data Chart]

- NOTE ON TREND DATA. This chart allows you to visually see how the PID is reacting to the changes in the mass flow weight. You must leave the pop-up visible in order to track it and is not intended to be a long term data acquisition chart. The Green is the Blender Target Rate while the Blue is the Mass Flow Weight. This page is only used in the initial setup of the blender and for troubleshooting.

**Step 7: Finishing the upgrade**

After you have properly completed all parameters in this chapter proceed to the next chapter for the “Quick Startup”.
Chapter 12: Quick Startup and Calibration

This section describes the quick startup for a blender and controller that has been factory programmed, mounted, and configured on a new unit.

Do not use this section if you are upgrading to the AccuMeter Control Logix platform from either a C2, Covis, or OL controller. For retrofits refer to the Detailed Configuration Parameters chapter.

Do not use this section if you are starting with a PLC or Display that has not yet been programmed. Refer to the Initial Programming section for new PLCs or Displays.

Step 1: Basic Installation (skip to Step 2 if blender is already installed)

- Remove the blender from the shipping crate and mount unit on either mezzanine, feed throat of machine, or blender stand based on application. Be sure to allow adequate room around entire blender to allow removal of auger feeders. Also be sure to allow adequate overhead room to accommodate vacuum receivers.

- In some cases the blenders Drive Panels will need to be mounted near blender with enough clearance to remove augers. This is only on larger blenders. Most blenders have the Drive Panel and PLC panel factory mounted to the blender frame.

- The weigh hoppers and/or feeders (depending on application) are shipped separate from the load cells and blender. Locate these hoppers/feeder and mount each labeled hopper/feeder to the appropriate location designated by a label.

- Plumb 60 PSI clean dry air to manifold on blender. You will need to provide a regulator and any air treatment devices.

- Mount vacuum receivers to supply hoppers. No electrical interface between the blender and vacuum system needed. The blender has it’s own reload section that will reload the weigh hoppers as needed from the supply hoppers that the vacuum hoppers are mounted to.

- Wire appropriate power source to each drive panel in accordance with electrical schematic. In most cases this is the only power connection required. In some cases a separate power source will be required for the PLC panel. Refer to the electrical schematic for specifics.
Step 2: Login to the Controller as the “OPERATOR”

- From the main page touch “LOGIN” to bring up the login page

- Touch “User” and enter “OPERATOR” and hit enter.
- Touch “Password” and enter “5413” and hit enter
- Touch the return arrow to complete the login process. You will not receive notification for success or failure.
- Be sure that when you are finished calibrating the blender that you touch the “LOGOUT” button.
Step 3: Calibrate each loadcell

- After logging in touch the icon for the feeder.

- Touch the “Calibrate Scale” tab.

- Locate the calibration weight listed here.

- Empty hopper and then touch “SET Zero Bits”.

- Hang calibration weight from hopper and touch “SET Cal Bits”.

- Repeat this for all hoppers that have loadcells.
**Step 4: Calibrate each feeders**

- It is necessary to perform a feeder calibration with material to initialize the feed algorithm. The controller will automatically determine this, but by doing so you decrease the amount of learn time required. It is easy to perform and is recommended that every time you switch resins with significantly different weights and flow values that you run a feeder calibration.

- From the popup page touch the “Calibrate Feeders” tab

- Turn on the vacuum system and convey material or hand fill material into each supply bin above weigh hopper. You will need enough material to completely fill the weigh bin. You can use the blue color indicator as a guide.

- Touch “Press Here to Begin”. Be sure that the feeder is in “target speed mode” and not in “target throughput mode”.

- After touching the “Press Here to Begin” button the controller will first fill the hopper, then will run the feeder at max speed to prime the feeder, after a short time the motor speed will be set to “Motor Speed for Calibration” and it will continue to dispense an additional amount determined by “Dispense Weight for Calibration”. These values are factory set, but may be adjusted. If during this process you see the “loading arrow” above the graphic for the hopper then you do not have enough material.

- Once finished the “Measured Feed Factor” will be shown and can be recorded for future reference of the material. Doing this eliminates having to perform a feed cal when you switch material. The operator can simply enter this known value into the box.

- Repeat this process for all feeders.
Step 5a: Enter the Recipe and Start the blender (*skip to 5b if you are running all feeders offline and not running them together as a blender*)

- Verify that all materials have been loaded into each hopper.

- Touch the blue recipe percent box for each feeder and enter in the desired percentage. Remember that the total must add to 100%. If the total is not 100% then you will be notified by a Red message.

- The blender knows the minimum and maximum amount that each feeder can perform. A difficult to understand topic is that it is possible to enter in a recipe for a given set of feeders that cannot be ran by the blender. The best example is that if you had 2 feeders, one that can run between 1-100 lbs/hr. and the other that can run between 200-2000 lbs/hr. and you want to run a 50/50 blend. You can clearly see that there is not any speed that the controller can choose to meet this recipe. If you enter a recipe that cannot be ran you will be notified of this by a Red message as shown below.
• After entering in a recipe that adds to 100 and is acceptable by the blender you will be given an “Accept Recipe” button. Touching this button will enter in the new recipe and will make the button disappear.

• If the blender is either used as a starve feeder or it does not have a central weigh hopper then you will also need to enter in the target total blend rate here.

• To make the blender start running touch the “on/off” switch. It will visually illuminate green and will switch positions.

• If you do are using a central non-weighed collection bin then you can also observe the status of each prox switch by the orange and red indicator here.
Step 5b: Configuring a system to run with all feeders offline for individual control (skip this section if you are using the feeders together as a blender)

- You will first need to enter in “0” values into every feeder’s blue recipe box. After this hit “Accept Recipe” and you should see the following page:

- Next you will need to touch each feeder to bring up the “feeder popup” page and set each feeder to “target throughput mode”

- After you do this for each feeder then you can start/stop them by simply entering in the desired throughput rate for each feeder. This method allows you to run many independent feeders from the same controller.
Chapter 13: The Recipe

The AccuMeter blender controller allows a user to specify a recipe much similar to a cooking recipe that tells the system how much of each material to blend. Typically the recipe is in percent of overall blend and must add to 100. In some configurations the blender may be broke down into individual feeders that are not linked by a recipe, but controlled by the same system. In this case the user would instruct the system on how many lbs/hr or kgs/hr to run out of the feeder. In this scenario each feeder would have to be started and stopped individually.

Typical recipe page with feeders linked

CHANGING A RECIPE:

- Touch the blue box on the recipe page for the feeder you want to change
- Enter in the new value and hit the enter arrow
- If the recipe is valid then you will be given an “Accept Recipe” button
- The blender will not take the recipe until you hit the “Accept Recipe” button
**RECIPE ERROR MESSAGES:**

Recipe total not 100%

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**RECIPE CANNOT RUN WITH CURRENT FEEDERS:**

This message means that the current recipe cannot be run at any rate due to the percent entered and the current feeder calibrations for each feeder. The feeder calibration is related to the auger size, gearbox ratio, and the material’s bulk density.

This scenario is difficult for most to understand and can best be explained using an example. Take for example you only have 2 feeders. Each feeder has a motor that can run down to a minimum speed and up to a maximum speed. This is the physical limitation of the motor and cannot be altered. At these speeds each feeder will put out a certain amount of material. These are displayed on the CALIBRATE FEEDER page. In our example feeder 1 is a small auger...
typically used for a color component. It can run between 1-100 lbs/hr. Feeder 2 is a large auger that is typically used for virgin. It can run between 200-2000 lbs/hr. You can clearly see that if you entered in a recipe of 50% and 50% that there would not be any speed at which the two feeders could equal each other to produce a 50/50 blend. The fastest the small auger could run is 100 lbs/hr. The slowest the large auger could run is 200 lbs/hr. At these limits you could only achieve a 33%/67% blend. The AccuMeter knows these limitations and prevents you from entering in a recipe that would make a bad blend. In this scenario you would either have to decrease the auger/gearbox on the large auger or increase the auger/gearbox on the small auger. Below is a chart that can be used as a guideline. These values were measured using a 10:1 gear ratio and pellets at 37 lbs per cubic foot.

**AUGER SIZING CHART**

<table>
<thead>
<tr>
<th>Auger Size</th>
<th>Flow Rate (lbs/hr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>¼” with 3/8” Opening</td>
<td>0.07-2.15</td>
</tr>
<tr>
<td>¼” with 9/16” Opening</td>
<td>0.18-4.65</td>
</tr>
<tr>
<td>3/8” with 9/16” Opening</td>
<td>0.65-19.4</td>
</tr>
<tr>
<td>3/8” with 13/16” Opening</td>
<td>1.02-29.6</td>
</tr>
<tr>
<td>½” with 13/16” Opening</td>
<td>1.54-46.69</td>
</tr>
<tr>
<td>½” with 1-1/4” Opening</td>
<td>5.57-160.9</td>
</tr>
<tr>
<td>½” with 1-1/16” Opening</td>
<td>5.5-164.5</td>
</tr>
<tr>
<td>1” with 1-1/2” Opening</td>
<td>12.1-360</td>
</tr>
<tr>
<td>1-5/8” with 2-1/8” Opening</td>
<td>52-1632</td>
</tr>
<tr>
<td>2” with 2-1/2” Opening</td>
<td>82-2410</td>
</tr>
<tr>
<td>3” with 3-1/2” Opening</td>
<td>280-7272</td>
</tr>
<tr>
<td>3-1/2” with 4-1/2” Opening</td>
<td>519-12,880</td>
</tr>
<tr>
<td>4” with 4-1/2” Opening</td>
<td>555-14,736</td>
</tr>
</tbody>
</table>

These values are highly dependent on material, but will get you close to where you want to be. In the case that you have an auger that is too large or too small then you can use these values in conjunction with the feeder calibration for the material you have to scale these values to match your actual material. You want to be in the middle of the range and not on either end. Some recipe ranges and material differences will require you to have multiple auger and/or gearbox sets.

When you enter a recipe the controller knows the min/max for each auger. From this data and the recipe it can calculate a min/max for the overall blending range. This is displayed on the MASS FLOW POP-UP page by touching the icon for the Mass Flow Hopper on the recipe page. If the CALCULATED BLENDING RANGE shows ****** then it is not possible to run your recipe with the current feeders and you will not be given an “Accept Recipe” button.
Chapter 14: The Mass Flow Data Page

This page can be reached by touching the icon for the mass flow hopper from the recipe page.

- Blending Range based on recipe and feeder calibrations
- Weight at which all feeders will be shut off.
- Steady Window showing MEDIAN point
- Weight at which all feeders will run at the maximum blending rate
- Access to active alarms page
- Indication that mass flow weight is in the steady window
- Target/Actual blender throughput
- Inventory of entire blender. This can be cleared from the INVENTORY PAGE.
- Current weight of material in hopper

CALCULATED BLENDING RANGE: 30.0 to 588.0 Lbs/hr

MASS FLOW HOPPER

TOTALIZER: 2,777 Lbs
A typical pop-up page for fixed rate units that use a non-weighed central collection hopper.

These orange prox graphics will show a RED dot when the system sees material. This should correspond with the light on the real prox.

Without a weighed mass flow hopper the operator must set the blend rate manually. This is also useful when starve feeding as you can specify precisely the rate you wish to blend at.
Chapter 15: The Feeder Data Page

Each feeder has a pop-up page that can be accessed by touching the icon for the hopper from the recipe page. Below details what is shown.

- **Visible when alarms are active. Touch to access alarm page**
- **Manual reload control. Red Circle means reload is shut**
- **Hopper size and reload weight**
- **Manually entered feeder speed for cleanout or volumetric running. This can only be entered if the feeder is in “target speed mode”**
- **Graphical representation of hopper weight between RELOAD (NOT EMPTY) and FULL.**
- **Current weight of material in hopper**
- **Target/Actual throughput of the feeder. If in target throughput mode you can manually enter in this target**
- **Inventory of hopper. This can be cleared from the INVENTORY PAGE**
- **Touch to change between manual speed mode and manual throughput mode**
- **Target/Actual blend percentage. Only visible when the feeder is linked with the blender recipe**

---

AccuMeter Controller Chapter 15: The Feeder Data Page 89
Chapter 16: The Inventory Page

This page is used to record, print, and clear the accumulated inventory for each feeder as well as for the overall total for the blender. You must first log in before you can clear the inventory. Not doing so will not give you an error message, but simply won’t clear the inventory. After you log in and press “Clear Inventory you will be prompted with a verification page before the inventories are actually cleared.

Inventory Shutdown is used when filling gaylords. The blender will make X number of lbs and then will shutoff. The panel alarm is turned on and an alert message is shown on the screen.
Chapter 17: Maintenance

5-1 Preventative Maintenance Schedule
The mechanical design of the blender requires little maintenance. The only moving parts are the refill valves, optional regrind agitators, metering augers, and optional discharge slide gates. The checklist below contains a list of items which should be inspected and/or replaced to keep your blender operating at peak efficiency. Perform each inspection at the regular intervals listed below.

Figure 52: Sample Preventative Maintenance Schedule

<table>
<thead>
<tr>
<th>System model #</th>
<th>Serial #</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Daily</strong></td>
<td></td>
</tr>
<tr>
<td>Date/By</td>
<td></td>
</tr>
<tr>
<td>Date/By</td>
<td></td>
</tr>
<tr>
<td>Date/By</td>
<td></td>
</tr>
<tr>
<td>Date/By</td>
<td></td>
</tr>
<tr>
<td>Date/By</td>
<td></td>
</tr>
<tr>
<td>Date/By</td>
<td></td>
</tr>
<tr>
<td>Date/By</td>
<td></td>
</tr>
<tr>
<td>Date/By</td>
<td></td>
</tr>
<tr>
<td>Date/By</td>
<td></td>
</tr>
<tr>
<td>Date/By</td>
<td></td>
</tr>
</tbody>
</table>

Visual Inspection of equipment for basic mechanical problems

<table>
<thead>
<tr>
<th><strong>Every month</strong></th>
<th>Date/By</th>
<th>Date/By</th>
<th>Date/By</th>
<th>Date/By</th>
<th>Date/By</th>
<th>Date/By</th>
<th>Date/By</th>
<th>Date/By</th>
<th>Date/By</th>
<th>Date/By</th>
<th>Date/By</th>
<th>Date/By</th>
<th>Date/By</th>
<th>Date/By</th>
<th>Date/By</th>
<th>Date/By</th>
</tr>
</thead>
<tbody>
<tr>
<td>Verify the blender is properly calibrated.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Check to make sure that all hose connections are air tight.

Photocopy this page for your maintenance records
Chapter 18:  Spare Parts and Specifications

Typical OL Blender Parts List

<table>
<thead>
<tr>
<th>#</th>
<th>DESCRIPTION</th>
<th>015</th>
<th>060</th>
<th>100</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Lid (0.2 to 1.6 cu. ft. vacuum receivers)</td>
<td>08223-1</td>
<td>08278A</td>
<td>08412-1</td>
</tr>
<tr>
<td></td>
<td>Lid (3.0 and 6.0 cu. ft. vacuum receivers)</td>
<td>N/A</td>
<td>N/A</td>
<td>A0770325</td>
</tr>
<tr>
<td>2</td>
<td>1/8” NPT fitting</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>35085K and 35086K</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>1/4” NPT fitting</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>35154 and 35155</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Bulkhead</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>35146</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Brass elbow</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>35118</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>24V DC Solenoid</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>33128</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Dump cone</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>15370</td>
<td></td>
<td>15237</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Air cylinder</td>
<td>33126</td>
<td>33073</td>
<td>33011G</td>
</tr>
</tbody>
</table>

Weigh Hopper Parts List

<table>
<thead>
<tr>
<th>Analog Load cells</th>
<th>7 kgs.</th>
<th>10 kgs.</th>
<th>15 kgs.</th>
<th>30 kgs.</th>
<th>150 kgs.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>724.00835.00</td>
<td>724.00836.00</td>
<td>724.00832.00</td>
<td>724.00839.00</td>
<td>61-1250-150KG</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Digital Load cells</th>
<th>30 kgs.</th>
<th>60 kgs.</th>
<th>90 kgs.</th>
<th>150 kgs.</th>
<th>kgs.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure 64: Typical Allen-Bradley Controller Main Parts List

<table>
<thead>
<tr>
<th>#</th>
<th>Description</th>
<th>ALL MODELS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Allen-Bradley CompactLogix, CPU</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>24 VDC power supply</td>
<td>A0563932</td>
</tr>
<tr>
<td>3</td>
<td>12 VDC power supply</td>
<td>739.00027.00</td>
</tr>
<tr>
<td>4</td>
<td>Alarm light - Yellow strobe 24 VDC</td>
<td>A0565889</td>
</tr>
<tr>
<td>5</td>
<td>Glass fuse – 3.0 amp (115 volt)</td>
<td>A0542207</td>
</tr>
<tr>
<td>6</td>
<td>120 volt light bulb (power switch)</td>
<td>715.01034.02</td>
</tr>
<tr>
<td>7</td>
<td>Digital Loadcell Interface COM Module (1 per blender)</td>
<td>724.00929.00</td>
</tr>
<tr>
<td>8</td>
<td>Digital Loadcell Interface Board (1 per feeder)</td>
<td>724.00930.00</td>
</tr>
</tbody>
</table>

Figure 65: Typical Allen-Bradley Display Main Parts List

<table>
<thead>
<tr>
<th>#</th>
<th>Description</th>
<th>All MODELS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Allen-Bradley PanelView Plus CE Display ONLY</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Allen-Bradley PanelView flash memory card</td>
<td>CONSULT FACTORY</td>
</tr>
<tr>
<td>3</td>
<td>PanelView 100 connection cable</td>
<td></td>
</tr>
</tbody>
</table>

AccuMeter Controller  Chapter 18:  Spare Parts and Specifications  92
Specifications

The following design information is provided for your reference:

1. No modifications are allowed to this equipment that could alter the CE compliance
2. Ambient temperature: 0-55 C (32-131 F) – Maximum
3. Humidity range: 5-95% without condensation
4. Altitude: 2000 m (6561 ft) without derating
5. Environment: Clean, dust-free and non-explosive
6. Radiation: None
7. Vibration: Minimal, i.e. machine mounting
8. Special installation requirements: Clean, dry compressed air 1 cfm @ 60 psi (1.7 m³/hr @ 4.14 bar)
9. Allowable voltage fluctuation: +/- 10%
10. Allowable frequency fluctuation: Continuous +/- 1%
     Intermittent +/- 2%
11. Nominal supply voltage: 230/1/50 or 60 (Verify on serial number tag)
12. Earth ground type: TN (system has one point directly earthed through a protective conductor)
13. Power supply should include a neutral power connection.
14. Over-current protection is supplied in the blender control panel, but additional protection should be supplied by the user.
15. The plug on the power cord serves as the electrical disconnect device.
16. Unit is equipped with three-phase motors (driven by single phase motor drive cards).
17. Functional identification
18. Cable support may be required for power cord, depending on final installation.
19. No one is required to be in the interior of the electrical enclosure during the normal operation of the unit. Only skilled electricians should be inside the enclosure for maintenance.
20. Doors can be opened with a screwdriver, but no keys are required.
21. Two-hand control is not required, or provided.
22. All hoppers should be moved around and set in place with a lift truck or equivalent.
23. There are no frequent repetitive cycles that require manual control—repetitive functions are automatic while the blender is operating.
24. An inspection report detailing the functional test is included with the AccuMeter blender.
25. The machine is not equipped with cable less controls.
26. Color-coded (harmonized) power cord is sufficient for proper installation.
Chapter 19: Security

Note: Personnel not extremely familiar with this blender controller should not use this section of the manual, or program can be compromised!

Caution! After all selections are made: Keep pressing the “Done” key until the unit returns to the Recipe menu.

Note: Inexperienced operators or plant personnel should not access programmable features. Unauthorized changes may prevent the blender from operating properly and may void part or all of the warranty.

Note: Call the Service Department for assistance or for further explanation of these or any other programmable features, which may or may not be shown in this manual.

Note: Information included in this manual is subject to change without notice.

NOTE: The “Clearing Inventory” function can be password protected. Enabling this would require the OPERATOR LEVEL password.


Security Basics

The AccuMeter controller is setup with 3 levels of access:

1. **Entry Level** (no login required). This level always has access to:
   - Change Recipe
   - Change Target Blend Rate (for fixed rate units)
   - Start/Stop feeders or blender
   - View Alarms
   - View Inventory

2. **OPERATOR LEVEL**. Login with user set to “OPERATOR” and password set to “5413”
   - All access of Entry Level
   - Clear Inventory
   - View and change all configuration parameters for feeders and mass flow hopper
   - View Trend Info
   - Access to Allen Bradley Display configuration
   - Access to SETUP DIRECTORY to change units
   - Access to Change OPERATOR LEVEL password

3. **SUPERVISOR LEVEL**. Login with user set to “SUPERVISOR” and password set to “3145348”
   - All access of Entry and OPERATOR level
   - Access to ACS ENGINEERING ONLY DIRECTORY to change:
     a. Enable I/O slots for PLC cards
     b. Enable additional Feeders
     c. Assign feeders to different blenders
   - Access to Change SUPERVISOR LEVEL password

You can only modify the password for the level that you are logged in as. For example the Supervisor cannot modify the Operator level password. This is contrary to how most security systems work, but is the way that Allen Bradley configured their security scheme. However, if you get locked out by an operator (or even a supervisor) who no longer has the password then you can bypass this by the following:

1. Eject Compact Flash card from the back of the display.
2. Reboot the display with the card removed. When it comes back up you will get a runtime error because it cannot find the card.
3. Go through the procedures in this manual to PROGRAM THE DISPLAY and the passwords will be set back to default.
Chapter 20: Technical Assistance

Parts Department

Call toll-free 7 am–5 pm CST 800.423.3183 or call 847.273.7700 Fax 847.273.7812

The ACS Customer Service Group will provide your company with genuine OEM quality parts manufactured to engineering design specifications, which will maximize your equipment’s performance and efficiency. To assist in expediting your phone or fax order, please have the model and serial number of your unit when you contact us. A customer replacement parts list is included in this manual for your convenience. ACS welcomes inquiries on all your parts needs and is dedicated to providing excellent customer service.

Service Department

Call toll-free 8 am–5 pm CST 800.423.3183 or call 847.273.7700
Emergencies after 5 pm CST, call 847.439.5655

We have a qualified Service Department ready to help. Service contracts are also available for most of our products. See www.acscustomerservice.com

Sales Department

Call 847.273.7700 Monday–Friday, 8 am–5 pm CST

Our products are sold by a world-wide network of independent sales representatives. Contact our Sales Department for the name of the sales representative nearest you.

Contracting Department

Call 847.273.7700 Monday–Friday, 8 am–5 pm CST

Let us install your system. The Contracting Department offers any or all of these services: project planning; system packages including drawings; equipment, labor, and construction materials; and union or non-union installations.