DFE DOVER FLEXO ELECTRONICS, INC.
ISO 9001 CERTIFIED

INSTRUCTION MANUAL
SteadyView™ Tension Indicator
Panel Mount

5 YEAR WARRANTY

DFE DOVER FLEXO ELECTRONICS, INC.

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U.S.A. F.C.C. STATEMENT

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules.

These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.

Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

CAUTION!
Changes or modifications not expressly approved by Dover Flexo Electronics could void the user's authority to operate this equipment.

SECTION 1   INTRODUCTION

The SteadyView tension indicator is a versatile, accurate, yet low-cost instrument designed to indicate process web tension. Its small size and low cost allow it to be used in many applications which previously required expensive equipment. The unit can be used to display running web tension and will allow the machine operator to produce higher quality product at lower cost.

Features on this unit include a relay output activated by either high or low tension, or both (which can be used to indicate web breakage); and a serial output which can be used for data collection or to print web tension over a period of time.

1.1   Features
- 1/4-DIN size fits most anywhere
- Usable with standard or extended range transducers
- .27" (7mm) high 8-character dot matrix LED display with very wide viewing angle
- Can be calibrated in a large variety of units (including tension /unit width of web)
- Measurement units are shown directly on display
- Measurement units can be changed without recalibration
- Calibration does not require potentiometers
- Serial interface allows communication with computers for data collection
- Tension limit switch allows alarm for web breakage
- UL-compliant

1.2   Specifications

ELECTRICAL

Power input:	115/230VAC (switch selectable, external) 50/60 Hz, 250 mA
Transducer excitation:	5 or 10 VDC (switch selectable, internal)
Transducer input signal:	500 mVDC per pair at rated load
Zero range:	95% of transducer rating
Tension signal outputs:	Analog voltage output 0-10 VDC or 0-20mA or 4-20mA tension signal (switch selectable, internal)
Tension limit switch outputs:	Normally open and normally closed relay contacts rated at 250 mA DC

MECHANICAL

Dimensions:	See Fig. 1
Panel cutout:	3.66" W x 3.66" H (92mm W x 92mm H)
Depth behind panel:	6" D (152mm D)

ENVIRONMENTAL

Relative humidity	50% to 95%, non-condensing

FRONT   SIDE   REAR

PANEL CUT-OUT   REQUIRED DEPTH BEHIND PANEL
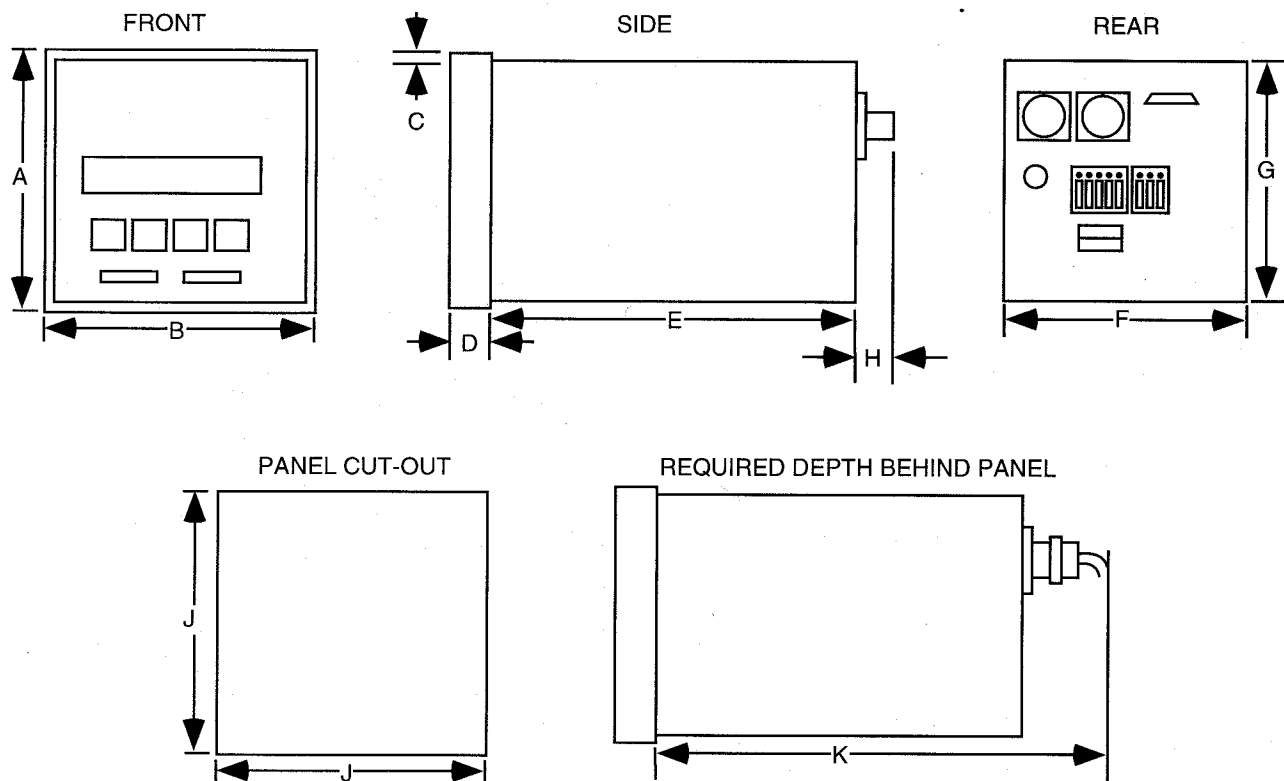
	A	B	C	D	E	F	G	H	J	K
in	3.75	3.75	.19	.50	6.00	3.56	3.56	.63	3.62	8.75
mm	95	95	5	13	152	90	90	16	92	222

Figure 1 - Dimensions

1.3 Typical Tensions for Web Materials

MATERIAL	TYPE	TENSION CALCULATION
Acetate		0.5 lb per mil per inch of width
Foil	Aluminum	0.5 lb per mil per inch of width
Foil	Copper	0.5 lb per mil per inch of width
Cellophane		0.75 lb per mil per inch of width
Nylon		0.25 lb per mil per inch of width
Paper	15 lb*	0.4 lb per inch of width
Paper	20 lb*	0.5 lb per inch of width
Paper	30 lb*	0.75 lb per inch of width
Paper	40 lb*	1.25 lb per inch of width
Paper	60 lb*	2.0 lb per inch of width
Paper	80 lb*	3.0 lb per inch of width
Paper	100 lb*	4.0 lb per inch of width
Paperboard	8 pt	3.0 lb per inch of width
Paperboard	12 pt	4.0 lb per inch of width
Paperboard	15 pt	4.5 lb per inch of width
Paperboard	20 pt	5.5 lb per inch of width
Paperboard	25 pt	6.5 lb per inch of width
Paperboard	30 pt	8.0 lb per inch of width
Polyethylene		0.12 lb per mil per inch of width
Polyester	Mylar	0.75 lb per mil per inch of width
Polypropylene		0.25 lb per mil per inch of width
Polystyrene		1.0 lb per mil per inch of width
Saran		0.15 lb per mil per inch of width
Vinyl		0.05 lb per mil per inch of width

For laminated webs, sum the tension for the individual webs and add 0.1 lb per inch of width.

* = Weights for paper are based on a ream of 3000 square feet.

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2.1   Reading Web Tension

Once the unit has been set up, it will show the web tension as soon as power is turned on. A typical display looks like this:

500   oz

The measurement appears on the left side of the display, and the units used for the measurement appear on the right.
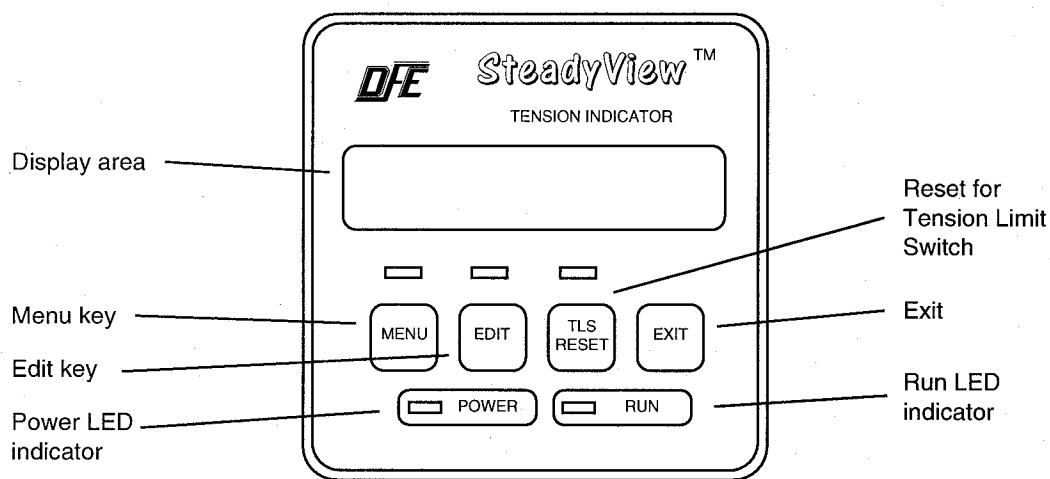
Figure 2 - Front Panel

2.2   Operator Controls and Indicators

Figure 2 shows the front of the SteadyView unit. Just a few of the controls are used by the machine operator. The Menu, Edit and Exit keys are used when setting up the unit.

Power LED   This lights when the SteadyView unit is receiving power.

Run LED   This lights when the SteadyView unit is ready to operate normally. (This light goes out when the unit is being set up.)

TLS Reset   The SteadyView has a "Tension Limit Switch" function. This function can be used to produce an alarm if the tension on the web is too high or too low. It can be used to detect a break in the web. During set-up, you can select the high and low limits.

Once the unit is running, if the tension moves outside of the normal limits, the LED above the TLS Reset button will light. The SteadyView may also be set to send a signal to another piece of machinery.

The TLS function may be set to reset itself automatically, once the tension is normal again. If the function is set this way, the LED will go out by itself.

The function may also be set to "latch." To reset the function, the operator must press the TLS Reset key.

3.1   Mounting the Unit

Figure 2 shows the dimensions of the SteadyView unit. If the unit will be mounted in a panel, make a cutout 3⁹/₁₆" x 3⁹/₁₆" (92mm x 92mm). The unit may also be mounted using an optional stand. Be sure all of the connecting wiring is protected.

3.2   Disassembling the Indicator

Some set-up jobs require you to remove the indicator from its case:

- Changing the signal output (analog voltage or current loop)
- Changing the transducer excitation voltage (5V or 10V)
- Changing the EPROM memory ICs to update the software which controls the unit
- Changing serial interface

CAUTION!

Remove the AC wiring from both the indicator and from its source before proceeding!

CAUTION!

Many of the parts inside the SteadyView can be damaged by sparks caused by static electricity. You can prevent this by making sure both you and your work surface are properly grounded before you open the case of the indicator.

Here is the disassembly procedure:

a. Remove the two black plastic screws holding the front panel to the indicator.

b. Tilt the indicator toward you. The face plate should fall outward.

c. The face plate is connected to the rest of the unit by a small ribbon cable. Find the connector at the indicator end of this cable and remove it. Slide the connector downward off of the connector pins.

d. On the rear of the unit, remove the four 6-32 socket head cap screws holding the rear panel onto the rear of the enclosure.

e. Slide the interior PCB assembly toward the rear of the unit and remove it from the enclosure.

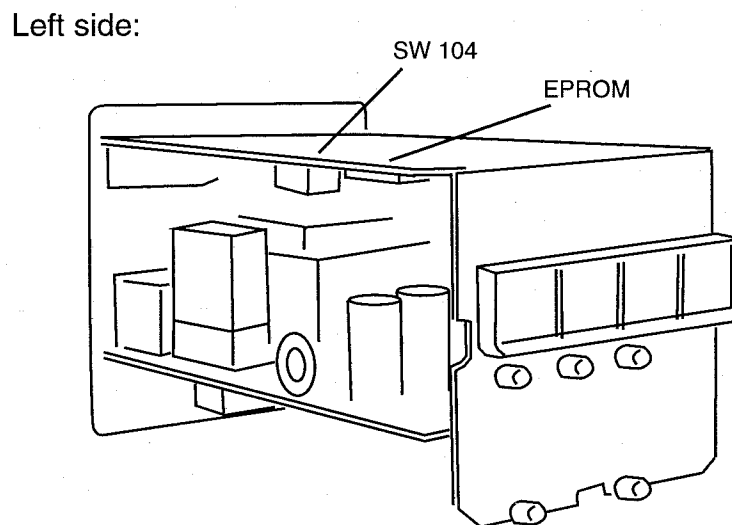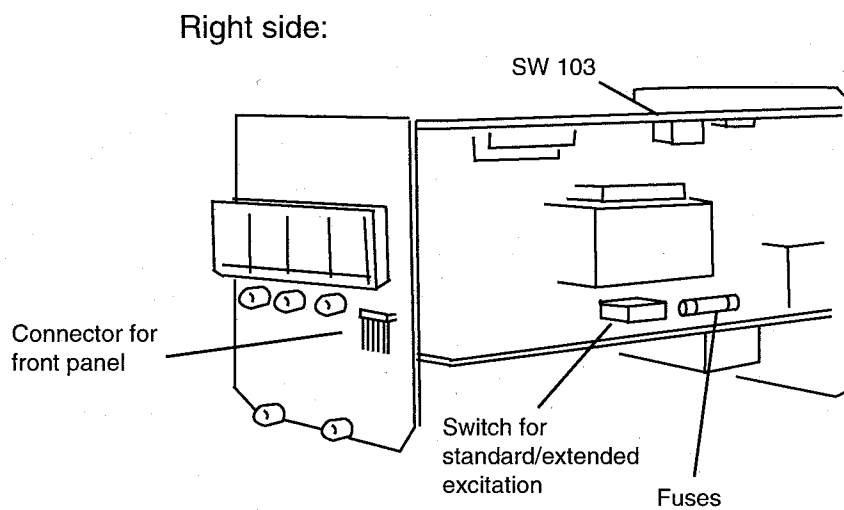f. Set the interior PCB assembly down on your work surface.

Right side:

SW 103

Connector for
front panel

Switch for
standard/extended
excitation

Fuses

Left side:

SW 104

EPROM

Figure 3 - Interior of Unit

3.3   Changing the Transducer Excitation Voltage

a.   This unit can be set to provide two levels of excitation voltage. The "normal/extended range" selection switch is located on the right side of the Power PCB beside the power transformer and in front of the fuses. See Fig. 3. When the switch actuator is toward the front of the board, the switch is in the normal or 5V excitation position. When the actuator is toward the rear of the PCB, the switch is in the extended range or 10V position. The excitation voltage is marked on the silk screen on either side of the switch. Slide the switch actuator to the position appropriate for the transducer(s) you are using.

CAUTION!

Do not use extended range excitation unless the transducer is designed for this. The wrong excitation voltage can damage the transducer! If in doubt about the correct excitation voltage, contact the Service Department at Dover Flexo Electronics for assistance.

b.   If you choose extended range excitation, you must also set one of the DIP switches mounted on the circuit boards. See Fig. 3.

To select standard range:
   On SW103, position 8 closed

To select extended range:
   On SW103, position 8 open

3.4   Signal Output Connections

The rear panel includes contacts for an output to a remote meter or indicator. You may select voltage or current-loop outputs. At any moment, the output here is proportional to the percentage of the indicator's full range. For example, if the indicator is set to read 0-100 ounces, and is indicating 50 ounces, the signal output will also be 50% of maximum.

a.   To select voltage output or current output, disassemble the unit as described in section 3.2. Figure 3 shows the locations of the two DIP switches mounted inside the unit. Figure 4 shows the rear panel on the unit.
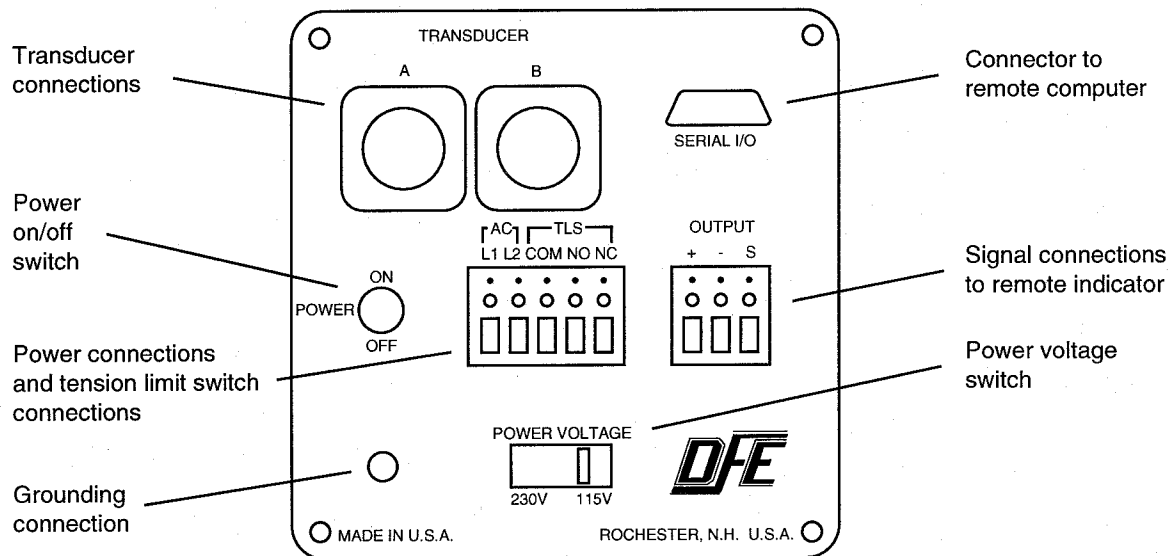
Figure 4 - Rear Panel

To select voltage output:

On SW103, positions 1 and 2 open, positions 3 and 4 closed

(The unit is configured at the factory for 0 -10V output. Other output voltages are also available.)

To select current output:

On SW103, positions 1 and 2 closed, positions 3 and 4 open

If current output is selected, to select 4 to 20 mA output:

On SW103, positions 5 and 6 closed

If current output is selected, to select 0 to 20 mA output:

On SW 103, positions 5 and 6 open

b. Make the connections on the right-hand terminal block on the rear panel.

1   (+)   Output signal

2   (-)   Output return

3   (S)   Spare (Not used)

3.5 Connections for Tension Limit Switch Function

a. Make the connections for the tension limit switch function (TLS) on the left-hand terminal block. (This function provides an alarm if the tension moves too high or low. It can be used to detect a break in the web. You set the limits during the set-up process.) Connections are terminal 3 (COM- Common), terminal 4 (NO- normally open), and terminal 5 (NC- normally closed).

b. Make the other connection depending on the function you want. If the relay contacts should remain open as long as the tension is correct, use terminal 4 (NO - normally open). If the relay contacts should remain closed as long as the tension is correct, use terminal 5 (NC - normally closed).

3.6 Transducer Connections

a. The sensor roll includes one or two transducers. These parts sense the tension on the roll, and report back to the SteadyView unit. Make the connections for the transducers. If you are using pre-wired connectors supplied by Dover Flexo Electronics, plug in the connectors.

Transducer cable types

Transducer Model	Cable Length	Current Part Number	Old Part Number	Number of Cables Needed
Model C transducer with straight connectors on transducer end	15' (4.5m)	721-0963	E197A-15	2
	20' (6m)	721-0972	E197A-20	2
Model C transducer with right-angle connectors on transducer end	15' (4.5m)	721-0996	E1332A-15	2
	20' (6m)	721-1066	E1332A-20	2
Model NW transducer	15' (4.5m)	721-0962	E1308A-15	1
Model RF transducer	15' (4.5m)	721-0995	E1976A-15	1
Model TR transducer	15' (4.5m)	721-0995	E1976A-15	1

b. The SteadyView unit is also available with terminal blocks instead of Amphenol-type connectors. If this is the case, make the following connections between your transducer(s) and the terminal blocks on the rear panel of the SteadyView unit.

Transducer Connector A assignments
    A   Signal (+)
    B   Excitation (-)
    C   Excitation (+)

Transducer Connector B assignments
    A   Signal (-)
    B   Excitation (+)
    C   Excitation (-)

3.7 Preparing the Power Cable

a. The cord must be equipped with a third grounding wire, and the plug must have three prongs.

b. Strip the free end of the wires as shown in Fig. 5.

c. A ground lug is included with the SteadyView unit. Attach this to the free end of the ground wire.
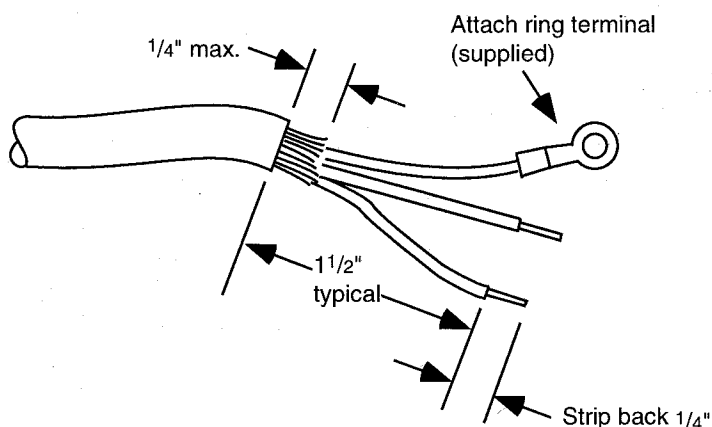

Figure 5 - Preparing Power Cable

3.8 Power Connections

a. The Power Voltage switch on the rear panel sets the operating voltage of the SteadyView unit. Check that this is set correctly.

b. Make the AC power connections on the left-hand terminal block. Use terminals L1 and L2. Connect the ground wire to the lug in the lower left-hand corner of the panel.

This section is intended for experienced technicians who want to set up the unit with a minimum of advice. For more detailed set-up instructions, see Section 5.

Note - If you want to set up the unit for operation using a foreign language, see Section 4.3.

4.1   Collect Information About Your Application
Decide on these values before you start:
- Units used for the display (ounces, grams, etc.)
- Highest value you will want the unit to display
- Web width
- Weight used for calibration

4.2   Quick Programming Instructions

STEP 1 - Choose the units used for measurement
- Turn power switch on.
- Optional - Erase all values by pressing Menu, Edit and Exit keys at the same time. The three LEDs will light in sequence.
- Unit menu will show:

      UNIT lb

- Press Edit to choose correct units:

lb	pounds	total across whole width of web
oz	ounces	total across whole width of web
gm	grams	total across whole width of web
N	Newtons	total across whole width of web
ozi	ounces	per inch of web width
PLI	pounds	per inch of web width
Ncm	Newtons	per centimeter of web width
gcm	grams	per centimeter of web width

- Press Exit to save.
- Press Menu to move on.

STEP 2 - Set the upper end of the indicated range

This value should be about 25% higher than any normal reading.

- Go to the Range menu:

    RNG 0000

- Press Edit to change the first digit.
- Press Menu to move to the next digit.
- Use Edit to change this digit, if necessary.
- Repeat for other digits.
- When finished, press Exit.
- Press Menu to move on.

STEP 3 - Set the web width

(Only if you selected measurement by ozi, pli, Mcm or gcm)

- Go to the Web Width menu:

    IN 000.0

- Make the setting using Edit to change, Menu to go to next digit.
- When finished, press Exit.
- Press Menu to move on.

STEP 4 - Zero the system

- Go to the Zeroing menu:

    ZERO?

- Press the Edit button:

    Remove weight and press EDIT

- Remove the web from the sensing roll.
- Press Edit again.
- Press Menu when the menu says:

    ZEROED

STEP 5 - Enter the calibration weight
- Go to the Calibration Weight menu:

      WT xxxx

   Use a weight which is 50% to 90% of the full range value.
- Make the setting using Edit to change, Menu to go to next digit.
- When finished, press Exit.
- Press Menu to move on.

STEP 6 - Do the calibration
- Go to the Calibration menu:

      CAL?

- Press Edit to continue:

      Apply weight & press EDIT

- Hang the test weight from the sensor roll. Thread a length of rope over the center of the roll. Be sure to follow the exact path of the web. The rope must extend from the roll *before* the sensing roll to the roll *after* it. See Fig. 6.
- Once the weight is on the sensing roll, press Edit.
- When the process is finished, press Menu to move on.

Place the rope over
the center of the
tension-sensing roll

Idler roll   Idler roll

Tie off the other
end of the rope.

Wrap the rope over the
rollers, following the
exact path of the web.

Attach a weight to one
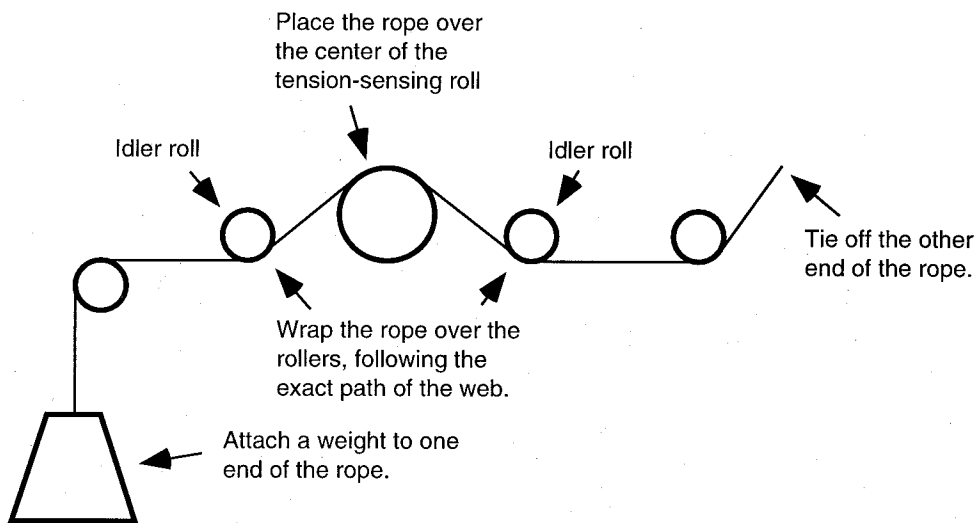end of the rope.

Figure 6 - Rigging Calibration Weight

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STEP 7 - Re-zero
- Go to the Rezeroing menu:

    REZERO?

- Press Edit:

    Remove weight and press EDIT

- Remove the weight and rope, then press Edit.
- When menu says Rezeroed , either press Menu to continue set-up, or press Exit twice then Menu to leave set-up and measure tension.

STEP 8 - Set up the tension limit switch
- Go to the TLS Set-Up menu:

    TLS OFF

- If the TLS is off, to skip this item, press Menu. Go to Step 11.
  To set up the TLS, press Edit.
- Press Edit to get the function you want:

    TLS OFF   Off
    TLS MOM   Momentary on, resets automatically
    TLS LTCH   Latches, must be reset using the TLS Reset button

- When finished, press Exit.
- Press Menu to move on.

STEP 9 - Set the low limit for the tension limit switch
- Go to the Low Limit menu:

    LO xxxx

- Make the setting using Edit to change, Menu to go to next digit.
- When finished, press Exit.
- Press Menu to move on.

STEP 10 - Set the high limit for the tension limit switch
- Go to the High Limit menu:

    HI xxxx

- Make the setting using Edit to change, Menu to go to next digit.
- When finished, press Exit.

STEP 11 - Set the address for the serial interface
- Go to the Address menu:

    ADDR 0

- To prepare to change the address, press Edit.
- Press Edit again to change the value. (Do not use address 0 for any SteadyView units if more than one will be connected to the system.)
* When finished, press Exit.

STEP 12 - Save the settings
- Press Exit again to get the Store or Abort message. Press Menu to store the settings, Edit to go back and make changes, or Exit to leave without making changes.

4.3   Setup for Foreign Language Operation

Note - If you want the displays to appear in a foreign language, do this setup procedure before you do the other setup steps listed in section 4.1.
- Hold down the Menu key as you turn on the power switch on the rear of the SteadyView unit.
- The display will say:

    English

- To prepare to change the language, press Edit.
- Press Edit again to get the language you want.
- When the correct language is displayed, press Exit.
- Press Menu to go to the other steps in the setup.

This unit has been designed to be easy to set up. Experienced users should see Section 4 for quick set-up instructions. We have included detailed instructions here to provide as much information as possible, and answer any questions you may have.

Note - The SteadyView can be set up to display information in several foreign languages. If you want to use this option, see Section 5.6.

5.1   Using the Keys on the Front Panel

Figure 3 shows the front panel of the SteadyView unit. There are four keys which may be used by the operator. All except TLS Reset are only used during set-up. You do not have to memorize the functions of these keys, but they are described here in case you have questions about the functions.

MENU key -

The Menu key has four possible functions, depending on what the SteadyView is doing at the moment:

- When the unit is running normally and measuring tension (Run mode), pressing Menu begins the set-up process.

- If the set-up process has already begun (Menu mode), pressing Menu moves you to the next menu item.

- If you are entering a number for a value (Edit mode), pressing Menu moves the editing position one digit to the right.

- When you are ready to save the set-up values (Store or Abort mode), pressing Menu saves the values you have selected and takes you back to Run mode.

EDIT key -

The Edit key has three possible functions, depending on what the SteadyView is doing at the moment:

- During the set-up process (Menu mode), it allows you to change the value of the menu item being displayed.

- If you have used Edit to select an item or digit (Edit mode), you can continue to press Edit to select between possible choices. If you are entering a number, each time you press Edit you increase the value of the flashing digit by one.

- When you are ready to save the set-up values (Store or Abort mode), press Edit to go back and check your changes without storing them.

TLS RESET key -

The SteadyView has a "Tension Limit Switch" function. This function can be used to produce an alarm if the tension on the web is too high or too low. During set-up, you can select the high and low limits. Once the unit is running, if the tension moves outside of the normal limits, the LED above the TLS Reset button will light. The SteadyView may also be set to send a signal to another piece of machinery.

- The TLS function may be set to reset itself automatically, once the tension is normal again. If the function is set this way, the LED will go out by itself.
- The function may also be set to "Latch." To reset the function, the operator must press the TLS Reset key.
- This function may also be set to "Off" if it will not be used.

EXIT key -

The Exit key has three possible functions, depending on what the SteadyView is doing at the moment:

- During the set-up process (Menu mode), pressing Exit takes you to Store or Abort mode. From here you can save your changes, go back and try again, or go back to Run mode without saving changes.
- If you have used Edit to select an item or digit (Edit mode), pressing Exit returns you to Menu mode.
- If you are ready to save the set-up values (Store or Abort mode), Exit allows you to go back to Run mode without saving any of the changes you have just made.

5.2   How the Menus are Organized

When the unit is running normally, there is just one display. It shows the tension, and the units used to make the measurement.

During set-up, there are 10 menus. They are arranged in a loop. This means that, if you keep moving through the menus, you will come back to the starting point. To start the process, you press Menu. Press Menu again to move from one menu to another. All of the menus do not appear every time you go through the list. Some of them appear only if you make a change in another menu.

Here is a list of the menus:

Menu	Function
UNIT	Choose the units used for measurement
RNG	Set the upper end of the indicated range
IN (or cm)	Set the web width (optional– appears only if PLI, ozi, gcm or Ncm is selected in Unit menu.)
ZERO?	Zero the system
WT	Enter the calibration weight (appears only if you change Range)
CAL?	Do the calibration
REZERO?	Re-zero
TLS	Set up the tension limit switch
LO	Set the low limit for the tension limit switch (appears only if you change the function of the tension limit switch)
HI	Set the high limit for the tension limit switch (appears only if you change the function of the tension limit switch)
ADDR	Set the address used by the serial interface to connect the SteadyView to a host computer (if there is more than one SteadyView unit)

Once you reach the last menu, if you press the Menu key again, you will roll around to the UNIT menu again.

5.3 About the Setup Process

The set-up process is simple. There are a number of steps in the process, but each of the steps is easy. To set the unit up, you work through each of the menus listed in the last section. In each menu, you make a choice or enter a number. You will have as many chances as you want to try again. You can't damage the equipment by entering a wrong value.

If the SteadyView unit is new (that is, one without any programmed values), you must go through some of the menus, even if those menus are already set correctly. You cannot use the Menu key to skip over these menus. For example, on a new indicator, the menu will default to show a choice of "lb" for UNIT. Even if you want to use this choice, you have to go to Edit mode (by pressing Edit), select "lb," and press Exit. The unit will not allow you to go to the next menu until you do this.

The SteadyView will remember your settings until they are changed. If you want to erase all of the settings stored in the unit, press the Menu, Edit and Exit keys for 5 seconds. The three LEDs will then flash in sequence.

5.4   Collect Information About Your Application

Before you start, decide on these values:

- What units will the SteadyView use for measuring (ounces, grams, etc.)? Will the SteadyView display the load on the whole width of the sensor roll, or the load per unit of web width (pounds per inch, grams per centimeter, etc.)? If you are not sure which units to use, contact Dover Flexo Electronics.

  Write the units used for the display here: _____

- What is the highest value you will want the unit to display? (The lowest value will probably be zero).

  Write the planned display range here: _____

- How wide is the web?

  Write the web width here: _____

- The unit will be "calibrated" by hanging a weight from the sensor roll. This should be about 50% to 90% of the highest value you plan to display. How heavy a weight will you use during calibration?

  Write the calibration weight here: _____

5.5   Programming the Unit

STEP 1 - Choose the units used for measurement

a. Turn on the power switch on the rear of the unit. If the unit is new, the three LEDs on the front will flash in sequence. This shows that none of the setup values have been stored yet.

b. The next menu will say:

   UNIT lb

   Choose the units - pounds, ounces, grams, etc. One of these units will appear on the menu. If you want to change the units, press Edit.

c. Keep pressing Edit until you see the units you want to use. Here are the choices:

lbs	pounds	total across whole width of web
oz	ounces	total across whole width of web
gm	grams	total across whole width of web
N	Newtons	total across whole width of web
ozi	ounces	per inch of web width
PLI	pounds	per inch of web width
Ncm	Newtons	per centimeter of web width
gcm	grams	per centimeter of web width

d. When you are finished press Exit to store the setting. The unit will return to this menu:

   UNIT lb

e. Press Menu to go on to the next menu.

STEP 2 - Set the upper end of the range

Use this function to set the highest value the unit will be able to measure. This value should be about 25% higher than any normal reading you will expect to see. For example, if your running tension is 100 lb., use an upper limit of 125 lb. (Note - This value is used by the measuring system - it does not affect the trip points for the TLS tension limit switch.)

a. The Range menu looks like this:

RNG 0000

b. What is the highest value you will want the SteadyView to be able to read? (This menu uses the units you set in the last step. For example, if you set the unit for oz = ounces, "1000" means 1000 ounces.)

c. Press Edit to change the setting. The first digit will flash:

RNG 0000

d. To change the value of the first digit, press Edit again.

e. When the setting for the first digit is correct, press Menu to move to the next digit.

RNG 1000

f. Use Edit to change this digit, if necessary.

g. Press Menu to move to the next digit. Make any necessary changes using Edit.

h. When you are finished, press Exit to return to the Range entry screen, which should show the new value. Here is an example:

RNG 1100

i. Press Menu to go to the next menu.

STEP 3 - Set the web width

(This menu appears only if you have chosen measurement per unit of web width - ozi, PLI, Ncm, or gcm).

a. The Web Width menu shows the width of the web, using the units you have chosen:

IN 000.0

or

CM 000.0

b. To begin making changes, press Edit. The first digit will flash

c. To increase the value of this digit, press Edit again.

d. Press Menu to move to the next digit.

e. When you are finished, press Exit to return to the Web Width menu.

f. Press Menu to go to the next menu.

STEP 4 - Zero the system

In this step, you allow the SteadyView unit to weigh the sensing roll without the weight of the web. (This menu will appear only if you have changed the Range menu, or the unit is new.)

a. The Zeroing menu looks like this:

> ZERO?

b. Press the Edit button. The menu will read:

> Remove weight and press Edit

c. Remove the web from the sensing roll. It is important to do this before taking the next step.

d. Once the weight is off the sensing roll, press Edit. For a moment, the menu will read:

> Zeroing please wait

e. When the unit is finished, the menu will read:

> ZEROED

f. Press Menu to go to the next menu.

STEP 5 - Enter the weight used for calibration

(This menu will appear only if you have changed the Range menu, or the unit is new.)

a. The Calibration Weight menu looks like this:

> WT xxxx

During calibration, you hang a known weight from the sensor roll. You use the Calibraton Weight menu to enter the weight you will be using.

The value which first appears on this menu will be the value you entered earlier for Range. You should change this to match the actual weight you use during calibration. A weight of 25 lb. to 50 lb. will usually work, if this is 50–80% of full scale. You can also take the full range figure you developed earlier, and use 25% to 50% of that.

b. Press Edit to change the weight. The first digit will flash.

> WT xxxx

c. Press Edit again to increase the value of this digit.

d. Press Menu to move to the next digit.

e. When the weight is correct, press Exit to return to the Calibration Weight menu:

> WT xxxx

f. Press Menu to go to the next menu.

STEP 6 - Do the calibration

(This menu will appear only if you have changed the Range menu.)

a. The Calibration menu looks like this:

CAL?

b. To continue with the calibration, press Edit. The display will say:

Apply weight & press EDIT

c. Hang the test weight from the sensor roll. Thread a length of rope over the center of the roll. Be sure to follow the exact path of the web. The rope must extend from the roll before the sensing roll to the roll after it. See Fig. 6.

d. Once the weight is on the sensing roll, press Edit to begin the calibration. When the process is finished, the menu will say:

CALIBRTD

e. Press Menu to go to the next menu.

STEP 7 - Repeat the zeroing procedure

a. After the SteadyView has been calibrated, it is important to repeat the zeroing process. The Rezeroing menu looks like this:

REZERO?

b. Press Edit to begin the rezeroing process. The menu will say:

Remove weight & press EDIT

c. Remove the test weight and the rope you used during calibration. Also be sure the web and any other weights are removed from the sensor roll. Press Edit when the roll is ready. The menu will say:

REZEROING

e. When the process is done, the menu will say:

REZEROED

f. Press Menu to go to the next menu. (To leave the set-up process and measure tension, press Exit twice, then Menu.)

STEP 8 - Set up the tension alarm (tension limit switch)

This detector signals if the tension moves outside of the high and low limits you set.

a. The TLS Set-Up menu looks like this:

TLS OFF

b. If the TLS is off and you want to skip this item, press Menu. Go to Step 11.

   To set up the tension alarm, press Edit. The menu will show whether the alarm is turned on. There are three possible menus. Press Edit again to choose the function you want:

   TLS OFF   Tension limit switch is turned off

   TLS MOM   Tension limit switch is turned on, presents an alarm only while the tension is outside the limits, resets automatically

   TLS LTCH   Tension limit switch is turned on, presents an alarm while the tension is outside the limits, alarm continues until reset using the TLS Reset button on the front of the unit

c. When the setting is correct, press Exit.

d. Press Menu to go to the next menu.

STEP 9 - Set the low limit for the tension limit switch

   (This menu will appear only if you have changed the function on the TLS Set-Up menu.)

   If you want to turn off the low limit function, so the TLS will not respond if the tension drops, set the low limit to zero.

   a. The menu for the low limit looks like this:

      LO   xxxx

   b. Press Edit to call up the first digit. Keep pressing Edit to change the digit.

   c. Press Menu to move on to the next digit. Press Edit to change this digit.

   d. Do the same with the other digits. When the setting is correct, press Exit.

      Note: If you try use too large a number for the low limit, the menu will say "Error" and return you to the beginning of this menu.

   e. Press Menu to go to the next menu.

STEP 10 - Set the high limit for the tension limit switch

   (This menu will appear only if you have changed the function on the TLS Set-Up menu.)

   If you want to turn off the high limit function, so the TLS will not respond if the tension rises, set the high limit to the upper limit of the range.

   a. The menu for the high limit looks like this:

      HI   xxxx

   b. Press Edit to call up the first digit. Keep pressing Edit to change the digit.

   c. Press Menu to move on to the next digit. Press Edit to change this digit.

   d. Do the same with the other digits. When the setting is correct, press Exit.

      Note: If you try use too small a number for the high limit, the menu will say "Error" and return you to the beginning of this menu.

STEP 11 - Set the address for the serial interface

The serial interface allows the SteadyView to communicate with a host computer. The host computer will need to know which address to use in communicating with each SteadyView unit on the system. Each unit must have a separate, unique address. (The possible addresses include the numbers 0 through 9 and the letters A through Z, for a total of 36 possible addresses.)

If the SteadyView will not be connected to a host computer, or if only one SteadyView will be connected, you can leave the unit with the default address of zero.

If two or more SteadyView units will be connected, you must set each unit for a unique address which is different than zero. (If two or more units are connected, none of the addresses may be zero.)

a. Press Menu to go to the address menu:

    ADDR 0

b. If you want to leave the address setting at zero, press Menu to move on to the next menu. (This is OK if the SteadyView will not be connected to a host computer, or if only one unit will be connected).

c. If you want to change the address setting, press Edit.

d. Press Edit again until you see the address you want.

e. When the setting is correct, press Exit.

f. Press Menu to move on to the next menu.

STEP 12 - Save the settings

a. At this point, you have made all of the set-up adjustments. Press Exit again to get this message:

    Press MENU to store, EDIT to continue, EXIT to abort

b. If you want to go through the settings again, press Edit. To start over from the beginning, press Exit. This will erase the settings. To save the new settings, press Menu. The menu will start to indicate the tension on the web.

5.6   Setup for Foreign Language Operation

The SteadyView unit may be set up to display prompts and information in several foreign languages. The options include German, Spanish, French, and Italian.

The SteadyView unit can be set up for this manually, or by commands from a host computer. For information on setup by the host computer, see Section 6.

If you want to do the setup manually, you must do the special setup procedure <u>before</u> you do the other setup steps listed in Section 5.6. Here is the procedure:

a. Hold down the Menu key as you turn on the power switch on the rear of the SteadyView unit.

b. The display will say:

    English

c. To prepare to change the language, press Edit.

  • Press Edit again to get the language you want. The options are:

    Deutsch   (German)
    Espanol   (Spanish)
    Francais   (French)
    Italiano   (Italian)

  • When the correct language is displayed, press Exit.

  • Press Menu to go to the other steps in the setup.

  • NOTE: Remember to save the settings as mentioned in Section 5.5, Step 12, otherwise the unit will not store the selected language. Once you select a language, the SteadyView will remember this, even if the power to the unit is turned off.

NOTE - It is not necessary to read this section unless the SteadyView will be connected to a remote computer system.

6.1   Introduction

The SteadyView indicator is mainly intended to provide stand-alone, local indication of process tension. However, the unit also includes a serial port. This can be used to assist in initial setup, or to help collect data for a remote computer.

If the SteadyView is communicating with a remote computer, it uses a simple command/ response protocol. This allows the remote computer to control all indicator modes and functions, just as if an operator was working with the control panel. To start the process, the host must transmit a command or query. The SteadyView then responds. The SteadyView cannot initiate a communications sequence by itself. All commands include a unit address for systems in which a single host computer controls a number of remote units, .

The serial port is controlled by a standard UART. The baud rate may be specified by the user.

6.2   Changing the Type of Serial Interface

The SteadyView may be set to use several different serial protocols: RS232, RS422, RS423, or RS485. At the factory, the unit is set for RS232. The unit may be converted for the other protocols by installing optional kits. To make a selection, begin by disassembling the unit as described in section 3.2. Figure 3 shows the two DIP switches mounted inside the unit.

To select RS422 or RS485:

- Install option kit per instructions
- On SW104, positions 3 and 4 open

To select RS423:

- Install option kit per instructions
- On SW104, positions 3 and 4 closed

6.3   Serial Interface Connections

A 9-pin D subminiature connector is provided on the rear panel of the unit. Here are the pin assignments:

1   RxD

2   RxD*

3   TxD*

4   TxD

5   Ground

NOTE - For serial interface RS232 connections, use only pins 2, 3, and 5. In any case, do not make connections to pins other than those required for your chosen interface.

6.4   Default Communications Settings and Host Computer Setup

When the SteadyView is first powered up, the serial port uses some default settings. The first time a remote unit communicates through the serial port, it will have to use these settings:

Baud rate   9600

Data bits   8

Stop bits   1

Parity bits   N

6.5   Command Types and Initial Communications

In the following command descriptions, "#" indicates SteadyView's one-byte ASCII address from 0 through 9 and A through Z. This provides 35 possible addresses (in addition to the "0" address) for multiple unit installations. The factory default address is 0, to which all units respond.

Commands are divided into three categories: Supervisory Level, Run Level, and Menu Level. These are preceded by the characters "*", "$", or "&", respectively.

Supervisory Level Commands can be processed at any time, and consist only of the four commands "*#M", which disables local mode and enables remote mode; "*#L", which disables remote mode and enables local mode; "*#S" which requests operational status, and "*#B", which requests communication parameters. Therefore, aside from status requests, the first command in a host/SteadyView communication sequence must be "*#M", which causes SteadyView to enter Remote Communications mode and to be able to respond to other commands on the serial interface. If SteadyView is in Menu mode while the *#M command is issued, it is forced to exit to Run mode without storing parameters. It is therefore the responsibility of the host to assure that the unit is in Run mode before beginning remote communications to prevent lost information should someone be in the process of programming the unit.

While the unit is in remote mode, the keypad is disabled (with one exception, noted below) in order to avoid conflicts between commands entered locally through the keypad and those entered remotely through the serial interface. Therefore if keypad functionality is to be restored the last command issued during a communications sequence must be *#L.

The SteadyView cannot enter Remote mode through keypad commands. During a remote operating session, the display behaves as if commands were issued through the keypad.

Once Remote mode has been enabled and the SteadyView unit is in Run mode, Run Level commands can be processed by the SteadyView. Run level commands generally consist of requests for data and status inquiries.

Menu Level Commands can only be processed while the SteadyView has been placed into Menu mode by remote access. It is necessary to become familiar with the basic menu structure in order to properly navigate through the menu while in Remote mode.

Whenever the SteadyView receives a command which requires a response specific to that command (an example would be a Comm status request, for which the response would be

comm status), the SteadyView responds with a prefix specific to that command, its address, and then the requested information. In this way the host has confirmation that the SteadyView processed the command correctly and that the data is valid. If the SteadyView receives a command which only requires the SteadyView to process the command, the SteadyView still acknowledges receipt of that command with the ACK (acknowledge) response, "%#A". If the SteadyView receives a command but either does not recognize it, or recognizes it but the command is not appropriate for the menu level, or for any other reason cannot process the command, the SteadyView will acknowledge the receipt of these undefined, unanticipated, or inappropriate commands or command arguments with the NAK (negative acknowledge) response, "%#?".

The user must constrain command arguments, including numeric ranges, to be valid entries, otherwise unpredictable results may occur.

The only keypad activity recognized by the SteadyView while it is in remote mode is a depression of the Exit key which is maintained for five seconds. At the end of the five second period, the SteadyView executes the equivalent of a "&#X" command followed by a "*#L" command (see the command descriptions for more information) which puts the unit back in Local mode. This function provides an escape route to re-enable local mode should serial communications fail.

6.6   Summary of Commands - Host-to-SteadyView Communications

Supervisory Level Commands

*#B	Comm parameter request
*#L	Enter Local mode
*#M	Enter Remote mode
*#S	Operational status request

Run Level Commands

$#B(+6)	Change comm parameters according to the following six bytes
$#D(+8)	Display ASCII text contained in the following eight bytes
$#d	Restore display to normal
$#E	Send cal weight
$#G	Send range
$#H	Send TLS Hi setting
$#J	Send display language
&#J	Set display language
$#L	Send TLS low setting
$#M	Go to Menu mode

Run Level Commands (continued)

$#O(+3)	Send analog output value
$#R	Reset TLS alarm
$#T	Send tension
$#U	Send units
$#V(+3)	Set analog output value
$#W	Send web width

Menu Level Commands

&#c	Go to CAL Prompt
&#C	Begin CAL sequence
&#D(+1)	Set SteadyView address to the number in the subsequent byte and store it in EEPROM
&#E(+6)	Set cal weight
&#G(+4)	Set range according to the following four bytes
&#H(+4)	Set TLS hi setting according to the following four bytes
&#J(+1)	Set display language according to the next byte
&#K(+1)	Set TLS operating mode according to the next byte
&#L(+4)	Set TLS lo setting according to the following four bytes
&#N	Store new parameters in EEPROM and go to Run mode
&#U(+3)	Set Units according to the following three bytes
&#v(+1)	Set analog output operating mode according to the following byte
&#W(+5)	Set web width according to the following five bytes
&#X	Go to Run mode without storing new parameters
&#y	Go to REZERO Prompt
&#Y	Begin REZERO sequence
&#z	Go to Zero Prompt
&#Z	Begin ZERO sequence

Summary of SteadyView-to-Host Responses

%#A	Command receipt acknowledged; command processed correctly
%#B(+7)	Communications status is contained in the next seven bytes
%#C	Calibration sequence complete
%#E(+6)	Cal weight is contained in the next six bytes
%#F	Unable to rezero

SteadyView-to-Host Responses (continued)

%#G(+4)	Range is contained in the next four bytes
%#H(+4)	TLS High setting is contained in the next four bytes
%#J(+1)	Display language code is contained in the next byte
%#L(+4)	TLS Low setting is contained in the next four bytes
%#O(+3)	Analog output value is contained in the next three bytes
%#P	Unable to zero
%#Q	Unable to calibrate
%#S(+7)	Operational status response
%#T(+4)	Tension is contained in the next four bytes
%#U(+3)	Units is contained in the next three bytes
%#W(+5)	Web width is contained in the next five bytes
%#Y	Rezero sequence complete
%#Z	Zero sequence complete
%#?	Command receipt acknowledged; command not processed

6.7   Detailed Description - Supervisory Level Commands

*#M   Enter Remote mode

Causes SteadyView to go to Run mode (if it is not already in Run mode); disable local mode; enter remote mode; disable keypad input; and await further commands.

Response: %#A

*#L   Enter Local mode

Causes SteadyView to disable remote mode and enter local mode.

Response: %#A (if local mode has been entered), %#? (if SteadyView cannot enter local mode)

SteadyView can only enter local mode if it is in Run mode.

*#B   Comm parameter request

Causes SteadyView to respond with bytes containing its present communication parameters.

Response: %#B(+6), where the last six bytes are interpreted as follows:

nnnXXX Baud rate, nnn=

003: 300 baud

012: 1200 baud

024: 2400 baud

048: 4800 baud

096: 9600 baud

XXXnnX Stop bits, nn=

10: 1 stop bit

15: 1.5 stop bits (special)

20: 2 stop bits (special)

XXXXXn Parity, n=

N: None

O: Odd (special)

E: Even (special)

*#S   Operational status request

Causes SteadyView to respond with six bytes containing its present operational status.

Response: %#S(+7), where the last seven bytes are interpreted as follows:

nXXXXX Alarm status, n=

I   TLS alarm inactive

A   TLS alarm active

XnXXXX mode status, n=

R   Run mode

M   Menu mode

E   Edit mode

XXnXXX Comm status, n=

L   Local mode

R   Remote mode

XXXnXX Output status, n=

L   Local mode

R   Remote mode

XXXXnX TLS Status, n=

O   TLS Off

L   TLS Latched mode

M   TLS Momentary mode

XXXXXn Display status, n=

N   Display normal

T   Display text mode

XXXXXXn Range status, n=

+   Over-range

-       Under-range

N   Within range

6.8   Detailed Description - Run Level Commands

$#M   Go to Menu mode
              Causes SteadyView to go into Menu mode, provided SteadyView is not already
              in Menu mode.

Response: %#A (if the command is processed), %#? (if the command was not processed)

$#T   Send Tension
              Causes SteadyView to send the most recent tension value, exactly as it would
              appear on its display.

Response: %#T(+4), where the last four bytes are the ASCII values of the characters ap-
              pearing on the display, most significant character first. If the displayed characters
              include a decimal point, then the ASCII value for a decimal point will be sent in
              that position.

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$#U   Send Units

Causes SteadyView to send the currently specified measurement unit, exactly as it appears on its display.

Response: %#U(+3), where the last three bytes are the ASCII values of the characters appearing on the display, most significant character first. If the displayed characters include a space, then the ASCII value for a space will be sent in that position.

$#G   Send Range

Causes SteadyView to send the currently specified range value, exactly as it would appear on its display.

Response: %#G(+4), where the last four bytes are the ASCII values of the characters which would appear as the range value, most significant character first. If the displayed characters would include a decimal point, then the ASCII value for a decimal point will be sent in that position.

$#W   Send web width

Causes SteadyView to send the currently specified web width value, exactly as it would appear on its display.

Response: %#W(+5), where the last five bytes are the ASCII values of the characters which would appear as the web width, most significant character first, including the decimal point. The format of this value is "xxx.x", which is the same as it would appear on the indicator's display.

$#E   Send Cal weight

Causes SteadyView to send its calibration weight.

Response: %#E(+6), where the last six bytes are the ASCII values of the characters which would appear as the calibration weight, most significant character first, including the decimal point. The format of this value is "xxxx.x", which may contain zeros in positions which would not be shown on the indicator's display.

$#R   Reset TLS Alarm

Causes SteadyView to reset the TLS alarm, if that alarm is set.

Response: %#A (if alarm was active)

%#? (if the alarm was inactive)

Issuing this command has the same effect as pressing the "TLS RESET" key on the indicator's front panel. If one of the indicator's trip points are being exceeded, and its TLS mode is "momentary", then the reset command will have only a momentary effect.

$#L   Send TLS Low Setting

Causes SteadyView to send its current TLS low trip point value.

Response: %#L(+4), where the last four bytes are the ASCII values of the characters which would appear as the TLS Low value, most significant character first. If the displayed characters would include a decimal point, then the ASCII value for a decimal point will be sent in that position.

$#H   Send TLS Hi Setting

Causes SteadyView to send its current TLS high trip point value.

Response: %#H(+4), where the last four bytes are the ASCII values of the characters which would appear as the TLS High value, most significant character first. If the displayed characters would include a decimal point, then the ASCII value for a decimal point will be sent in that position.

$#J   Send display language

Causes SteadyView to respond with a code containing its current display language.

Response: %#J, where the next byte contains the ASCII code for the current display language, to be interpreted as follows:

        0:    Reserved

        1:    English (default)

        2:    German

        3:    Spanish

        4:    French

        5-Z: Reserved

&#J(+1)   Set display language
Sets display language used by SteadyView. The last byte specifies the language:

      0:     Reserved
      1:     English (default)
      2:     German
      3:     Spanish
      4:     French
      5-Z: Reserved

Response: ACK

$#B(+6)   Change comm parameters
Causes SteadyView to change its communication parameters according to the subsequent six bytes, as follows:

      nnnXXXXX   Baud rate, nnn=
      003:   300
      012:   1200
      024:   2400
      048:   4800
      096:   9600

      XXXnnXXX   Stop bits, nn=
      10:    1 stop bit
      15:    1.5 stop bits (special)
      20:    2 stop bits (special)

      XXXXXn Parity, nn=
      N: None
      O: Odd (special)
      E: Even (special)

Response: %#A (if command is to be processed)
%#? (if command cannot be processed)
Because of the nature of the action of this command, the response must be sent using the existing parameters, while all subsequent communications will be performed with the new settings.

$#D(+8)	Display ASCII text
Response:	%#A (if the command is processed)
	%#? (if the command cannot be processed)

Causes SteadyView to stop displaying tension and instead display the ASCII text contained in the following 8 bytes. The display will continue to show this message until another message is sent, or until a $#d command is issued.

$#d	Restore the display to normal
	Causes SteadyView to revert to its original display, i. e. display of tension.
Response:	%#A (if the command is processed)
	%#? (if the command cannot be processed)

$#O	Send analog output value
	Causes SteadyView to respond with the value sent to the DAC which produces the current analog output.
Response:	%#O(+3), where the three bytes are ASCII representations of the hex values and are interpreted most significant nibble first, least significant nibble last. Data is arranged such that FFF represents maximum DAC output and 000 represents minimum DAC output.
	Example: A response of %#O7FF represents the middle of the DAC's output range and would produce a SteadyView output voltage of 0V (in voltage mode) or 0mA (in current mode).
$#V(+3)	Set analog output value according to the following three bytes (only will be processed when in remote output mode)
Response:	%#A (if the command is processed)
	%#? (if the command cannot be processed)

6.9   Detailed Description - Menu Level Commands

&#K(+1)   Set TLS operating mode according to the next byte:

                n TLS mode, n=

                O TLS off

                L TLS latched alarm

                M TLS momentary alarm

Response: %#A (if the command is processed)

             %#? (if the command cannot be processed)

&#U(+3)   Set units according to the following three bytes, as follows:

                nnn Units, nnn=

lb	pounds
oz	ounces
gm	grams
N	Newtons
PLI	pounds per lineal inch
ozi	ounces per lineal inch
gcm	grams per lineal centimeter
Ncm	Newtons per lineal centimeter

Response: %#A (if the command is processed)

             %#? (if the command cannot be processed)

&#G(+4)   Set range according to the following four bytes

Response: %#A (if the command is processed)

             %#? (if the command cannot be processed)

&#E(+6)   Set calibration weight according to the following six bytes

The calibration weight is specified in the format "xxxx.x", but because the indicator only accepts three digits plus a decimal point, two of the first or the last positions must be zeros.

&#z   Go to Zero Prompt

Response: %#A (if the command is processed)

             %#? (if the command cannot be processed)

Depending on where the indicator is within the menu structure, it may not be possible for it to process this command.

&#Z   Begin ZERO sequence

Response: %#? if the command cannot be processed,

%#Z when zeroing is complete, or

%#P if unable to zero

Depending on where the indicator is within the menu structure, it may not be possible for it to process this command.

&#c   Go to CAL Prompt

Response: %#A (if the command is processed)

%#? (if the command cannot be processed)

Depending on where the indicator is within the menu structure, it may not be possible for it to process this command.

&#C   Begin CAL sequence

Response: %#? if the command cannot be processed,

%#C when complete, or

%#Q if unable to calibrate

Depending on where the indicator is within the menu structure, it may not be possible for it to process this command.

&#y   Go to REZERO Prompt

Response: %#A (if the command is processed)

%#? (if the command cannot be processed)

Depending on where the indicator is within the menu structure, it may not be possible for it to process this command.

&#Y   Begin REZERO sequence

Response: %#? if the command cannot be processed,

%#Y when complete, or

%#F if unable to zero

Depending on where the indicator is within the menu structure, it may not be possible for it to process this command.

&#L(+4)   Set TLS Lo Setting

Response: %#A (if the command is processed)

%#? (if the command cannot be processed)

The TLS LO setting must be appropriate for the specified range value.

&#J(+1)   Set display language

Causes SteadyView to change its display language according to the ASCII code

in the next byte, to be interpreted as follows:

      0: No change

      1: English (default)

      2: German

      3: Spanish

      4: French

      5-Z: Reserved

Response: %#A (if the command is processed)

%#? (if the command cannot be processed)

This command takes effect immediately, but applies only to scrolled prompt and

error messages.

&#H(+4)   Set TLS Hi Setting

Response: %#A (if the command is processed)

%#? (if the command cannot be processed)

The TLS HI setting must be appropriate for the specified range value.

&#D(+1)   Set SteadyView address to number in subsequent byte and store in EEPROM

Response: %#A (if the command is processed)

%#? (if the command cannot be processed)

The value contained in the subsequent byte is interpreted as a binary value

whose value is between 0 and 255.

&#X   Go to Run mode without storing new parameters

Response: %#A (if the command is processed)

%#? (if the command cannot be processed)

&#N   Store new parameters and go to Run mode
Response: %#A (if the command is processed)
            %#? (if the command cannot be processed)

$#v(+1)   Set analog output operating mode according to the next byte:
            n Analog mode, n= R Remote mode: analog output is according to data sent
            over the serial interface
            L Local mode: analog output is proportional to tension
Response: %#A (if the command is processed)
            %#? (if the command cannot be processed)

SECTION 7   CLEANING AND MAINTENANCE

The SteadyView unit requires very little maintenance. If necessary, clean the membrane on the front panel using a small amount of a gentle solvent like Windex®. Do not use strong petroleum-based solvents - these could damage the panel material. Do not use large amounts of water.

8.1   Error Messages on the Display

Error

This message can appear while you are setting up the Tension Limit Switch. For example, if you try to set a low limit which is above the high limit, the SteadyView will not accept the value. The SteadyView will also resist if you try to set a high limit which is above the high end of the range selected for the unit. To recover, set the high or low limit correctly.

Invalid units

This message can appear if you set up the range, then later change the units used by the display (lb, gm, etc.). Generally, if you change the units setting, the other settings will translate to the new units automatically. The "Invalid units" message will appear if this translation would result in a number which would be out of range for the display.

Unable to zero

This message may appear if, during zeroing, the output from the transducers is equal to 95% of the full range of the indicator. (After zeroing, this would only allow the indicator to use 5% of the range.) Before zeroing, be sure the web and any other weights have been removed from the sensor roll. Also be sure the range has been set correctly.

This message can also appear if there is a lot of variation in the signals from the transducers while the SteadyView is trying to zero. This could be caused by some sort of weight or load on the sensor roll, or by a problem with the transducers or connecting cables. If necessary, check for a hardware problem by substituting the transducers and cables. This symptom could also be caused by a faulty power supply for the transducer excitation voltage.

Unable to calibrate

This message may appear if the setting for the calibration point is not logical (below the zero point). During calibration, be sure to set the calibration weight correctly. Attach the weight as shown in Fig. 6.

This message can also appear if there is a lot of variation in the signals from the transducers while the SteadyView is trying to calibrate. This could be caused by a problem with the transducers or connecting cables.

Unable to rezero

This message may appear if, during rezeroing, the output from the transducers is equal to 95% of the full range of the indicator. (After rezeroing, this would only allow the indicator to use 5% of the range.) Before rezeroing, be sure the web and any other weights have been removed from the sensor roll. Also be sure the range has been set correctly.

This message can also appear if there is a large difference between the original zero value and the value determined during rezeroing. This could be caused by a variation in the signals from the transducers while the SteadyView is trying to rezero. Check for an extra weight or load on the sensor roll, or for a problem with the transducers or connecting cables.

If necessary, check for a hardware problem by substituting the transducers and cables. This symptom could also be caused by a faulty power supply for the transducer excitation voltage.

8.2   Other Error Conditions

Analog output not working correctly:

If you have chosen the 0-10V voltage output, and the voltage is not present, check for a short-circuit or very low impedance in the circuit to the remote indicator.

If you have chosen 0-20 mA or 4-20mA current-loop output, and the remote indicator does not go through the full range, check for a very low impedance in the circuit to the remote indicator.

If the SteadyView indication remains at a very high or low value:

One side of the transducer signal may not be reaching the SteadyView. Check the transducer cables and all connections.

If the SteadyView indication remains at a medium value:

The transducers may not be connected. Check the transducer cables and all connections.

If there is no display on the SteadyView:

Check the AC connections to the terminals on the back panel of the SteadyView. Check the fuses inside the unit (See Fig. 3). There may also be a problem with the 5V power supply inside the unit.

If the unit does not operate, and the three LED's flash in sequence:

This will happen if the memory for the unit has been erased. You can do this by pressing the Menu, Edit and Exit keys for 5 seconds. The unit will not operate until you re-enter the setup values.

If the Tension Limit Switch is not operating:

Check to be sure the operating mode has been set correctly (momentary or latching). Check that the high and low trip points have been set correctly. The relay for this function may be set up for either normally-open or normally-closed action. Check the terminals on the rear panel of the SteadyView.

TERMS AND CONDITIONS OF SALE AND SHIPMENT

1. THE COMPANY   5/1/00

Dover Flexo Electronics, Inc. is hereinafter referred to as the Company.

2. CONFLICTING OR MODIFYING TERMS

No modification of, additions to or conflicting provisions to these terms and conditions of sale and shipment, whether oral or written, incorporated into Buyer's order or other communications are binding upon the Company unless specifically agreed to by the Company in writing and signed by an officer of the Company. Failure of the Company to object to such additions, conflicts or modifications shall not be construed as a waiver of these terms and conditions nor an acceptance of any such provisions.

3. GOVERNING LAW

This contract shall be governed by and construed according to the laws of the state of New Hampshire, U.S.A. The parties agree that any and all legal proceedings pursuant to this contract shall take place under the jurisdiction of the courts of the State of New Hampshire in the judicial district of Strafford County.

4. PENALTY CLAUSES

Penalty clauses of any kind contained in orders, agreements or any other type of communication are not binding on the Company unless agreed to by an officer of the Company in writing.

5. WARRANTY

Dover Flexo Electronics, Inc. warrants its' products to be free of defects in material and workmanship for five years from date of original shipment. Warranty is valid on products purchased on or after April 2, 1999. During the warranty period the Company will repair or replace defective products free of charge if such products are returned with all shipping charges prepaid and if, upon examination, the product is shown to be defective. This warranty shall not apply to products damaged by abuse, neglect, accident, modification, alteration or mis-use. Normal wear is not warranteed. All repairs and replacements under the provisions of this warranty shall be made at Dover Flexo Electronics or at an authorized repair facility. The Company shall not be liable for expenses incurred to repair or replace defective products at any other location or by unauthorized persons or agents. This warranty contains all of the obligations and warranties of the Company. There are no other warranties, either expressed or implied. No warranty is given regarding merchantability or suitability for any particular purpose. The Company shall not be liable in either equity or law for consequential damages, losses or expenses incurred by use of or inability to use its' products or for claims arising from same. No warranty is given for products of other manufacturers even though the Company may provide these products with its' own or by themselves. The provisions of this warranty can not be changed in any way by any agent or employee of the Company. Notice of defects must be received within the warranty period or the warranty is void.

6. PAYMENTS

Standard terms of credit are net 30 days from date of shipment, providing satisfactory credit is established with the Company. Amounts past due are subject to a service charge of 1.5% per month or portion thereof or 18% per annum. The Company reserves the right to submit any unpaid late invoices to a third party for collection and Buyer shall pay all reasonable costs of such collection in addition to the invoice amount. All quoted prices and payments shall be in U.S. Dollars.

If the Company judges that the financial condition or payment practices of the Buyer does not justify shipment under the standard terms or the terms originally specified, the Company may require full or partial payment in advance or upon delivery. The Company reserves the right to make collection on any terms approved in writing by the Company's Finance Department. Each shipment shall

be considered a separate and independent transaction and payment therefore shall be made accordingly. If the work covered by the purchase order is delayed by the Buyer, upon demand by Company payments shall be made on the purchase price based upon percentage of completion.

7. TAXES

Any tax, duty, custom, fee or any other charge of any nature whatsoever imposed by any governmental authority on or measured by any transaction between the Company and the Buyer shall be paid by the Buyer in addition to the prices quoted or invoiced.

8. RETURNS

Written authorization must be obtained from the Company's factory before returning any material for which the Buyer expects credit, exchange, or repairs under the Warranty. Returned material (except exchanges or repairs under the Warranty) shall be subject to a minimum re-stocking charge of 15%. Non-standard material or other material provided specially to the Buyer's specification shall not be returnable for any reason. All material returned, for whatever reason, shall be sent with all freight charges prepaid by the Buyer.

9. SHIPPING METHOD AND CHARGES

All prices quoted are F.O.B. the Company's factory. The Company shall select the freight carrier, method and routing. Shipping charges are prepaid and added to the invoice of Buyers with approved credit, however the Company reserves the right to ship freight-collect if it prefers. Shipping charges will include a charge for packaging. Company will pay standard ground freight charges for items being returned to Buyer which are repaired or replaced under the Warranty.

10. CANCELLATION, CHANGES, RESCHEDULING

Buyer shall reimburse Company for costs incurred for any item on order with the Company which is canceled by the Buyer. Costs shall be determined by common and accepted accounting practices. A one-time hold on any item ordered from the Company shall be allowed for a maximum of 30 days. After 30 days, or upon notice of a second hold, Company shall have the right to cancel the order and issue the appropriate cancellation charges which shall be paid by Buyer. Items held for the Buyer shall be at the risk and expense of the Buyer unless otherwise agreed upon in writing. Company reserves the right to dispose of canceled material as it sees fit without any obligation to Buyer.

If Buyer makes, or causes to make, any change to an order the Company reserves the right to change the price accordingly.

11. PRICES

Prices published in price lists, catalogs or elsewhere are subject to change without notice and without obligation. Written quoted prices are valid for thirty days only.

12. EXPORT SHIPMENTS

Payment for shipments to countries other than the U.S.A. and Canada or to authorized distributors shall be secured by cash in advance or an irrevocable credit instrument approved by an officer of the Company. An additional charge of 10% will apply to any letter of credit. There will be an extra charge for packaging and documentation.

13. CONDITION OF EQUIPMENT

Buyer shall keep products in good repair and shall be responsible for same until the full purchase price has been paid.

14. OWNERSHIP

Products sold are to remain the property of the Company until full payment of the purchase price is made.

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