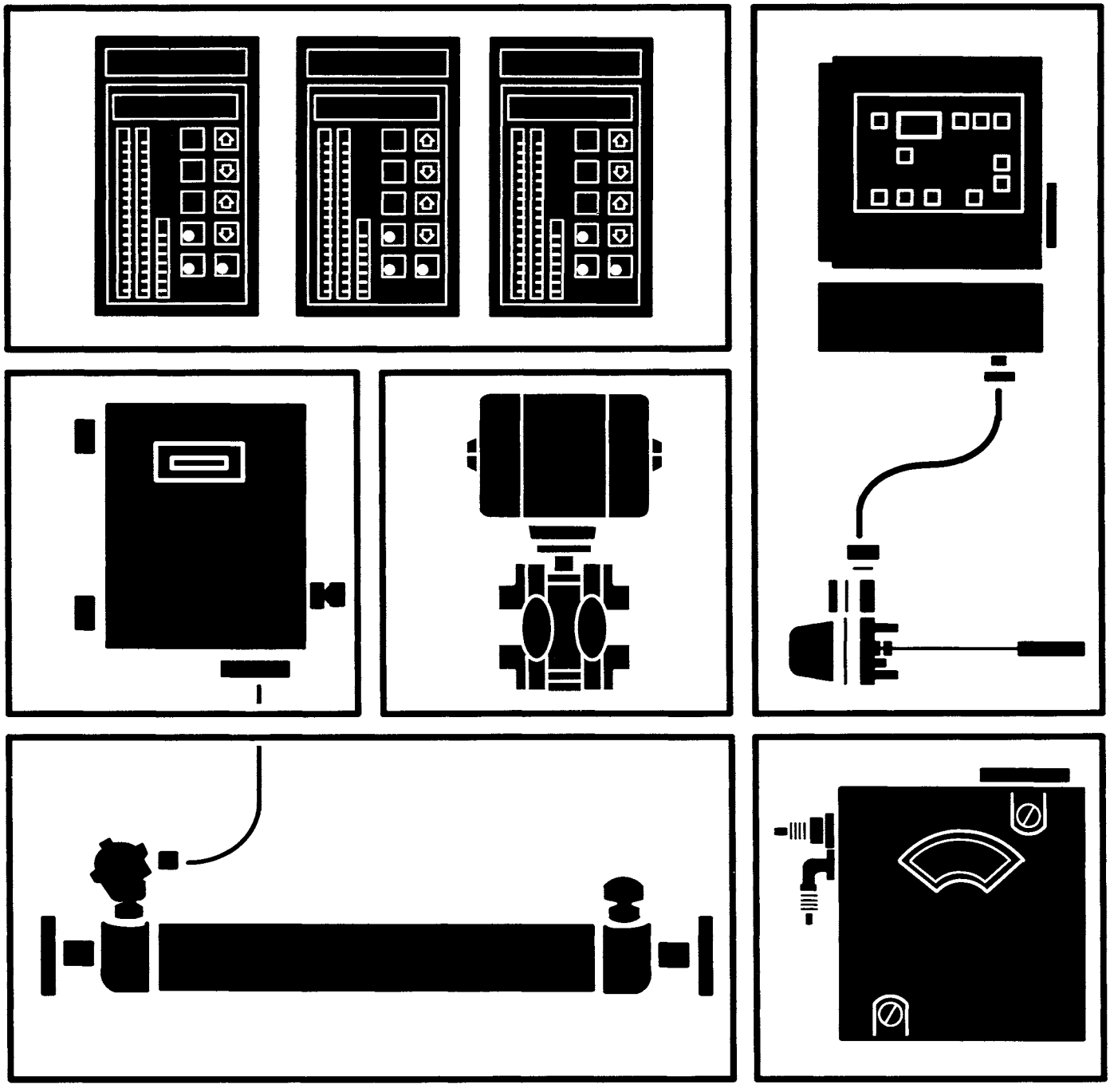
PRODUCT INSTRUCTION

E21-28

Smart Transmitter Terminal

Type STT02



ABB

WARNING notices as used in this manual apply to hazards or unsafe practices which could result in personal injury or death.

CAUTION notices apply to hazards or unsafe practices which could result in property damage.

NOTES highlight procedures and contain information which assist the operator in understanding the information contained in this manual.

WARNING

INSTRUCTION MANUALS

DO NOT INSTALL MAINTAIN OR OPERATE THIS EQUIPMENT WITHOUT READING, UNDERSTANDING AND FOLLOWING THE PROPER **Bailey Controls** INSTRUCTIONS AND MANUALS, OTHERWISE INJURY OR DAMAGE MAY RESULT.

RADIO FREQUENCY INTERFERENCE

MOST ELECTRONIC EQUIPMENT IS INFLUENCED BY RADIO FREQUENCY INTERFERENCE (RFI). CAUTION SHOULD BE EXERCISED WITH REGARD TO THE USE OF PORTABLE COMMUNICATIONS EQUIPMENT IN THE AREA AROUND SUCH EQUIPMENT. PRUDENT PRACTICE DICTATES THAT SIGNS SHOULD BE POSTED IN THE VICINITY OF THE EQUIPMENT CAUTIONING AGAINST THE USE OF PORTABLE COMMUNICATIONS EQUIPMENT.

POSSIBLE PROCESS UPSETS

MAINTENANCE MUST BE PERFORMED ONLY BY QUALIFIED PERSONNEL AND ONLY AFTER SECURING EQUIPMENT CONTROLLED BY THIS PRODUCT. ADJUSTING OR REMOVING THIS PRODUCT WHILE IT IS IN THE SYSTEM MAY UPSET THE PROCESS BEING CONTROLLED. SOME PROCESS UPSETS MAY CAUSE INJURY OR DAMAGE.

AVERTISSEMENT

MANUELS D'OPERATION

NE PAS METTRE EN PLACE REPARER OU FAIRE FONCTIONNER CE MATERIEL SANS AVOIR LU, COMPRIS ET SUIVI LES INSTRUCTIONS REGLEMENTAIRES DE **Bailey Controls** TOUTE NEGLIGENCE A CET EGARD POURRAIT ETRE UNE CAUSE D'ACCIDENT OU DE DEFAILLANCE DU MATERIEL.

PERTURBATIONS DE LA FREQUENCE RADIOPHONIQUE

LA PLUPART DES EQUIPEMENTS ELECTRONIQUES SONT SENSIBLES AUX PERTURBATIONS DE LA FREQUENCE RADIO. DES PRECAUTIONS DEVRONT ETRE PRISES LORS DE L'UTILISATION DE MATERIEL DE COMMUNICATION PORTATIF. LA PRUDENCE EXIGE QUE LES PRECAUTIONS A PRENDRE DANS CE CAS SOIENT SIGNALEES AUX ENDROITS VOULUS DANS VOTRE USINE.

PERTES ROCEDE RENVERSEMENTS

L'ENTRETIEN DOIT ETRE ASSURE PAR UN PERSONNE QUALIFIE ET EN CONSIDERATION DE L'ASPECT SECURITAIRE DES EQUIPMENTS CONTROLES PAR CE PRODUIT. L'ADJUSTMENT ET/OU L'EXTRATION DE CE PRODUIT LORSQU'IL EST INSERE A UN SYSTEME ACTIF PEUT OCCASIONNER DES A-COUPS AU PROCEDE CONTROLE. SUR CERTAINS PROCEDES, CES A-COUPS PEUVENT EGALEMENT OCCASIONNER DES DOMMAGES OU BLESSURES.

NOTICE

The information contained in this document is subject to change without notice.

Bailey Controls Company, its affiliates, employees, and agents, and the authors of and contributors to this publication specifically disclaim all liabilities and warranties, express and implied (including warranties of merchantability and fitness for a particular purpose), for the accuracy, currency, completeness, and /or reliability of the information contained herein and/or for the fitness for any particular use and/or for the performance of any material and/or equipment selected in whole or part with the user of/or in reliance upon information contained herein. Selection of materials and/or equipment is at the sole risk of the user of this publication.

Preface

The information in this publication is offered as a guide for technical personnel responsible for the installation and operation of the Bailey Type STT02 Smart Transmitter Terminal. This document is intended as a supplement to the product instructions for all Bailey products and modules that are used with the Type STT02 Smart Transmitter Terminal. The STT02 is designed to operate with Bailey's FSK (Frequency Shift Keying) line of Smart Transmitters, and replaces the Baseband, STT01 (I-E21-27) Smart Transmitter Terminal.

STT02 software is revised by Bailey Controls Company as enhancements are added. The following list indicates the current software revision and the new device(s) supported by that revision. All previously supported devices are also covered by the latest software revision. The software level of the STT02 is displayed when the unit is first powered-up.

STT02 SOFTWARE REVISION LEVEL	ADDRESSABLE DEVICES (SMART)
A_0	BC1 through BC7, BCN1 through BCN7, EQ, ASI, PH, PH-ORP, DM, VF.
A_1	EQN.

Throughout this Product Instruction, the product or module being used with the STT02 will be referred to as the Target Device. Refer to **Reference Documents** for a list of the target devices and their applicable Product Instruction document numbers. The user should thoroughly read and understand the information in this document before attempting to operate the equipment.

NOTE: The Bailey Controls Company recommends that this Product Instruction be retained for future reference as needed.

List of Effective Pages

Total number of pages in this manual is 117, consisting of the following:

Page No.	Change No.
Preface	Original
List of Effective Pages	Original
iii through vii	Original
1-1 through 1-3	Original
2-1 through 2-2	Original
3-1 through 3-2	Original
4-1 through 4-27	Original
5-1 through 5-2	Original
6-1 through 6-6	Original
A-1 through A-8	Original
B-1 through B-8	Original
C-1 through C-12	Original
D-1 through D-8	Original
E-1 through E-3	Original
F-1 through F-10	Original
G-1 through G-10	Original
H-1 through H-9	Original

When an update is received, insert the latest changed pages and dispose of the superseded pages.

NOTE: On an update page, the changed text or table is indicated by a vertical bar in the outer margin of the page adjacent to the changed area. A changed figure is indicated by a vertical bar in the outer margin next to the figure caption. The date the update was prepared will appear under the page number.

Table of Contents

Page

SECTION 1 — INTRODUCTION 1-1
EQUIPMENT DESCRIPTION 1-1
EQUIPMENT APPLICATION 1-1
INSTRUCTION CONTENT 1-1
HOW TO USE THIS MANUAL 1-2
REFERENCE DOCUMENTS 1-2
SPECIFICATIONS 1-3
OPTIONS AND ACCESSORIES 1-3
CERTIFICATION 1-3

SECTION 2 — DESCRIPTION and OPERATION 2-1
INTRODUCTION 2-1
FUNCTIONAL OPERATION 2-1
PHYSICAL OPERATION 2-1

SECTION 3 — INSTALLATION 3-1
INTRODUCTION 3-1
UNPACKING and INSPECTION 3-1
SETUP and PHYSICAL INSTALLATION 3-1
Charging STT02 3-1

SECTION 4 — OPERATING PROCEDURES 4-1
INTRODUCTION 4-1
OPERATOR/INTERFACE CONTROLS 4-1
Initial Start-Up 4-4
CONFIGURATION FUNCTIONS 4-5
New and Modify Configuration Procedure 4-5
Changing Working Configurations (Connected Target Device) 4-9
Changing Working Configurations (No Target Device) 4-10
Erase Configuration Procedure 4-11
Get Configuration Procedure 4-12
Send Configuration Procedure 4-14
View Configuration Procedure 4-15
CALIBRATION FUNCTIONS 4-16
Bench Calibration 4-16
Rerange Procedure 4-18
OPERATIONAL FUNCTIONS 4-20
Special Feature Key 4-20
Fix Output Procedure 4-20
Cancel Fix Output Procedure 4-21
LCD Setup Procedure 4-22
Monitor Target Device Input Procedure 4-23
Monitor Target Device Output Procedure 4-24
Monitor Secondary Units Output Procedure 4-25
Temperature Function Procedure 4-26
Status Check Procedure 4-27

Table of Contents (continued)

Page

SECTION 5 — TROUBLESHOOTING *5-1*
INTRODUCTION 5-1
ERROR MESSAGES AND CORRECTIVE ACTION 5-1

SECTION 6 — REPAIR/REPLACEMENT *6-1*
INTRODUCTION 6-1
SPECIAL HANDLING PROCEDURES FOR MOS DEVICES 6-1
DISASSEMBLY OF STT02 CASE ASSEMBLY 6-2
REPLACING STT02 EPROM 6-2
REPLACING BATRAM 6-4
REPLACING RECHARGEABLE BATTERIES 6-4
REASSEMBLING THE STT02 CASE ASSEMBLY 6-5
RECOMMENDED SPARE PARTS FOR STT02 6-6

APPENDIX A — TYPE BCN SMART ELECTRONIC PRESSURE TRANSMITTERS *A-1*
INTRODUCTION A-1
CALIBRATION PROCEDURES A-2
D-TO-A Adjust Procedure A-2
Bench Calibration Procedure A-3
Rezero procedure A-6

APPENDIX B — TYPE EQN SMART ELECTRONIC TEMPERATURE TRANSMITTER . . *B-1*
INTRODUCTION B-1
CONFIGURATION PROCEDURE B-2
CALIBRATION PROCEDURE B-5
Bench Calibration B-5

APPENDIX C — TYPE BC SMART ELECTRONIC PRESSURE TRANSMITTER BASEBAND OPERATION *C-1*
INTRODUCTION C-1
CONFIGURATION PROCEDURE C-3
CALIBRATION PROCEDURES C-5
Bench Calibration Procedure C-5
Rezero Procedure C-7
Square Root Procedure C-8
Manifold Procedure (SPECIAL FEATURE) C-8
Temperature Coefficient Display Procedure C-9
Temperature Coefficient Input Procedure C-10

APPENDIX D — TYPE EQ SMART ELECTRONIC TEMPERATURE TRANSMITTER . . . *D-1*
INTRODUCTION D-1
CONFIGURATION PROCEDURE D-2
CALIBRATION PROCEDURES D-3
D-to-A Adjustment Procedure D-4
Bench Calibration Procedure D-5

Table of Contents (continued)

Page

APPENDIX E — NETWORK 90 ANALOG SLAVE INPUT MODULE E-1
INTRODUCTION E-1

APPENDIX F — TYPE pH SMART ELECTRONIC TRANSMITTER (pH MEASUREMENT) F-1
INTRODUCTION F-1
CONFIGURATION PROCEDURE F-3
CALIBRATION PROCEDURES F-5
Bench Calibration Procedure F-5
Process Calibration Procedure F-7

APPENDIX G — TYPE pH SMART ELECTRONIC TRANSMITTER (ORP/SPECIFIC ION MEASUREMENT) G-1
INTRODUCTION G-1
CONFIGURATION PROCEDURE G-3
CALIBRATION PROCEDURES G-5
Bench Calibration Procedure G-5
Process Calibration Procedure G-7

APPENDIX H — TYPE DM DIRECT MASS FLOWMETER H-1
INTRODUCTION H-1
CONFIGURATION PROCEDURE H-3
CALIBRATION PROCEDURE H-6

List of Tables

No.	*Title*	*Page*
4-1.	STT02 Keypad Functions	4-2
4-2.	STT02 Function Groupings	4-3
4-3.	STT02 Scroll Characters	4-3
5-1.	Error Messages	5-1

List of Illustrations

No.	Title	Page
2-1.	Point-to-Point Wiring	2-1
2-2.	Field Bus Wiring	2-2
6-1.	STT02 Internal Component Locations	6-3
A-1.	Configuration/Rerange Flow Chart (Smart BCN Pressure Transmitter)	A-7
A-2.	Calibration Flow Chart (Smart BCN Pressure Transmitter)	A-8
B-1.	Configuration Flow Chart (Smart EQN Temperature Transmitter)	B-7
B-2.	Calibration Flow Chart (Smart EQN Temperature Transmitter)	B-8
C-1.	Configuration Flow Chart (Smart BC Pressure Transmitter)	C-11
C-2.	Calibration Flow Chart (Smart BC Pressure Transmitter)	C-12
D-1.	Configuration Flow Chart (Smart EQ Temperature Transmitter)	D-7
D-2.	Calibration Flow Chart (Smart EQ Temperature Transmitter)	D-8
F-1.	Configuration Flow Chart (Type PH Smart Transmitter -pH Measurement)	F-9
F-2.	Calibration Flow Chart (Type PH Smart Transmitter - pH Measurement)	F-10
G-1.	Configuration Flow Chart (Type PH Smart Transmitter - ORP/Specific Ion Measurement)	G-9
G-2.	Calibration Flow Chart (Type PH Smart Transmitter - ORP/Specific Ion Measurement)	G-10
H-1.	Configuration Flowchart (Type DM Direct Mass Flowmeter)	H-8
H-2.	Calibration Flowchart (Type DM Direct Mass Flowmeter)	H-9
H-3.	Rerange Procedure Flowchart (Type DM Direct Mass Flowmeter)	H-9

Safety Summary

SPECIFIC WARNING	Non-rechargeable batteries may explode or leak if recharged. This unit contains six rechargeable batteries. If battery replacement is required replace all batteries at same time and only with rechargeable type. To prevent ignition of a hazardous atmosphere, batteries must only be changed or recharged in an area known to be non-hazardous. (p. 3-1, 6-5)

Sommaire de Securite

AVERTISSEMENT D'ORDRE SPECIFIQUE	Les piles non-rechargeable peuvent exploser ou couler si rechargees. Cet ensemble comprend six piles rechargables. Si le remplacement dune pile est requis. Replacertoutes les piles en meme temps en utilisant des piles de type rechargeable seulement. Les piles ne doivent etre remplacees que dans un endroit ou le danger est manifestement inexistant. (p. 3-1, 6-5)

SECTION 1 — INTRODUCTION

EQUIPMENT DESCRIPTION

The STT02 Smart Transmitter Terminal is a battery powered, portable communication device designed for use with Bailey's line of Smart Electronic Instrumentation. The STT02 terminal allows the user to configure, calibrate, modify, troubleshoot, or verify the operation of the target device from various remote locations.

The terminal has 32 keys, 12 of which are used in a numeric keypad. Four of the keys are cursor keys. There are ten operation keys which allow the user to follow step-by-step procedures for performing various functions. In addition there are two function keys, one is for future use and the other used to display the battery charge.

The STT02 will operate for approximately 24 hours when fully charged on six AA NiCd rechargeable batteries. The approximate operation time left on the batteries can be displayed on the STT02 screen. A battery charger is included with each STT02. Information in the internal non-volatile memory (BATRAM) is maintained for approximately 10 years.

EQUIPMENT APPLICATION

The STT02 is designed for use with Bailey's complete line of new family Smart Devices, which include the Smart BCN Transmitters and the EQN Smart Temperature Transmitter. The STT02 is also capable of operating as a STT01, allowing it to interface with Bailey's Baseband Transmitters (BC, EQ, DM, PH, PH/ORP and ASI).

NOTE: To use STT02 with baseband devices, optional Adapter Cable Kit, Bailey Part No.258445_1, is required.

INSTRUCTION CONTENT

Description and Operation Describes the STT02 operating modes, and communication method.

Installation This section presents information on making the STT02 operational. Procedures detailed here are: unpacking, setup and charging.

Operating Procedures This section describes the numeric key pad and the function keys located on the STT02. Procedures are detailed that step the user through Configuration, Calibration, and various Output functions.

Troubleshooting Error messages pertaining to the STT02 are listed, as are the causes and steps for correction.

Repair/Replacement Provides user with handling and disassembly procedures for various STT02 components, along with a spare parts list.

Appendices These are provided in the back of the manual for each target device. They are intended to supplement the general calibration procedures with details that are exclusive to a particular device. Flow charts are provided for configuration and calibration.

HOW TO USE THIS MANUAL

Example procedures are provided for the STT02; first general examples introduce the various functions of the STT02. Secondly, specific examples are illustrated in the appendices as they relate to each target device. Use the examples as a guide to operation.

REFERENCE DOCUMENTS

Smart Electronic Pressure Transmitter, Type BCN1, Product Instruction I-E21-31.

Smart Electronic Pressure Transmitter, Type BCN2/3/4/5/6, Product Instruction I-E21-32.

Smart Electronic Level Transmitter, Type BCN7, Product Instruction I-E21-37.

Smart Temperature Transmitter, Type EQN, Product Instruction I-E51-79.

Type BC1 Smart Transmitter Product Instruction, I-E21-26-10.

Smart Transmitter Product Instruction, Type BC2/3/4/5/6, I-E21-26-18.

Smart Electronic Gage Pressure Transmitter, Type BC58/59, I-E21-26-12.

Type BC7 Smart Transmitter Product Instruction, I-E31-26-10.

Type EQ Smart Temperature Transmitter, Product Instruction, I-E51-78-1.

NETWORK 90 Analog Slave Input Module, Type NASI01 Product Instruction, I-E93-912-9.

Type PH/ORP Smart Transmitter Product Instruction, I-E67-20.

Type DM Direct Mass Flowmeter Product Instruction, I-E22-37.

Field Bus Slave Module, IMFBS01 Product Instruction I-E96-302.

SPECIFICATIONS

Display Format	
Type:	LCD
Number of Rows:	4
Characters per Row:	16
Configuration Storage Capacity	75 configurations
Keyboard Type	Tactile feedback embossed membrane; 32 keys
Cable Length	6 ft. (1.8 m) from STT02
Temperature Limits	
Operating:	32° to 122°F (0° to 50°C)
Storage:	-4° to 158°F (-20° to 70°C)
Humidity Limits	95%, non-condensing
Batteries	
Type:	Six AA NiCd rechargeables
Continuous Run Time:	24 hours
Charge Time:	48 hours
Weight	24 oz. (680 g)
Dimensions (hxwxd)	7.75 x 4.30 x 2.00 in. (197 x 110 x 51 mm)
Case Material	Plastic, Polycarbonate (Lexan 940® or equivalent)

OPTIONS AND ACCESSORIES

Configuration Cartridge	A cartridge used to expand configuration memory, Bailey Kit No. 258474_1.
Baseband Communication Cable	Communication cable allowing STT02 to operate with baseband line of devices - BC, EQ, PH, PH/ORP, DM and ASI. Bailey Kit No. 258445_1.
Anti-static Kit	Contains static-dissipative work surface and ground cord assembly (wrist bands and alligator clips). Bailey Part No. 1948385_1.
Battery Charger	Used to recharge AA NiCd rechargeable batteries, (120 V ac, 50-60 Hz) Bailey Part No. 1948580_1.

CERTIFICATION

STT02 Factory Mutual (FM) and Canadian Standards Association (CSA) approval and certification pending in the following categories:
Non-incendive: Class I; Division 2; Groups A - D.
Intrinsically Safe when target device is used with an approved intrinsic safety barrier: Class I; Division 1; Groups A - D.

LEXAN® - Registered trademark of General Electric Co., Noryl Products Dept.

SECTION 2 — DESCRIPTION and OPERATION

INTRODUCTION

This section provides a description of the operational modes and contains instructions for the wiring connections between the target device and the STT02.

FUNCTIONAL OPERATION

The STT02 Smart Transmitter Terminal operates with a target device by attaching clips leads from the STT02 to the signal wires of the target device. Communication is performed over the signal wires and can support up to 15 transmitters when configured to operate with the Bailey Digital Field Bus. The target device and STT02 communicate by using Frequency Shift Keying (FSK). FSK is a form of frequency modulation used for digital communication. The communication signal is a high frequency AC signal with a DC average of zero. Therefore, digital communication and process variable output can occur simultaneously.

PHYSICAL OPERATION

The STT02 connects to the target device anywhere there is access to the signal leads. The clip leads connect across the signal leads independent of signal direction or polarity. (see Figure 2-1 and 2-2).

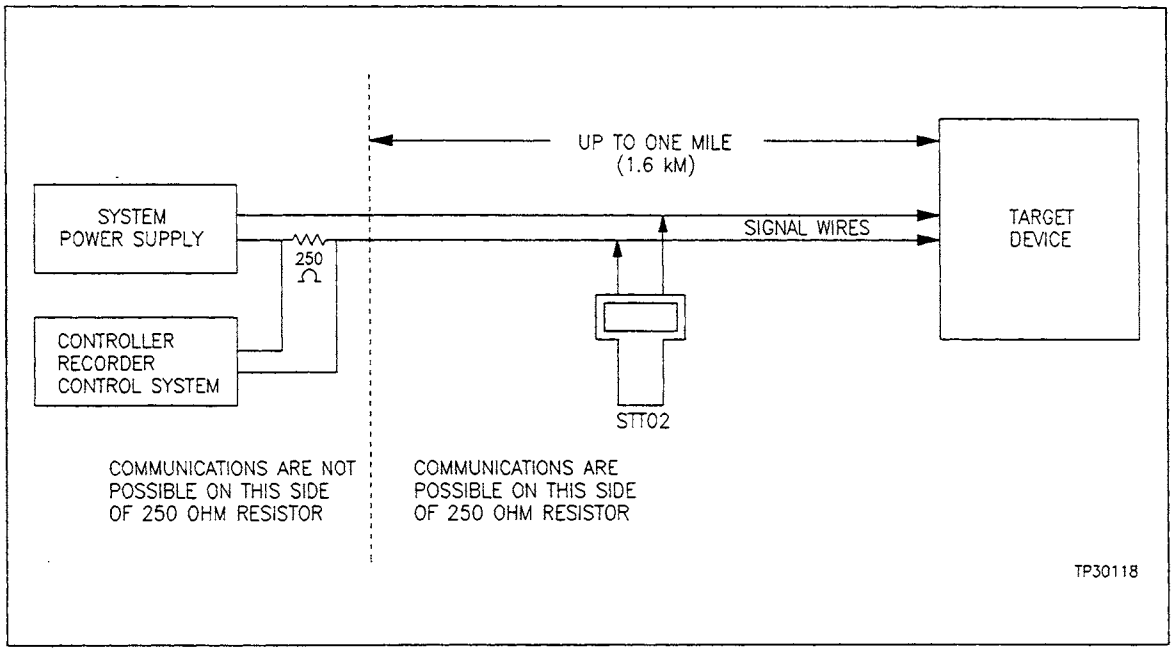


Figure 2-1. Point-to-Point Wiring

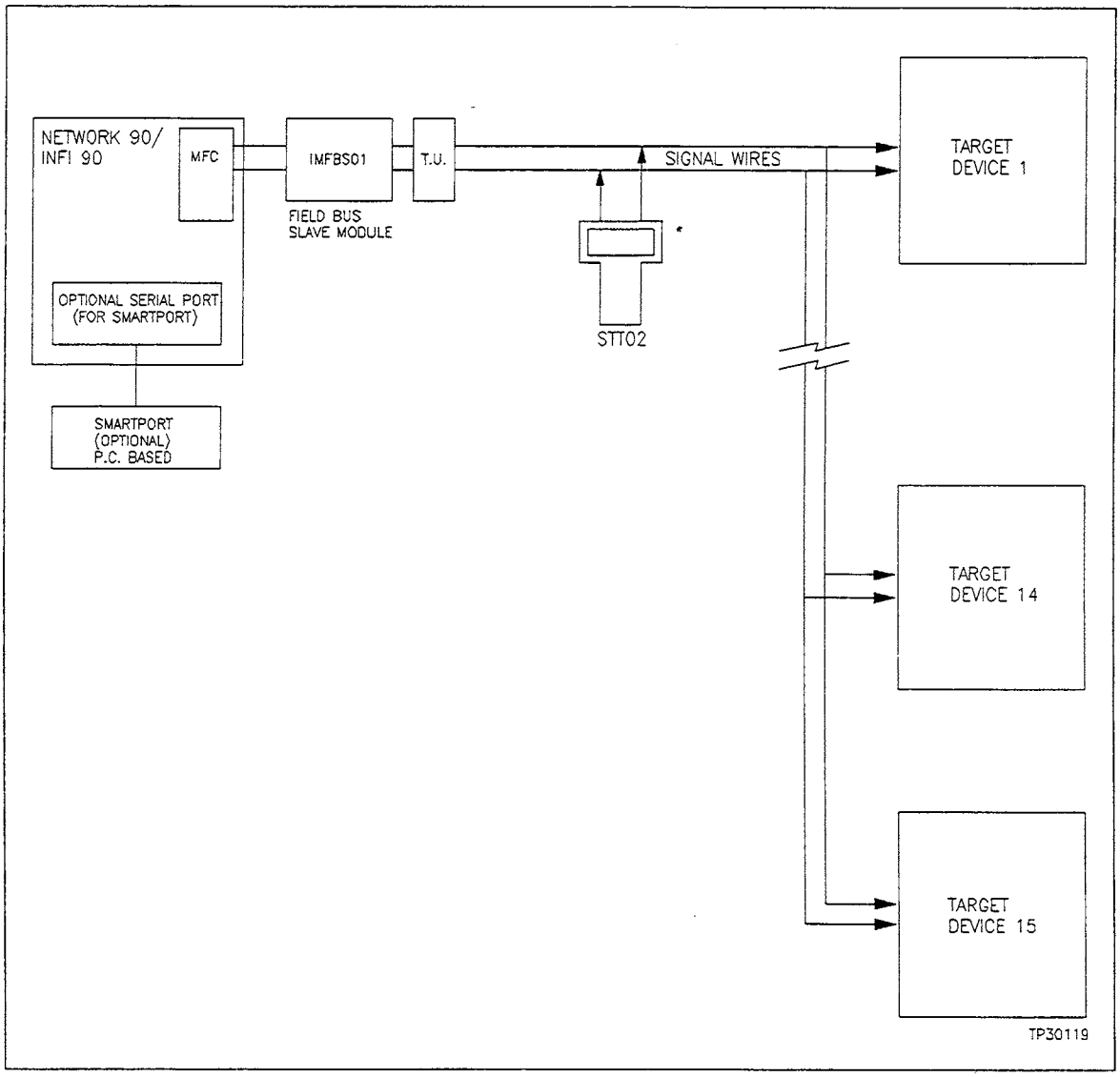


Figure 2-2. Field Bus Wiring

SECTION 3 — INSTALLATION

INTRODUCTION

This section provides unpacking and inspection information, and steps that make the STT02 operational.

UNPACKING and INSPECTION

Before unpacking, carefully examine exterior of the shipping container for evidence of in-transit damage. Inspect for punctures, tears or other damage which penetrates the outer container, and for evidence of water damage.

Examine the exterior of the Smart Transmitter Terminal for cracks, scratches, or any physical defects that may be present.

NOTE: Storage temperatures must not exceed the following limits: -4° to +158°F (-20° to +70°C).

If storing the STT02 prior to operation, pack in the original container, if possible. Store in an area free of extremes in temperature and humidity.

SETUP and PHYSICAL INSTALLATION

WARNING	**Non-rechargeable batteries may explode or leak if recharged. This unit contains six rechargeable batteries. If battery replacement is required replace all batteries at same time and only with rechargeable type. To prevent ignition of a hazardous atmosphere, batteries must only be charged or changed in an area known to be non-hazardous.**
AVERTISSEMENT	**Les piles non-rechargable peuvent exploser ou couler si rechargees. Cet ensemble comprend six piles rechargables. Si le remplacement dune pile est requis. Replacertoutes les piles en meme temps en utilisant des piles de type rechargeable seulement. Les piles ne doivent etre remplacees que dans un endroit ou le danger est manifestement inexistant.**

Charging STT02

For operation, it is necessary to charge the six AA batteries in the STT02 using Battery Charger, Bailey Part No. 1948580_1. A full charge takes approximately 48 hours.

Periodically the STT02 will require recharging. When fully charged, the unit can operate up to 24 hours continuously before recharging is required.

To charge the STT02 use the following procedure:

1. Insert male end of charger into the receptacle of STT02. The receptacle is located at the top of the STT02 near the display screen.

2. Plug charger into 120 V ac, 60 Hz outlet.

3. Allow STT02 to charge at least 1 hour before operating.

The STT02 can also be operated while being charged. To display the amount of charge on the STT02, turn the unit on and press the **F2** key. The percentage and the amount of hours of charge left on the batteries will be displayed. While the recharging process is taking place, the **F2** key is not accurate. To ensure accuracy of charge time, disconnect the charger while checking battery charge level.

SECTION 4 — OPERATING PROCEDURES

INTRODUCTION

In this section, the functions of the various keys on the STT02 will be discussed followed by step-by-step procedures for performing each of these functions. Throughout the step-by-step procedures, it will be necessary to refer to the appropriate **APPENDIX** for details relative to the applicable target device.

The Appendices include deviations from the procedures discussed in this section as well as screens and procedures for functions specific to the target device. Flowcharts located in the back of each Appendix, give the user an overall picture of the configuration and calibration procedures for each target device. A configuration worksheet is also provided for each target device. The worksheet not only saves the user time when entering a configuration into the STT02, but the completed worksheet also provides the user with a hard copy of the target device configuration.

NOTE: Be sure to make several copies of the blank worksheet to have on hand as needed.

OPERATOR/INTERFACE CONTROLS

Table 4-1 provides a description of the functions for the various keys on the STT02. The functions of the STT02 have been divided into the following three categories: Configuration, Calibration and the Operational category (refer to Table 4-2).

NOTES:

1. The **CONFIG**, **VIEW**, **SELECT DEVICE** and **F2** keys can function without a target device connected to the STT02. The other functions are **locked out** until a target device is connected to the terminal.

2. When a target device is not connected to the STT02 while performing calibration and operational functions, the following message will appear:

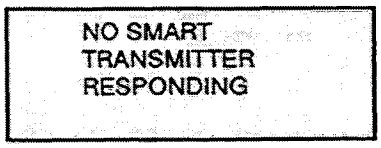


Table 4-1. STT02 Keypad Functions

KEY	FUNCTION
ON	Powers the unit and displays the Bailey name and STT02 software revision level, followed by a communication format selection menu.
OFF	Turns power off; stored configurations remain in internal memory. STT02 will shut itself off after fifteen minutes of idle operation.
↑ ↓ ← →	Used to scroll through menus, select functions, and select ASCII characters for data input. (Refer to Table 4-3 for the characters on the scroll.)
7 8 9 4 5 6 1 2 3 +/− 0 .	Includes the digits 0 through 9, a decimal point, and a sign key; used to input values into the terminal.
ENTER	Completes an input or a selection.
CONFIG	Used to: 1) input a new configuration into the STT02's internal memory, 2) modify an existing configuration, or 3) erase an existing configuration from the STT02's memory.
GET CONFIG	Retrieves, views and optionally saves (in STT02's internal memory) the configuration of the selected target device.
SEND CONFIG	Sends a user-selected configuration from the STT02 memory to the selected target device.
CALI-BRATE	Allows the user to step through various calibration procedures (dependent on the selected target device).
OUTPUT	Used to monitor target device's primary input or output, secondary output or selected transmitter's ambient temperature.
STATUS	Displays target device status based on results of continuous self diagnostics.
RE-RANGE	Used to change engineering units and set lower and upper range values of primary and secondary units of the target device and the output damping to suit specific applications.
SPECIAL FEATURE	Used to: 1) set output to a fixed value, 2) cancel a fixed output, or 3) LCD set up - select display units to be displayed on the target device's LCD.

Table 4-1. STT02 Keypad Functions (continued)

KEY	FUNCTION
CLEAR	Escapes the current function and returns the display to the READY condition..
SELECT DEVICE	Allows the user to select and change working configurations and change target devices (if connected).
VIEW	Steps through the selections of the working configuration.
F1	For future use.
F2	Displays the amount of charge left on the battery in percentage form, and displays the hours of operation time available before recharging (FSK mode only).

Table 4-2. STT02 Function Groupings

FUNCTION	PROCEDURE
CONFIGURATION	New Configuration Modify Configuration Erase Configuration Get Configuration Send Configuration View Configuration
CALIBRATION	D-to-A Adjustment Bench Calibration Rezero (BCN) Rerange
OPERATIONAL	Monitor Target Device Output (%) Monitor Target Device Input (Eng. Units) Fix Target Device Output Value Status Check

Table 4-3. STT02 Scroll Characters

A	G	M	S	Y	3	9
B	H	N	T	Z	4	%
C	I	O	U	-	5	/
D	J	P	V	0	6	#
E	K	Q	W	1	7	.
F	L	R	X	2	8	

NOTE: Holding the ↓ and ↑ cursor keys allows the user to quickly scroll through the available characters.

Initial Start-Up

The sequence of screens described will appear when STT02 is powered up for the first time and is not connected to a target device, or until a configuration is created and stored in the STT02.

NOTE: The STT02 will automatically shut itself off after approximately 15 minutes without operator interaction.

KEY	DISPLAY	COMMENTS
ON	BAILEY CONTROLS COMPANY REVISION X_X	
	COMMUNICATION FORMAT → FSK/BUS**STT02 BASEBAND*STT01	Choose *FSK* if using Bailey's line of new Smart Transmitters (BCN Pressure Transmitters and EQN Temperature Transmitters). **NOTE:** Refer to **APPENDIX C** through **I** for Baseband (STT01) operating procedures.
ENTER	SCANNING FOR SMART TRANSMITTERS	STT02 attempting to communicate with a target device.
	NO SMART TRANSMITTER RESPONDING	At this point, since no target device is present, the STT02 searches for a configuration in its internal memory.
	NO SMART TRANSMITTER CONFIGURATIONS PRESENT	Since this is initial start-up, no configurations will be found in memory.
	CHOOSE A TAG READY	The user can now create a configuration. Refer to **CONFIGURATION FUNCTIONS** for configuration procedures.

CONFIGURATION FUNCTIONS

NOTE: A series of X's may appear in the **DISPLAY** column of this instruction book where alphanumeric characters can be displayed or entered.

New and Modify Configuration Procedure

The NEW function allows the user to input and save a complete configuration. The MODIFY function allows the user to change an existing configuration.

NOTE: For illustrative purposes these procedures have been combined. Any deviation between them will be noted in the COMMENTS column.

A configuration can be created without the STT02 being connected to a target device. A number of configurations can be entered and stored in the STT02 to be sent to a transmitter at a later time with the **SEND CONFIG** key.

NOTE: The STT02 is assumed to be in the READY state when beginning the following procedures.

KEY	DISPLAY	COMMENTS
CONFIG	CONFIGURATION → NEW MODIFY ERASE	Select *NEW*. **NOTE:** To modify an existing configuration, select *MODIFY*. The screen sequence is the same, however, the MODIFY screens will appear with the values and cursor positions as they were originally configured.
ENTER	STT02 CONFIG. → [_]	The user enters a name for the configuration (also known as ID Tag) using up to 12 ASCII characters. To select a character, scroll through the available list (refer to Table 4-3) using the ↑ and ↓ cursor keys. Use the → cursor key to move to the next digit. To change a character, use the ← cursor key to backspace.
ENTER	SELECT MODE : → ANALOG DIGITAL	Select *DIGITAL* (device in this mode defaults to below 4 mA, independent of input). Use the the ↑ and ↓ cursor keys to select mode. **NOTE:** The *DIGITAL* selection should only be made when using an IMFBS01 Field Bus Slave Module.

KEY	DISPLAY	COMMENTS
↓	SELECT MODE : ANALOG → DIGITAL	If *ANALOG* is selected, *ENTER CHANNEL #* screen would not appear. The next screen would be *TRANSMITTER TYPE:.*
ENTER	ENTER CHANNEL #: _ XX	This screen is used to assign an address to the transmitter for use with the field bus. The address range is 1 through 15.
ENTER	TRANSMITTER TYPE → BCN EQN	Choose *BCN.* **NOTE:** At this point in the configuration procedure, there will be varying selection menus displayed, depending on the target device being configured. Refer to the applicable **APPENDIX** for details.
ENTER	OUTPUT TYPE : → LINEAR SQUARE ROOT 3/2 FLOW MODE	Move indicator to your choice with the cursor keys. (Refer to the applicable Product Instruction for an explanation of the output types.) **NOTE**: The STT02 screen is capable of displaying three output types on the menu. Use ↑ and ↓ cursor keys to view additional output types.
↓	OUTPUT TYPE : LINEAR → SQUARE ROOT 3/2 FLOW MODE	If *FUNC GENERATOR* is chosen as an output, five input and output points need to be entered as a percentage of input. The first and last points on the curve are assumed to be 0.00% and 100.00%, the five points to be specified are to be between these two values.
↓	OUTPUT TYPE : LINEAR SQUARE ROOT → 3/2 FLOW MODE	
↓	OUTPUT TYPE : SQUARE ROOT 3/2 FLOW MODE → 5/2 FLOW MODE	
↓	OUTPUT TYPE : 3/2 FLOW MODE 5/2 FLOW MODE → FUNC GENERATOR	

KEY	DISPLAY	COMMENTS
ENTER	POINT 1 INP(%) XX.XX POINT 1 OUT(%) XX.XX	Use the number keys to enter a value from 0.00 to 99.99 for the INP(%).
ENTER	POINT 5 INP(%) XX.XX POINT 5 OUT XX.XX	Press **ENTER**. Use the number keys to enter a value from 0.00 to 99.99 for the OUT(%) value. Press **ENTER**. Continue until all five pairs of points have been entered.
ENTER	OUTPUT ACTION: → NORMAL REVERSE	Move the indicator to your selection. (Refer to the applicable Product Instruction for an explanation of terms.)
ENTER	DAMPING : 0-32 SEC) XX.XX SEC	Enter a value from 0.00 to 32.00 seconds.
ENTER	ENGINEERING UNIT → iH2O mmHG cmH2O PSI MPA KPA BARS mBAR Kgcm2	**NOTE:** The configuration procedure selection menu will vary depending on the type of transmitter selected. For this example *BCN* was chosen, therefore BCN units menu is displayed.
ENTER	LOWER RANGE VAL. X.XX iH20 UPPER RANGE VAL. X.XX iH20	Input lower range value using the cursor keys, then press **ENTER**. Input the upper range value, then press **ENTER**. The displayed units are those the user selected in the previous step.
ENTER	INITIALIZE MODE: → LOW HIGH	Make selection using cursor keys. Refer to applicable Product Instruction for mode description.
ENTER	FAIL MODE : → LOW HIGH LAST	Make selection using cursor keys.

KEY	DISPLAY	COMMENTS
ENTER	ENTER SECONDARY UNITS _XXXXXX	This is a six character alphanumeric designation to represent values that are user-familiar. Use the ↑ and ↓ arrow keys to scroll through the alphanumeric list. Use ← and → arrow keys to move to the next character place.
ENTER	SECONDARY L.R. XX.XX UNITS SECONDARY U.R. XX.XX UNITS	Make selection using number keys. The *UNITS* displayed will be those designated in the previous screen. Once the lower range value is entered, press **ENTER** to input the upper range value.
ENTER	STORE THIS CONFIGURATION? → NO YES	Make selection using cursor keys.
↓	STORE THIS CONFIGURATION? NO → YES	
ENTER	CONFIG. ID TAG READY	Configuration ID Tag name just configured will be displayed in upper left hand corner if the configuration was saved. It becomes the working configuration.

NOTE: Simply going to **CONFIG** and selecting *MODIFY* will not allow the user to scroll through the configurations stored in the STT02. By doing this, the user can only modify the working configuration.

CHANGING WORKING CONFIGURATIONS (Connected Target Device)

The working configuration is the configuration that the STT02 operates with. MODIFY (found under **CONFIG**) only affects the working configuration. To change working configurations, refer to the following example:

KEY	DISPLAY	COMMENTS
	CONFIG-1 READY	Present working configuration name is displayed above *READY.*
SELECT DEVICE	SCANNING FOR SMART TRANSMITTERS	
	SELECT XMITTER : → [CONFIG-1]	Presently the user is communicating with a transmitter that is named CONFIG-1. To access configurations that are stored in the STT02, press **CLEAR**.
CLEAR	STT02 CONFIG. → [CONFIG-1] CONFIG-2	The STT02 displays the names of its stored configurations. For this example, select *CONFIG-2*.
↓	STT02 CONFIG. → [CONFIG-2]	Two configurations appear in this STT02 example. However, as many as 75 can reside in STT02.
ENTER	CONFIG-2 READY	The user has now changed Working Configurations. The operation keys selected now will operate on CONFIG-2.

CHANGING WORKING CONFIGURATIONS (No Target Device)

There is a variance in procedure due to the absence of a target device.

KEY	DISPLAY	COMMENTS
	CONFIG-1 READY	Working configuration is CONFIG-1.
SELECT DEVICE	SCANNING FOR SMART TRANSMITTERS	
	NO SMART TRANSMITTER RESPONDING	Since no target device is present this message appears.
	STT02 CONFIG → [CONFIG-1] CONFIG-2	User now accesses configurations stored in the STT02.
↓	STT02 CONFIG. → [CONFIG-2]	
ENTER	CONFIG-2 READY	The user has now changed working configurations. The function keys selected now will affect CONFIG-2.

Erase Configuration Procedure

This procedure allows the user to erase a selected configuration from STT02 memory.

KEY	DISPLAY	COMMENTS
CONFIG	CONFIGURATION → NEW MODIFY ERASE	Select *ERASE*.
↓	CONFIGURATION NEW → MODIFY ERASE	
↓	CONFIGURATION NEW MODIFY → ERASE	
ENTER	STT02 CONFIG. → [CONFIG. ID TAG]	Make selection by scrolling through the displayed ID Tags using the cursor keys. When the indicator arrow points to desired choice, press **ENTER**. **NOTE:** To return to the READY display without erasing a configuration press **CLEAR** before pressing **ENTER**.
ENTER	CONFIG. ID TAG READY	Configuration has been erased from internal memory.

NOTE: There is a procedure by which the user can reset and completely erase all configurations stored in the internal memory of the STT02. The user may want to do this when the unit is first received, before entering new configurations into the unit. However, once the memory is reset, erased configurations cannot be recalled.

To completely erase the STT02 internal memory of stored configurations, hold the +/- and **ENTER** keys down, simultaneously, and turn the STT02 **ON**. The Bailey Logo and STT02 software revision level will be displayed for a few seconds followed by the *READY* prompt. **ALL CONFIGURATIONS STORED IN THE INTERNAL MEMORY HAVE BEEN ERASED.**

Get Configuration Procedure

This key allows the user to view and/or save the configuration of a connected target device.

NOTE: To utilize the **GET CONFIG** function, the STT02 must be connected to a target device.

KEY	DISPLAY	COMMENTS
GET CONFIG	SELECTED CONFIGURATION [XXXXXXXXXXX]	The name within the brackets is the working configuration.
ENTER	STORE THIS CONFIGURATION ? → NO YES	Offers the user the option of saving the configuration in the STT02 internal memory for future use.
↓	STORE THIS CONFIGURATION ? NO → YES	Once the configuration is stored, the user can abort GET CONFIG., by pressing **CLEAR**, without losing the configuration from memory. **NOTE**: A maximum of 75 configurations can be stored in STT02 memory.
ENTER	CONFIG ID TAG NAME TYPE : BCN MODE : DIGITAL CHANNEL : XX	The 12 character ID Tag of the connected target device's configuration is displayed. If configured for ANALOG, the CHANNEL line of the screen will not be present.
ENTER	OUTPUT TYPE: LINEAR → SQUARE ROOT 3/2 FLOW MODE	
ENTER	OUTPUT ACTION: → NORMAL REVERSE	Arrow points to the configured output action. (Refer to the applicable Product Instruction for an explanation of terms.)
ENTER	DAMPING (0-32 SEC) _X.XX SEC	Damping value is displayed to the nearest hundredth of a second.

KEY	DISPLAY	COMMENTS
ENTER	LOWER RANGE VAL. X.XX UNIT UPPER RANGE VAL. X.XX UNIT	Lower and upper range values are displayed in the configured units.
ENTER	INITIALIZE MODE: → LOW HIGH	Indicator points to the configured mode.
ENTER	FAIL MODE: → LOW HIGH LAST	Indicator points to the configured mode.
ENTER	SECONDARY L.R. XX.XX UNITS SECONDARY U.R. XX.XX UNITS	Secondary lower range and upper range are displayed to the nearest hundredth.
ENTER	CONFIG. ID TAG READY	

Send Configuration Procedure

This procedure allows the user to select a configuration from the STT02's memory and send it to a connected target device.

KEY	DISPLAY	COMMENTS
SEND CONFIG	STT02 CONFIG. → [ID TAG NAME]	If other configurations exist in STT02 memory, they will be displayed below the ID tag within the brackets. To select another configuration, use the ↑ and ↓ cursor keys to scroll through list.
ENTER	SCANNING FOR SMART TRANSMITTERS	
	SEND CONFIG TO : → [ID OF TRANSMITTER]	Use the ↑ and ↓ cursor keys to choose device. **NOTE**: The field bus can support up to 15 devices.
ENTER	SENDING CONFIGURATION	
	CONFIG. ID TAG READY	Configuration has been sent.

View Configuration Procedure

This procedure allows the user to view the working configuration.

KEY	DISPLAY	COMMENTS
VIEW	CONFIG. ID TAG TYPE : BCN MODE : DIGITAL CHANNEL : 1	**NOTE**: Modifications cannot be made to the configuration during the VIEW procedure.
ENTER	OUTPUT TYPE : → LINEAR SQUARE ROOT 3/2 FLOW MODE	
ENTER	OUTPUT ACTION: → NORMAL REVERSE	
ENTER	DAMPING (0-32 SEC) _0.00 SEC	Damping is displayed to the nearest hundredth of a second.
ENTER	LOWER RANGE VAL. 0.00 UNITS UPPER RANGE VAL. 0.00 UNITS	Lower and upper range values of the target device are displayed in the configured engineering units.
ENTER	INITIALIZE MODE: → LOW HIGH	Arrow indicates mode.
ENTER	FAIL MODE: → LOW HIGH LAST	Arrow indicates mode.
ENTER	CONFIG. ID TAG READY	

CALIBRATION FUNCTIONS

NOTES:
1. The Bench Calibration and Rezero procedures are located in the Appendix for the target device(s) for which they are applicable.

2. A series of X's in the display portion of the function procedures indicates that an alphanumeric character can be displayed or input in that position.

Bench Calibration

Selected under the **CALIBRATE** key, the user enters lower and upper pressure values and then applies those pressure values along with a middle range pressure value calculated by the STT02.

NOTE: The following procedures are done on a BCN and configured in the analog mode.

KEY	DISPLAY	COMMENTS
CALI-BRATE	OUTPUT WILL BE AFFECTED!	
	PROCEED ? → NO YES	
↓	PROCEED ? NO → YES	
ENTER	CALIBRATION : → D-TO-A ADJUST BENCH CALIB. REZERO	To see the calibration screen as it would appear if the device were configured for the DIGITAL mode, refer to **APPENDIX A**.
ENTER	ENTER XMITTER AMBIENT TEMP. XX.XX C	Enter transmitter ambient temperature.

KEY	DISPLAY	COMMENTS
ENTER	ENTER COMP. DATA? → NO YES	*COMP. DATA* pertains to the BCN Pressure Transmitter. Refer to **APPENDIX A** for explanation and for additional screens associated with this function.
ENTER	LOW CALIB. PRES. 0.00 iH20 HIGH CALIB PRES. 200.00 iH20	The values shown are for illustrative purposes. The user enters the *LOW CALIB. PRES.* and presses **ENTER**. Then enters *HIGH CALIB PRES.*
ENTER	APPLY PRESSURE OF 0.00 iH20 THEN HIT ENTER	The user applies the low calibration pressure to the transmitter as specified in the previous step.
ENTER	APPLY PRESSURE OF 200.00 iH20 THEN HIT ENTER	The user applies the high calibration pressure to the the transmitter as specified earlier.
ENTER	APPLY PRESSURE OF 100.00 iH20 THEN HIT ENTER	**NOTES:** 1. The user applies the middle calibration pressure. STT02 calculates this value based upon the high and low values. 2. If applied pressure is not accurate to within ± 0.5 %, a diagnostic message will appear: *TRANSMITTER INPUT APPLIED INCORRECTLY*. Re-calibrate transmitter.
ENTER	CALIB. ID TAG READY	

Rerange Procedure

The following procedure allows the user to set the lower and upper ranges and/or change the engineering units of the target device to suit a particular application. The ranges must be within those specified for the device.

NOTE: Target Device output is based on the values entered in this procedure. The terminal will not reject invalid ranges; therefore, it is imperative that the user know the range limits specified for the device being used. (Refer to applicable Product Instruction for specified range spans.)

KEY	DISPLAY	COMMENTS
RE-RANGE	OUTPUT WILL BE AFFECTED!	This operation will cause a change in output not corresponding to the input. Be sure the control loop is in manual.
	PROCEED ? → NO YES	To select *NO* press **ENTER**. Display will return to the READY condition. Select *YES* using the ↓ cursor key.
↓	PROCEED ? NO → YES	
ENTER	ENGINEERING UNIT → iH2O mmHg cmH2O PSI MPA KPA BARS mBARS Kgcm2	
ENTER	LOWER RANGE VAL. XX.XX UNITS UPPER RANGE VAL. XX.XX UNITS	Input desired value using the numbered keypad. Press **ENTER**. Repeat for upper range value. **NOTE:** Engineering units displayed will be those selected during configuration or calibration.
ENTER	SECONDARY L.R. XX.XX UNITS SECONDARY U.R. XX.XX UNITS	

KEY	DISPLAY	COMMENTS
ENTER	DAMPING : (0-32 SEC) 0.00 SECS	
ENTER	CONFIG. ID TAG READY	

NOTE: RERANGE will update the target device configuration, not the STT02 internal configuration. To update the internal STT02 configuration: perform GET CONFIG and save it in the STT02.

OPERATIONAL FUNCTIONS

NOTE: A series of X's in the display portion of the function procedures indicates that an alphanumeric character can be displayed or entered in that position.

Special Feature Key

The **SPECIAL FEATURE** key allows the user to fix the output of a target device to a set value and cancel that value. Another option lets the user select the display units of the transmitter output.

FIX OUTPUT PROCEDURE

User is able to set the output to a percentage of output, where the output of the transmitter would not change until FIX OUTPUT is canceled.

KEY	DISPLAY	COMMENTS
SPECIAL FEATURE	→ FIX OUTPUT LCD SETUP CANCEL FIX OUT.	
ENTER	FIX OUTPUT TO : XX.XX %	User can set the output to a fixed value.
ENTER	CONFIG. ID TAG READY	Output remains at a fixed value until *CANCEL FIX OUT* is selected.

CANCEL FIX OUTPUT PROCEDURE

By selecting *CANCEL FIX OUT* the transmitter output is no longer set at the fix value.

KEY	DISPLAY	COMMENTS
SPECIAL FEATURE	→ FIX OUTPUT LCD SETUP CANCEL FIX OUT.	Use the cursor keys to select *CANCEL FIX OUT*.
↓	FIX OUTPUT → LCD SETUP CANCEL FIX OUT.	
↓	FIX OUTPUT LCD SETUP → CANCEL FIX OUT.	
ENTER	CONFIG. ID TAG READY	

LCD SETUP PROCEDURE

This function allows the user to choose display units. The user can display the output in secondary units, primary units and % output.

KEY	DISPLAY	COMMENTS
SPECIAL FEATURE	→ FIX OUTPUT LCD SETUP CANCEL FIX OUT.	
↓	FIX OUTPUT → LCD SETUP CANCEL FIX OUT.	
ENTER	LCD DISPLAY UNIT → SECONDARY E.U. PRIMARY E.U. % OUTPUT	The transmitter's LCD will display secondary units as specified in configuration.
CLEAR	CONFIG. ID TAG READY	

Monitor Target Device Input Procedure

This function allows the user to continuously monitor the input to the target device. The input is displayed in engineering units.

KEY	DISPLAY	COMMENTS
OUTPUT	→ MONITOR OUTPUT MONITOR INPUT SECONDARY UNITS TEMPERATURE	Select *MONITOR INPUT* using the ↓ key.
↓	MONITOR OUTPUT → MONITOR INPUT SECONDARY UNITS TEMPERATURE	
ENTER	CONFIG. ID TAG PRIMARY INPUT : XXX.XX UNITS GOOD QUALITY	Input is displayed in the primary engineering units. The display is updated every second. The input is continuously monitored until the user presses the **CLEAR** key.
CLEAR	CONFIG. ID TAG READY	

Monitor Target Device Output Procedure

This function allows the user to continuously monitor the output of the target device as a percent of the input.

KEY	DISPLAY	COMMENTS
OUTPUT	→ MONITOR OUTPUT MONITOR INPUT SECONDARY UNITS TEMPERATURE	Select to monitor the target device output by pressing **ENTER**.
ENTER	CONFIG. ID TAG PRIMARY OUTPUT : XXX.XX %	The output is displayed as percent of calculated output. The display is updated every second. The output is monitored continuously until the user presses the **CLEAR** key.
CLEAR	CONFIG. ID TAG READY	

Monitor Secondary Units Output Procedure

With this function, the user is able to display the output of the target device in user defined units which were specified in configuration.

KEY	DISPLAY	COMMENTS
OUTPUT	→ MONITOR OUTPUT MONITOR INPUT SECONDARY OUTPUT TEMPERATURE	
↓	MONITOR OUTPUT → MONITOR INPUT SECONDARY UNITS TEMPERATURE	
↓	MONITOR OUT MONITOR IN → SECONDARY UNITS TEMPERATURE	Secondary Units can be up to six user defined characters.
ENTER	SECONDARY UNITS XXX.XXX UNITS	
CLEAR	CONFIG. ID TAG READY	

Temperature Function Procedure

By using this function the user is able to display the ambient temperature of the transducer or reference junction temperature in degrees Celsius.

KEY	DISPLAY	COMMENTS
OUTPUT	→ MONITOR OUTPUT MONITOR INPUT SECONDARY OUTPUT TEMPERATURE	
↓	MONITOR OUTPUT → MONITOR INPUT SECONDARY UNITS TEMPERATURE	
↓	MONITOR OUTPUT MONITOR INPUT → SECONDARY UNITS TEMPERATURE	
↓	MONITOR OUTPUT MONITOR INPUT SECONDARY UNITS → TEMPERATURE	
ENTER	CONFIG. ID TAG TEMPERATURE: XXX.XX C	Displays the temperature of transducer or reference temperature in degrees Celsius.
CLEAR	CONFIG. ID TAG READY	

Status Check Procedure

The following is a procedure for checking the status of the target device based on the results of the continual self diagnostics. The self tests include monitoring of such components and variables as the transducer, transducer temperature, transmitter ambient temperature, input circuits, processor EEPROM, non-volatile memory, and reference voltages.

NOTE: When **STATUS** key is pressed the problem holding the highest priority (based on a priority structure) would be displayed. Any other problem that may exist cannot be viewed until the problem with the highest priority is corrected.

KEY	DISPLAY	COMMENTS
STATUS	TRANSMITTER O.K.	The TAG ID of the connected Target Device is displayed. Test results successful no problems to report. If, instead, the target device has diagnosed a problem in any of the areas mentioned above, refer to the **TROUBLESHOOTING** section of this product instruction and/or the applicable product instruction.

SECTION 5 — TROUBLESHOOTING

INTRODUCTION

This section gives the user a list of error messages that can appear on the LCD screen of the STT02. These messages and PROBABLE CAUSES associated with them, pertain to the STT02.

ERROR MESSAGES AND CORRECTIVE ACTION

Table 5-1. Error Messages

MESSAGE	PROBABLE CAUSE	CORRECTIVE ACTION
READY B	a. Charge on batteries is low.	Recharge batteries. Refer to **Charging STT02** in the **INSTALLATION** section. **NOTE:** If, after charging of the batteries, the **B** remains; refer to b.
	b. Battery failure.	Replace batteries. Refer to **Replacing Rechargeable Batteries** in the **REPAIR/REPLACEMENT** section.
	c. Battery charger failure.	Replace battery charger. Refer to **RECOMMENDED SPARE PARTS FOR STT02** for part and kit numbers.
STT02 INTERNAL BATRAM FAILURE	Defective BATRAM.	Replace BATRAM. Refer to **Replacing Batram** in the **REPAIR/REPLACEMENT** section.
TRANSMITTER CONFIGURATION DOES NOT MATCH BATRAM'S	a. If RERANGE was performed and configuration changes are intended to be permanent, refer to associated **CORRECTIVE ACTION** pertaining to this error.	Press GET CONFIG and save the configuration.
	b. If RERANGE was performed and changes are not permanent; ignore this error message.	
	c. Transmitter contains default configuration.	Perform SEND CONFIG using the desired configuration. Refer to **Send Configuration Procedure** in **OPERATING PROCEDURES** for details.

MESSAGE	PROBABLE CAUSE	CORRECTIVE ACTION
TRANSMITTER NOT RESPONDING	a. STT02 not connected properly.	Check STT02 wiring connections. See Figure 2-1 or Figure 2-2 for correct wiring arrangements.
	b. Short in communication wire.	Perform continuity check to determine if a short exists.
	c. Problem pertains to target device.	Refer to appropriate target device product instruction for corrective action.

SECTION 6 — REPAIR/REPLACEMENT

INTRODUCTION

This section provides the user with special handling procedures for MOS devices, and disassembly procedures for various components of the STT02. Also included, is a list of kits available for replaceable components.

SPECIAL HANDLING PROCEDURES FOR MOS DEVICES

Metal Oxide Semiconductor (MOS) devices are subject to damage by static electricity. Therefore, the following techniques should be observed during servicing, troubleshooting, and repair.

1. Most assemblies with MOS devices are shipped in a special anti-static bag. Keep the assembly in the bag as much as possible whenever the assembly is not in the system.

2. Assemblies containing MOS devices should be removed from their anti-static protective container only under the following conditions:

   a. When at a designated static-free workstation or when the bag is grounded at the field site.

   b. Only after the conductive area of container has been neutralized.

   c. Only after firm contact with an anti-static mat and/or firmly gripped by a grounded individual.

3. Personnel handling assemblies with MOS devices should be neutralized to a static-free workstation by a grounding wrist strap that is connected to the station or to a good ground point at the field site.

4. Do not allow clothing to make contact with MOS devices. Most clothing generates static electricity.

5. Avoid touching edge connectors and components.

6. Avoid partial connection of MOS devices. Most devices can be damaged by floating leads, especially the power supply connector. If an assembly must be inserted into a live system, it should be done quickly. Do not cut leads or lift circuit paths when troubleshooting.

7. Ground Test Equipment.

8. Avoid static charges during repair. Make sure circuit board is thoroughly clean around its leads but do not rub or clean with an insulating cloth.

NOTE: An anti-static kit (ESD Field Service Kit, Bailey Part No. 1948385-1) is available for personnel working on devices containing MOS components. The kit contains a static-dissipative work surface (mat), a ground cord assembly, wrist bands and alligator clip.

DISASSEMBLY OF STT02 CASE ASSEMBLY

This set of instruction should be completed before performing the other procedures listed in this section.

1. Turn power off by pressing the **OFF** key on the keypad.

2. Place the STT02 on a table or smooth surface with the keypad down.

3. Remove the four (4) screws from the lower case of the STT02.

4. Carefully lift the lower case off the PC board.

5. Grasp the PC board by the edges and turn it over so the components on the board are facing up (see Figure 6-1).

6. Carefully disconnect the keypad connector strip from the PC board. This will allow the PC board to lie flat next to the upper case assembly.

REPLACING STT02 EPROM

The EPROM stores the operating software of the STT02 (EPROM shown in Figure 6-1). When needed, software revisions are made and issued to customers by Bailey. The following procedure is provided to assist the user in replacement of the EPROM.

1. Complete **Disassembly of STT02 Case Assembly**.

2. Using an Integrated Circuit (IC) removal tool, carefully remove the EPROM (see Figure 6-1 for EPROM location).

3. Follow the precautions in **Special Handling Procedures For MOS Devices** when handling the EPROM. Insert the new EPROM, Part No. 1900185_1□ using the following procedure:

   a. Grasp the EPROM at the edges that have no connecting pins (right-side and notched-side, Figure 6-1).

b. Observe the position of the notched-side of the EPROM in Figure 6-1. Without fully inserting the connecting pins, set the EPROM in the connecting socket.

c. Make sure the connecting pins of the EPROM are properly seated in the socket.

d. Place two fingers on the EPROM and evenly apply pressure. The EPROM should snap into place.

4. Refer to **Reassembling The STT02 Case Assembly**, located in this section, to complete this procedure.

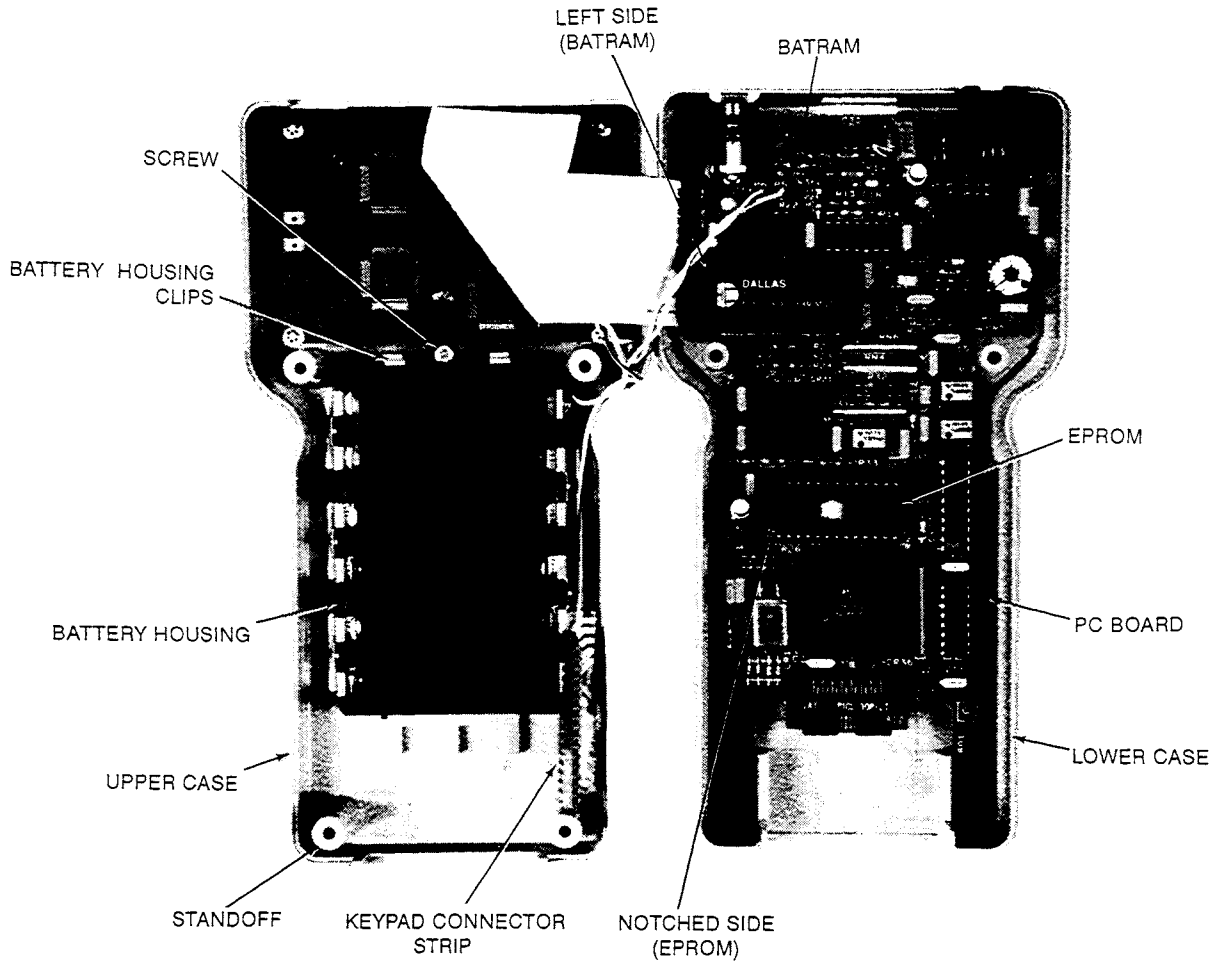


Figure 6-1. STT02 Internal Component Locations

REPLACING BATRAM

BATRAM is where configurations are stored within the STT02. If replacement is necessary, use the following procedure:

1. Complete **Disassembly of STT02 Case Assembly.**

2. Using an Integrated Circuit (IC) removal tool, carefully remove the BATRAM (see Figure 6-1 for BATRAM location).

3. Follow the precautions in **Special Handling Procedures For MOS Devices** when handling the BATRAM. Insert the new BATRAM, Part No. 1948147_1 using the following procedure:

   a. Grasp the BATRAM at the edges that have no connecting pins (right-side and left-side, Figure 6-1).

   b. Observe the position of the BATRAM in Figure 6-1. (The print on the replacement BATRAM should be legible for correct assembly.) Without completely inserting the connecting pins, set the BATRAM in its socket.

   c. Make sure the connecting pins are properly seated in the socket.

   d. Place two fingers on the BATRAM and evenly apply pressure. The BATRAM should snap into place.

4. Refer to **Reassembling The STT02 Case Assembly**, located in this section, to complete this procedure.

REPLACING RECHARGEABLE BATTERIES

If at some point the user replaces the AA rechargeable NiCd batteries, they can usually be purchased anywhere batteries are sold.

Remove the battery housing using the following procedure (see Figure 6-1):

1. Complete **Disassembly of STT02 Case Assembly.**

2. Remove screw securing battery housing (Figure 6-1).

3. Place thumbs on the battery housing clips. Push the clips away from the battery housing. The battery housing will be released and will rest on the clips.

4. Remove the battery housing, being careful not twist or damage the wires. Place the housing so the batteries are accessible.

5. Remove the batteries from the housing.

WARNING	**Non-rechargeable batteries may explode or leak if recharged. This unit contains six rechargeable batteries. If battery replacement is required replace all batteries at same time and only with rechargeable type. To prevent ignition of a hazardous atmosphere, batteries must only be changed in an area known to be non-hazardous.**
AVERTISSEMENT	**Les piles non-rechargeable peuvent exploser ou couler si rechargees. Cet ensemble comprend six piles rechargables. Si le remplacement dune pile est requis. Replacertoutes les piles en meme temps en utilisant des piles de type rechargeable seulement. Les piles ne doivent etre remplacees que dans un endroit ou le danger est manifestement inexistant.**

6. Insert the replacement, AA rechargeable batteries, according to the diagram shown on the battery housing.

7. Turn the battery housing over (batteries facing down), and reinsert housing as shown in Figure 6-1.

8. Replace screw securing battery housing.

9. Refer to **Reassembling The STT02 Case Assembly**, located in this section, to complete this procedure.

REASSEMBLING THE STT02 CASE ASSEMBLY

1. Reconnect the keypad connector strip.

2. Turn the PC board over, setting and aligning the board with the stand-offs located on the upper case.

3. Place the lower case on the unit, carefully aligning the communication cord receptacle.

NOTE: Be sure that wires do not protrude from case assembly.

4. Press cases together until properly seated, maintain pressure on the cases.

5. Insert the four (4) screws into the back of the lower case and tighten until heads are flush with case.

RECOMMENDED SPARE PARTS FOR STT02

NAME	PART NO.	DESCRIPTION
KIT NO. 258474_1 BATRAM	1948147_1	BATRAM, internal configuration memory.
KIT NO. 258445_1 COMMUNICATION CABLE (BASEBAND)	1948517_2	STT02 Communication Cable. (baseband)
COMMUNICATION CABLE (FSK)	1948517_3	STT02 Communication Cable (FSK).
KIT NO. 258471_1 EPROM	1900185_1☐	STT02 EPROM.
MEMORY CARTRIDGE	6637531_1	Cartridge, expands configuration memory.
RECHARGER	*1948580_1	Battery Charger, Input: 110 V, 50-60Hz. Output: 9 V, 100 mA.
	* For non - U.S standard applications, use a charger which will produce 9 V, 100 mA, similar to: LCR Electronics Inc. Part No. AD0910B2-PN4 (220 V).	

APPENDIX A — TYPE BCN SMART ELECTRONIC PRESSURE TRANSMITTERS

INTRODUCTION

The STT02 Smart Transmitter Terminal allows the user to remotely calibrate, configure, troubleshoot, and monitor the Smart BCN Pressure Transmitter. This Appendix provides deviations from the step-by-step procedures, relative to the BCN Transmitter. The **D-to-A Adjustment, Bench Calibration,** and **Rezero** procedures, relative to the Smart BCN Transmitter, are also included in this Appendix.

Refer to Figure A-1 for a configuration procedure flow chart. Refer to Figure A-2 for a flow chart of the calibration procedure. (Note that the rerange procedure is included in the bench calibration procedure.)

When the STT02 is turned **ON**, the Bailey logo and STT02 Software Revision Level will be displayed, followed by a communication format menu:

```
COMMUNICATION
     FORMAT
→ FSK/BUS**STT02
  BASEBAND*STT01
```

NOTES:

1. The following procedures in this appendix are all performed in the FSK/BUS**STT02 communication format. For operation in the BASEBAND*STT01 format, refer to **APPENDIX C** through **H** for information and procedures.

2. For configuration procedures for the BCN, refer to **Configuration Functions** in the **OPERATING PROCEDURES** section. Located in the back of this manual are configuration worksheets for each device. If filled out, they provide the user with a hard copy of the configuration. Make several copies of the applicable worksheet for future use.

The user will select a transmitter. When configuring, a transmitter does not have to be connected to the terminal. When calibrating, a transmitter must be connected to the STT02. When using a IMFBS01 Module (Field Bus) the user can have up to 15 transmitters on the bus, in which case the user would select the transmitter using the **SELECT DEVICE** key.

```
SELECT XMITTER :
→ [XXXXXXXXXXX]
```

Once the device has been selected the READY screen will be displayed. The configuration ID tag the transmitter has been configured with will be displayed in the upper left hand corner.

```
CONFIG. ID TAG
     READY
```

CALIBRATION PROCEDURES

D-TO-A Adjust Procedure

The D-TO-A ADJUST selection is only present when the user is configured to be in the ANALOG communication mode, declared in the CONFIGURATION procedure. This selection allows the user to adjust the 4 to 20 mA output of the target device.

KEY	DISPLAY	COMMENTS
CALI-BRATE	OUTPUT WILL BE AFFECTED!	
	PROCEED ? → NO YES	
↓	PROCEED ? NO → YES	
ENTER	CALIBRATION → D-TO-A ADJUST BENCH CALIB. REZERO	

KEY	DISPLAY	COMMENTS
ENTER	ADJUST TO 4mA THEN HIT ENTER	Use the ↑ and ↓ keys to adjust the 4 to 20mA signal. **NOTE:** When increasing or decreasing the mA signal, the increments of change increase with successive depressions until the maximum level of change is reached. By changing direction the user will return to the smallest increment of change. This technique speeds up the adjustment process without affecting fine adjustment.
ENTER	ADJUST TO 20mA THEN HIT ENTER	Use the ↑ and ↓ keys to adjust the signal.
ENTER	CONFIG. ID TAG READY	

Bench Calibration Procedure

This procedure applies to BCN Transmitters configured for either ANALOG or DIGITAL; any difference between the two are noted in the COMMENTS column.

KEY	DISPLAY	COMMENTS
CALI-BRATE	OUTPUT WILL BE AFFECTED!	
	PROCEED ? → NO YES	
↓	PROCEED ? NO → YES	

KEY	DISPLAY	COMMENTS
ENTER	CALIBRATION: → D-TO-A ADJUST BENCH CALIB. REZERO	Select *BENCH CALIB.*
↓	CALIBRATION: D-TO-A ADJUST → BENCH CALIB. REZERO	If configured digitally, the *D-TO-A ADJUST* selection would not appear.
ENTER	ENTER XMITTER AMBIENT TEMP. XX.XX C	Enter the transmitter's ambient temperature in degrees Celsius using the number keypad. The surrounding room temperature can be used for this temperature value.
ENTER	ENTER COMP DATA? → NO YES	
↓	ENTER COMP DATA NO → YES	This data is based on characteristics of individual transducers for temperature correction. Refer to applicable Product Instruction.
ENTER	ZERO SHIFT A. 000000000 B. 000000000 C. 000000000 D. 000000000 E. 000000000	There are five sets of data, A through E, press **ENTER** to advance to the next set of data. This data should match the tag located in the electronics side of the transmitter.
ENTER	SPAN SHIFT A. 000000000 B. 000000000 C. 000000000 D. 000000000 E. 000000000	There are also five sets of data, A through E, for span shift. Press **ENTER** to advance to the next set of data.
ENTER	ENTER CHECKSUM _ XX	This number is located within the electronics housing, along with Zero and Span Shift data. Checksum purpose is to ensure that the Zero and Span Shift data is entered correctly.

KEY	DISPLAY	COMMENTS
CALI–BRATE	LOW CALIB. PRES. XXX.XX UNITS HIGH CALIB PRES. XXX.XX UNITS	Enter desired lower range value using the number keys. Press **ENTER**. Input upper range value in the same way. **NOTE:** The pressure units shown are those that were selected during the configuration procedure.
ENTER	APPLY PRESSURE OF XX.XX UNITS THEN HIT ENTER	Apply low range value to the input of transmitter as was specified in the previous step.
ENTER	APPLY PRESSURE OF XX.XX UNITS THEN HIT ENTER	Apply high range value to the input of transmitter as specified earlier.
ENTER	APPLY PRESSURE OF XX.XX THEN HIT ENTER	Apply middle range value. This value is calculated by STT02 using low and high values.
ENTER	ADJUST TO 4 mA THEN HIT ENTER	If configured digitally this adjust selection would not appear. Adjust transmitter output using ↑ and ↓ cursor keys. **NOTE:** When increasing or decreasing the mA signal, the increments of change increase with successive depressions until the maximum level of change is reached. By changing direction the user will return to the smallest increment of change. This technique speeds up the adjustment process without affecting fine adjustment.
ENTER	ADJUST TO 20 mA THEN HIT ENTER	Adjust transmitter output using ↑ and ↓ cursor keys.
ENTER	CONFIG. ID TAG READY	Bench calibration is complete.

Rezero procedure

The **Rezero** procedure allows the user to zero the transmitter without going through the complete **Bench Calibration** Procedure.

KEY	DISPLAY	COMMENTS
CALI-BRATE	OUTPUT WILL BE AFFECTED!	
	PROCEED ? → NO YES	
↓	PROCEED ? NO → YES	
ENTER	CALIBRATION: → D-TO-A ADJUST BENCH CALIB. REZERO	Select *REZERO*. If digitally configured the *D-TO-A ADJUST* would not be present.
↓	CALIBRATION: D-TO-A ADJUST → BENCH CALIB. REZERO	
↓	CALIBRATION: D-TO-A ADJUST BENCH CALIB. → REZERO	
ENTER	EQUALIZE PRES. THEN HIT ENTER	Equalize pressure. Refer to the appropriate instruction.
ENTER	CONFIG. ID TAG READY	

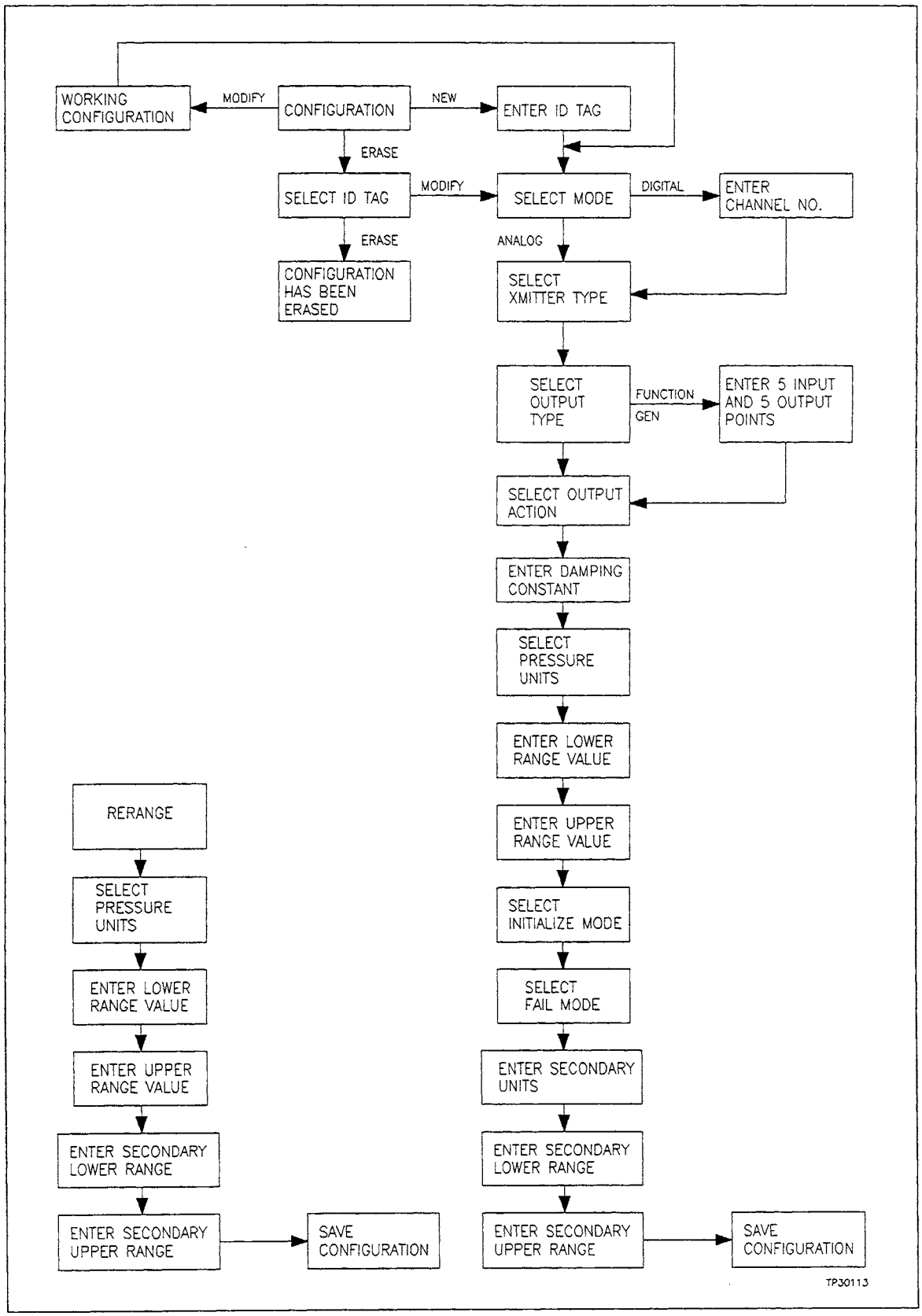


Figure A-1. Configuration/Rerange Flow Chart (Smart BCN Pressure Transmitter)

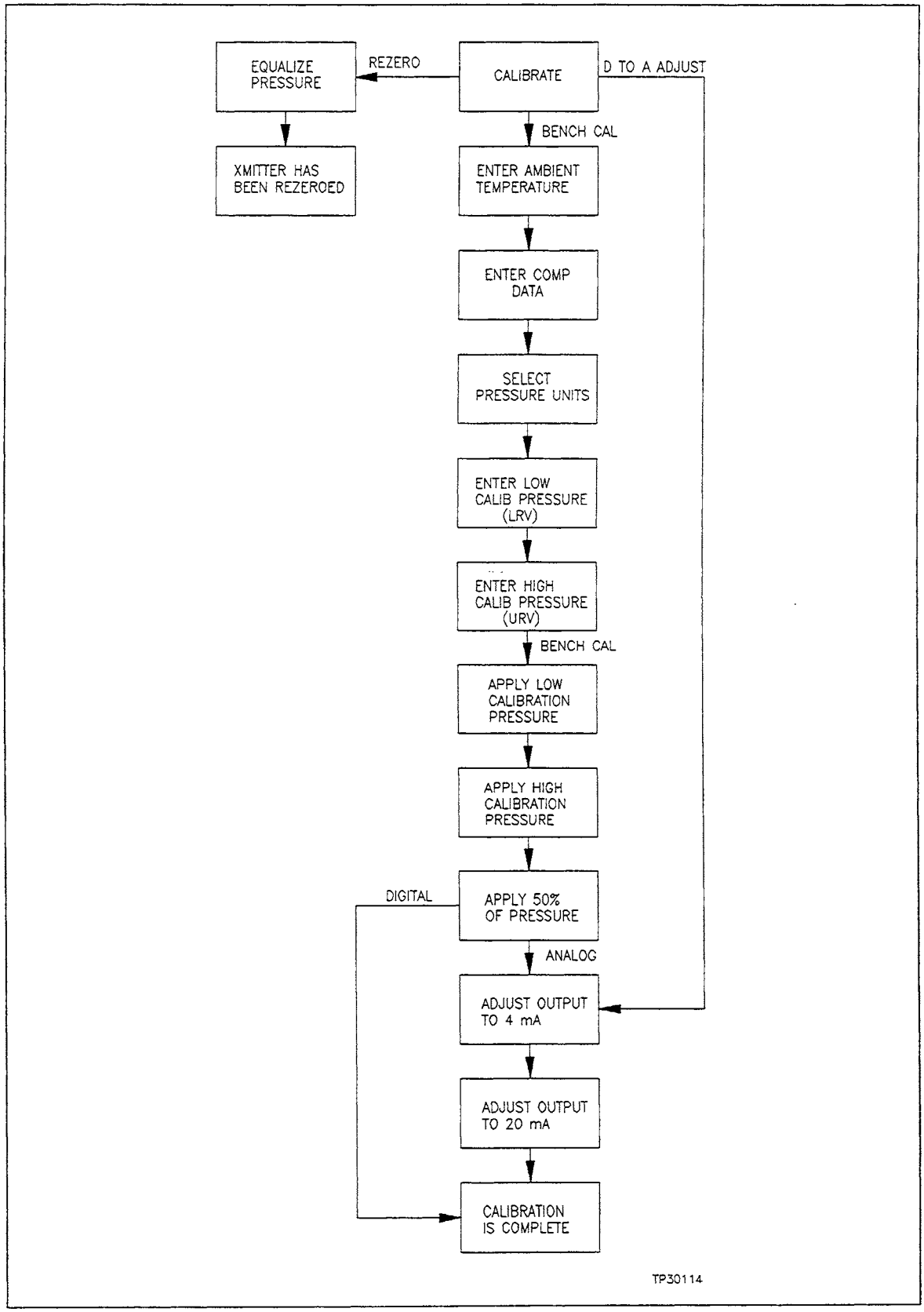


Figure A-2. Calibration Flow Chart (Smart BCN Pressure Transmitter)

APPENDIX B — TYPE EQN SMART ELECTRONIC TEMPERATURE TRANSMITTER

INTRODUCTION

The STT02 Smart Transmitter Terminal allows the user to remotely calibrate, configure, troubleshoot, and monitor the Type EQN Smart Temperature Transmitter. Refer to the **OPERATING PROCEDURES** Section of this Product Instruction for step-by-step procedures. In this Appendix deviations from these procedures, relative to the EQN Transmitter, will be discussed.

Refer to Figure B-1 for a configuration flow chart. Refer to Figure B-2 for a calibration flow chart.

Some things to note when using the STT02 with the Smart EQN Temperature Transmitter are:

When the STT02 is turned **ON**, the Bailey Logo and STT02 Software Revision Level will be displayed, followed by a communication select menu:

```
COMMUNICATION
    FORMAT
→ FSK/BUS**STT02
  BASEBAND*STT01
```

The FSK/BUS**STT02 is the communication format for all the BCN Pressure Transmitters, EQN Temperature Transmitter, and for Smart BC and EQ Transmitter that have been converted using Kit No. 258456-2.

> **NOTE**: The following procedures in this appendix are all performed in the FSK/BUS**STT02 communication format. For operation in the BASEBAND*STT01 format, refer to **APPENDIX C** through **H** for information and procedures.

If a device is not connected to the terminal when the STT02 scans the communication loop, it will display the following screens:

```
SCANNING FOR
   SMART
TRANSMITTERS
```

Followed by:

```
NO SMART
TRANSMITTER
RESPONDING
```

Followed by:

```
STT02 CONFIG.
→ [XXXXXXXXXXXX]
```

The user will only be able to access configurations previously stored in the STT02. Once a configuration is chosen the READY screen will appear, at which time the user will be able to select *CONFIG* and create a new configuration, modify or erase the working configuration, or erase any configuration.

CONFIGURATION PROCEDURE

The configuration procedure for the EQN varies slightly from the general example, which is demonstrated for a BCN Pressure Transmitter.

NOTE: A series of X's in the display portion of the function procedures indicates that an alphanumeric character can be displayed or entered in that position.

KEY	DISPLAY	COMMENTS
CONFIG	CONFIGURATION → NEW MODIFY ERASE	Select *NEW*.
ENTER	SELECT ID TAG → [XXXXXXXXXXXX]	A twelve character ID Tag name is entered within the brackets. Use the ↑ and ↓ cursor keys to select characters. Use the → to advance to the next character. When finished entering a name, press **ENTER**.
ENTER	SELECT MODE : → ANALOG DIGITAL	For this example choose *ANALOG*.

KEY	DISPLAY	COMMENTS
ENTER	TRANSMITTER TYPE → BCN EQN	Use cursor keys to select *EQN*.
↓	TRANSMITTER TYPE BCN → EQN	
ENTER	TRANSMITTER MODE → THERMOCOUPLE RTD MILLIVOLT	For this example select *THERMOCOUPLE*.
ENTER	THERMOCOUPLE → N B E J K R S T C	Select *N* type.
ENTER	APPROX. METHOD : → LINEAR NON-LINEAR	Select *LINEAR*.
ENTER	FUNC GENERATOR → NO YES	If *YES* is selected, five input and output points must be entered between zero and one hundred percent.
ENTER	OUTPUT ACTION : → NORMAL REVERSE	Refer to applicable Product Instruction for description.
ENTER	DAMPING : (0 - 32 SEC) _XX.XX	Enter a value between zero and thirty-two. Refer to applicable Product Instruction for description.
ENTER	ENGINEERING UNIT → °C °F °K	Choose the desired temperature unit.

KEY	DISPLAY	COMMENTS
ENTER	LOWER RANGE VAL. XX.XX °C UPPER RANGE VAL. XX.XX °C	Enter lower range temperature value and press **ENTER**. Input upper range temperature value.
ENTER	INTIALIZE MODE: → LOW HIGH	Refer to applicable Product Instruction for description.
ENTER	FAIL MODE : → LOW HIGH LAST	
ENTER	ENTER SECONDARY UNITS _XXXXXX	Six character, user familiar units to describe output.
ENTER	SECONDARY L.R. XX.XX UNITS SECONDARY U.R. XX.XX UNITS	Input lower range value and press **ENTER**. Input upper range value.
ENTER	STORE THIS CONFIGURATION ? → NO YES	
↓	STORE THIS CONFIGURATION ? NO → YES	This configuration will reside in the STT02 memory.

Located in the back of this manual are configuration worksheets for each device. If filled out, they provide the user with a hard copy of the configuration. Make several copies of the applicable worksheet for future use.

NOTE: After a device has been connected to the STT02, a configuration must be sent to the device before calibrating it. This can be done by selecting **SEND CONFIG** (Refer to **Send Configuration Procedure** located under **OPERATING PROCEDURES**).

CALIBRATION PROCEDURE

When calibrating, a device must be connected to the STT02. When using a IMFBS01 Module (Field Bus), the user can have up to 15 transmitters on the bus, in which case the user would select the transmitter by using the **SELECT DEVICE** key.

NOTE: To change calibration or configuration parameters of a Smart Transmitter that is connected to an FBS01 Module, the transmitter must be taken off-line. This is done at the INFI 90 or NETWORK 90 console.

Once the device has been selected, the READY screen will be displayed. The configuration ID Tag the transmitter has been configured with will be displayed in the upper left hand corner.

The user can perform all of the functions on the key board.

Bench Calibration

KEY	DISPLAY	COMMENTS
CALI-BRATE	OUTPUT WILL BE AFFECTED!	
	PROCEED ? → NO YES	Select *YES*.
↓	PROCEED ? NO → YES	

KEY	DISPLAY	COMMENTS
ENTER	CALIBRATION → D-TO-A ADJUST BENCH CALIB.	Select *BENCH CALIB.*
↓	CALIBRATION: D-TO-A ADJUST → BENCH CALIB.	
ENTER	APPLY 0 mV SIGNAL THEN HIT ENTER	Input 0 mV to transmitter.
ENTER	APPLY 25 mV SIGNAL THEN HIT ENTER	Input 25 mV to transmitter.
ENTER	ENTER XMITTER AMBIENT TEMP. XX.XX C	Enter the transmitter's ambient temperature in degrees Celsius using the number keypad. When using a thermocouple, this temperature should be the cold junction compensation temperature. This value has a direct affect on the transmitter accuracy.
ENTER	ADJUST TO 4 mA THEN HIT ENTER	Adjust transmitter output using ↑ and ↓ cursor keys.
ENTER	ADJUST TO 20 mA THEN HIT ENTER	Adjust transmitter output using ↑ and ↓ cursor keys.
ENTER	CONFIG. ID TAG READY	Bench calibration is complete.

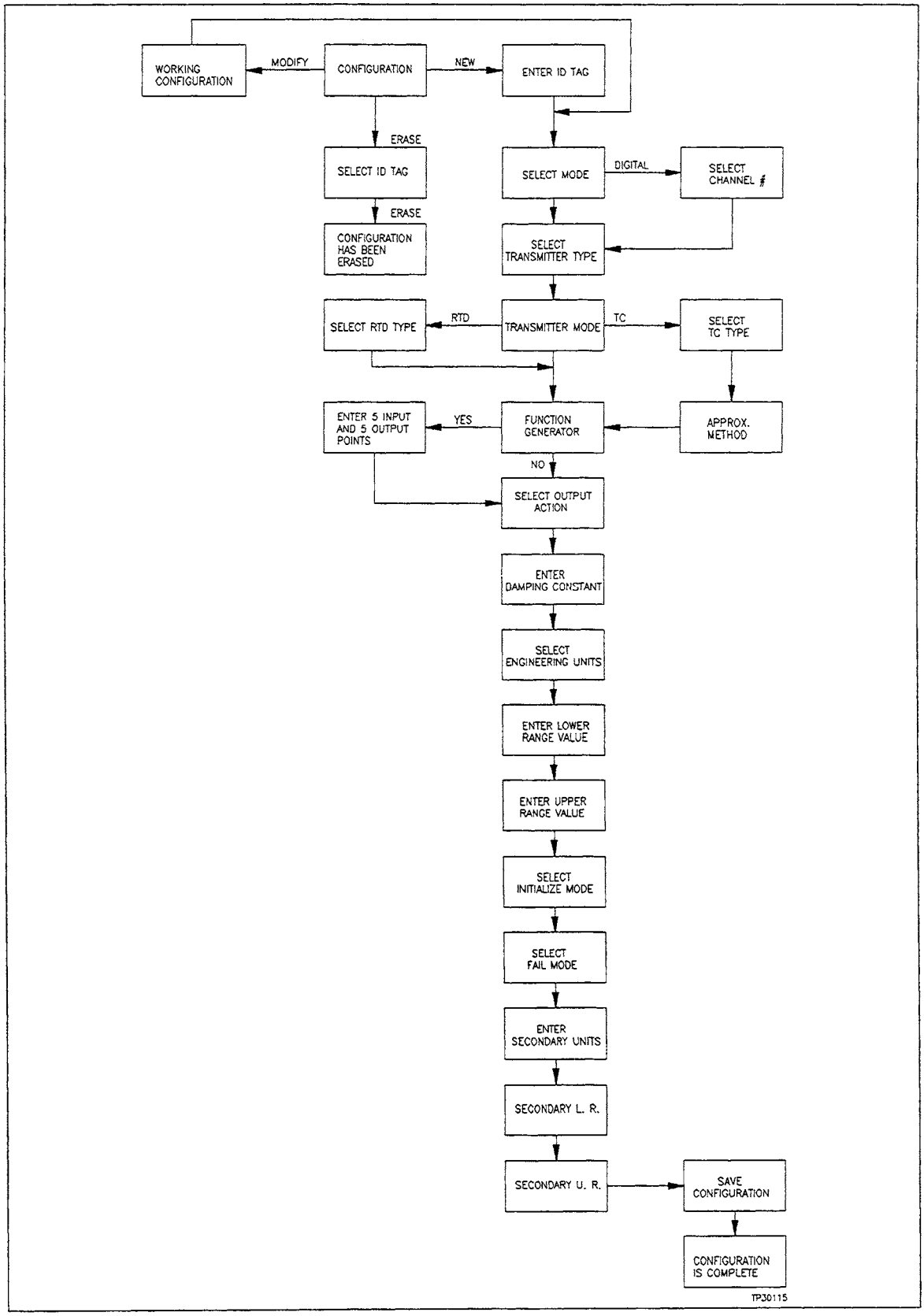


Figure B-1. Configuration Flow Chart (Smart EQN Temperature Transmitter)

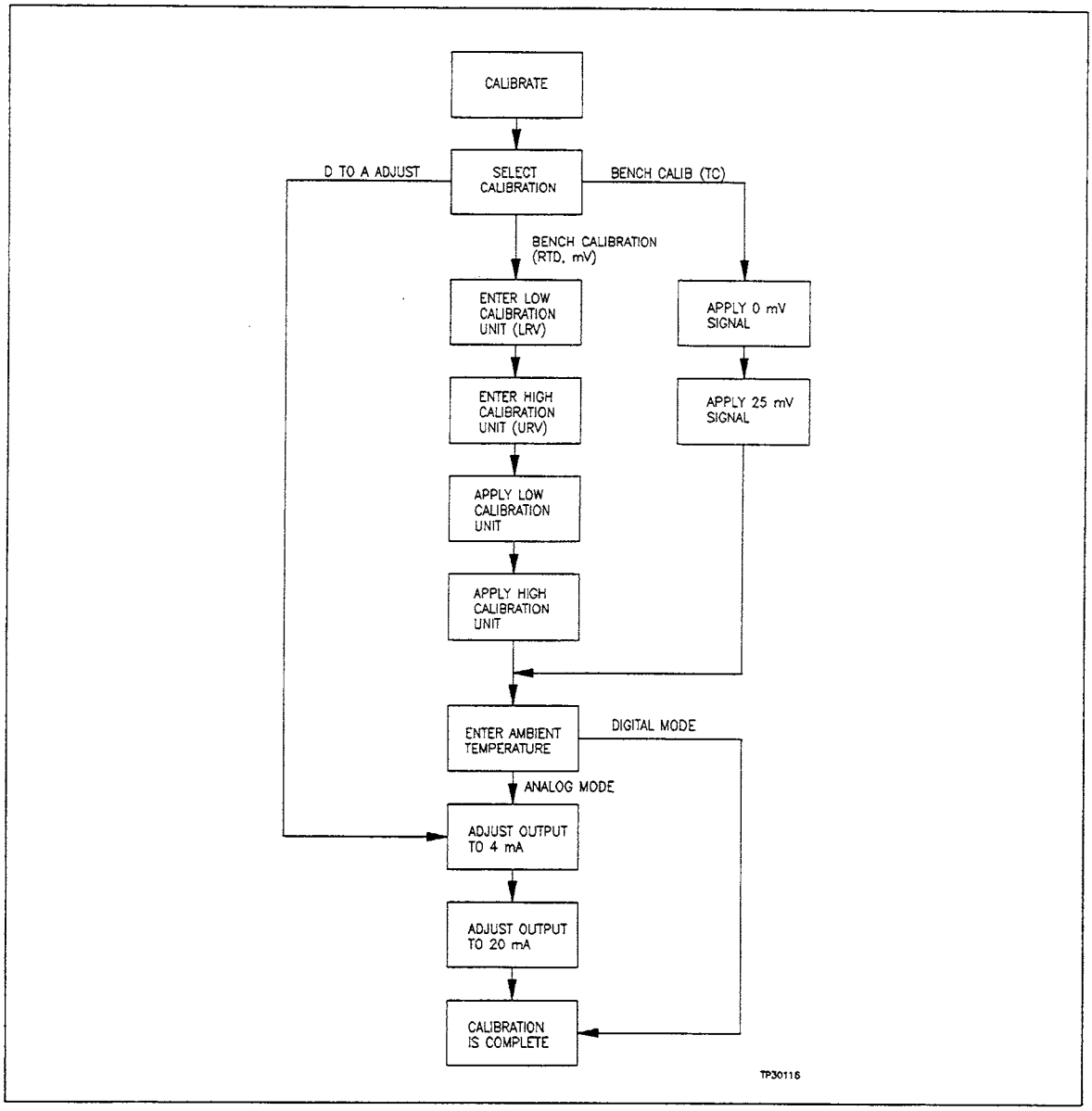


Figure B-2. Calibration Flow Chart (Smart EQN Temperature Transmitter)

APPENDIX C — TYPE BC SMART ELECTRONIC PRESSURE TRANSMITTER BASEBAND OPERATION

INTRODUCTION

The STT02 Smart Transmitter Terminal has an STT01 compatibility mode. To enter this mode select *BASEBAND*STT01*, at initial power-up.

NOTE: Adapter Cable, Bailey Kit No. 258445_1, is required for communication between baseband device and STT02.

KEY	DISPLAY	COMMENTS
ON	BAILEY CONTROLS COMPANY REVISION X_X	
	COMMUNICATION FORMAT → FSK/BUS**STT02 BASEBAND*STT01	Choose *BASEBAND*.
↓	COMMUNICATION FORMAT FSK/BUS**STT02 → BASEBAND*STT01	
ENTER	USE CORD WITH JACK CONNECTOR	Cord connector attaches to the back of STT02. The jack of cord connector plugs into the receptacle of target device.
	SELECT DEVICE: → BC TRANSMITTER TEMP. XMITTER ASI MASS FLOWMETER pH METER ORP/SPEC. ION VORTEX	**NOTE:** The STT02 can only display three devices on the screen at one time. Use the ↑ and ↓ cursor keys to view the entire list of devices.

The STT02 can remotely calibrate, configure, troubleshoot, and monitor the Smart BC Pressure Transmitter. This Appendix provides information and procedures relative to the BC Transmitter. The **Bench Calibration, Rezero** and **Manifold Positioning** procedures, relative to the Smart BC Transmitter, are also included in this Appendix.

Refer to Figure C-1 for a configuration procedure flow chart. Refer to Figure C-2 for a flow chart of the calibration procedure.

Some things to note when the STT02 is being used with the Smart BC Pressure Transmitter:

1. The keypad of the STT02 is slightly different than the STT01's. The **MANIFOLD, USER, F3** and **F4** function keys are not included on STT02 keypad:

The **MANIFOLD** functions are found under the **SPECIAL FEATURE** key on the STT02.

The **F1** and **F2** keys are present, but have no function when addressing the BC transmitter.

2. During Calibration and Configuration of the Smart BC Transmitter, pressure units should be selected from the following displayed menu:

```
SELECT ENG.UNITS
→ MPA  BAR    IH2O
  KPA  mBAR   mmH2
  PSI  mmHG
```

NOTE: Changing engineering units will automatically convert the upper and lower range values to this new unit. However, if the converted upper and lower range values would be greater than 9999 or less than -9999, the transmitter would not accept this command and the communications error message will result.

CONFIGURATION PROCEDURE

The NEW function allows the user to input and save a complete configuration. The MODIFY function allows the user to change an existing configuration.

A configuration can be created without the STT02 being connected to a target device. A number of configurations can be entered and stored in the STT02 to be sent to a transmitter at a later time with the **SEND CONFIG** key.

NOTE: The STT02 is assumed to be in the READY state when beginning the following procedures.

KEY	DISPLAY	COMMENTS
CONFIG	CONFIGURATION → NEW MODIFY ERASE	Select *NEW*. **NOTE**: To modify an existing configuration, select *MODIFY.* The screen sequence is the same, however, the MODIFY screens will appear with the values and cursor positions as they were originally configured.
ENTER	ENTER TAG ID: ^	The user enters a name for the configuration (Tag ID) using up to 12 ASCII characters. To select a character, scroll through the available list (refer to Table 4-3) using the ↑ and ↓ cursor keys. Use the → cursor key to move to the next digit. To change a character, use the ← cursor key to backspace.
ENTER	OUTPUT TYPE: → LINEAR SQUARE ROOT FUNCTION GEN.	Select *LINEAR*. If *FUNCTION GEN.* is chosen as an output, five input and output points need to be entered as a percentage of input. The first and last points on the curve are assumed to 0.00% and 100.00%, the five points to be specified should be between these two values.
ENTER	OUTPUT ACTION: → NORMAL REVERSE	Move the indicator to your selection. (Refer to the applicable Product Instruction for an explanation of terms.)
ENTER	DAMPING : (0-32 SEC) XX.XX SEC	Enter a value from 0.00 to 32.00 seconds.

KEY	DISPLAY	COMMENTS
ENTER	SELECT ENG.UNITS → MPA BAR IH2O KPA mBAR mmH2 PSI mmHG	Choose desired engineering units.
ENTER	LOWER RANGE VAL. X.XX UNITS UPPER RANGE VAL. X.XX UNITS	Input lower range value using the cursor keys, then press **ENTER**. Input the upper range value, then press **ENTER**. The displayed units are those the user selected in the previous step.
ENTER	INITIALIZE MODE: → LOW HIGH	Make selection using cursor keys. Refer to the applicable Product Instruction for mode description.
ENTER	FAIL MODE : → LOW HIGH LAST	Make selection using cursor keys.
ENTER	SAVE CONFIG. NO ← YES	Make selection using cursor keys.
↓	SAVE CONFIG. NO YES ←	
ENTER	READY	Configuration is completed.

Located in the back of this manual are configuration worksheets for each device. If filled out, they provide the user with a hard copy of the configuration. Make several copies of the applicable worksheet for future use.

CALIBRATION PROCEDURE

The functions of the STT02 allow the user to bench calibrate, rezero and perform D-to-A adjustment to the target device.

Bench Calibration Procedure

The procedure for bench calibration of the Smart BC Transmitter is as follows:

NOTE: This procedure requires an input to the target device. Do not step through this procedure without a source applied to the device, otherwise both the HIGH and LOW inputs will be set at zero and the output will be meaningless.

KEY	DISPLAY	COMMENTS
CALI-BRATE	CALIBRATION: → D-TO-A ADJUST BENCH CALIB. REZERO	Select *BENCH CALIB.*
↓	CALIBRATION: D-TO-A ADJUST → BENCH CALIB. REZERO	
ENTER	ENTER XMITTER AMBIENT TEMP. XX.XX C	Enter the transmitter's ambient temperature in degrees Celsius using the number keypad. **NOTE**: The default value is 25°C.
ENTER	SELECT ENG.UNITS → MPA BAR IH2O KPA mBAR mmH2 PSI mmHG	Make selection using the cursor keys.
ENTER	LOW CALIB. PRES. XX.XX UNITS HIGH CALIB PRES. XXX.XX UNITS	Enter desired lower range value using the number keys. Press **ENTER**. Input upper range value in the same way. Note that the pressure units shown are those that were selected in the preceding step.
ENTER	APPLY LOW CALIB PRESSURE THEN HIT ENTER	Apply lower range value to the input per transmitter calibration instructions.

KEY	DISPLAY	COMMENTS
ENTER	APPLY HIGH CALIB PRESSURE THEN HIT ENTER	Apply upper range value to the input per transmitter calibration instructions.
ENTER	APPLY 50% OF PRESSURE THEN HIT ENTER	Apply pressure per transmitter calibration instructions.
ENTER	ADJUST TO 4 mA THEN HIT ENTER	Adjust transmitter output using ↑ and ↓ cursor keys.
ENTER	ADJUST TO 20 mA THEN HIT ENTER	Adjust transmitter output using ↑ and ↓ cursor keys.
ENTER	READY	Bench calibration is complete.

Rezero Procedure

The **Rezero** procedure allows the user to zero the transmitter without going through the complete **Bench Calibration** procedure.

KEY	DISPLAY	COMMENTS
CALI–BRATE	CALIBRATION: → D-TO-A ADJUST BENCH CALIB. REZERO	Select *REZERO.*
↓	CALIBRATION: D-TO-A ADJUST → BENCH CALIB. REZERO	
↓	CALIBRATION: D-TO-A ADJUST BENCH CALIB. → REZERO	
ENTER	WORKING	
	EQUALIZE PRES. THEN HIT ENTER	Equalize pressure per transmitter calibration instructions.
ENTER	READY	

Square Root Procedure

A Square Root output is available on the Smart BC Pressure Transmitters to allow for flow measurement; therefore, the Output Type menu is displayed as follows:

```
OUTPUT TYPE:
→ LINEAR
  SQUARE ROOT
  FUNCTION GEN.
```

Manifold Procedure (SPECIAL FEATURE)

The **SPECIAL FEATURE** key allows the BC Transmitter user to operate a remotely actuated pressure manifold through the STT02 Terminal. The **Manifold Positioning** procedure is as follows:

KEY	DISPLAY	COMMENTS
SPECIAL FEATURE	MANIFOLD MENU: → ZERO POSITION RUN POSITION AUTO REZERO	Make selection using cursor keys.
ENTER	OUTPUT WILL BE AFFECTED!	**NOTE**: Use of this function will result in an output that does not correspond to the input. Be sure the control loop is in manual.
	PROCEED ? NO ← YES	Enter selection by moving indicator arrow with the cursor keys. Selecting *NO* will result in the *READY* display.
↓	PROCEED ? NO YES ←	
ENTER	READY	**NOTE:** If *AUTO REZERO* is selected the screen will display *WORKING* for a few seconds.

Temperature Coefficient Display Procedure

The transducer temperature coefficients can be displayed with the STT02 using the following procedure:

KEY	DISPLAY	COMMENTS
[+/−] [.]	TEMP. COEFF. → DISPLAY VALUES INPUT NEW VAL	The ± and . keys must be pressed simultaneously.
[ENTER]	Z -25: X.XX % Z +85: X.XX % S -25: X.XX % S +85: X.XX %	Values are displayed in the following order: Zero Shift at –25°C; Zero Shift at +85°C; Span Shift at –25°C; Span Shift at +85°C.
[CLEAR]	READY	

Temperature Coefficient Input Procedure

Temperature coefficients can be input into the Smart BC Transmitter electronics with the following procedure:

KEY	DISPLAY	COMMENTS
+/– .	TEMP. COEFF. → DISPLAY VALUES INPUT NEW VAL	The ± and . keys must be pressed simultaneously.
↓	TEMP. COEFF. DISPLAY VALUES → INPUT NEW VAL	Select *INPUT NEW VAL*.
ENTER	ZERO SHIFT -25C X.XX % ZERO SHIFT +85C X.XX %	Enter value for zero shift at -25°C using the number keypad. Press **ENTER**. Enter value for zero shift at +85°C in the same way. At this point in the procedure, there is a short time delay; i.e. the zero shift coefficients will remain displayed for a few seconds while they are being sent to the transmitter. Once they have been sent, the span shift screen will be displayed.
	SPAN SHIFT -25C X.XX % SPAN SHIFT +85C X.XX %	Enter value for span shift at -25°C using the number keypad. Press **ENTER**. Enter value for span shift at +85°C in the same way.
ENTER	READY	Once the span shift values have been sent to the transmitter, the **READY** prompt will be displayed.

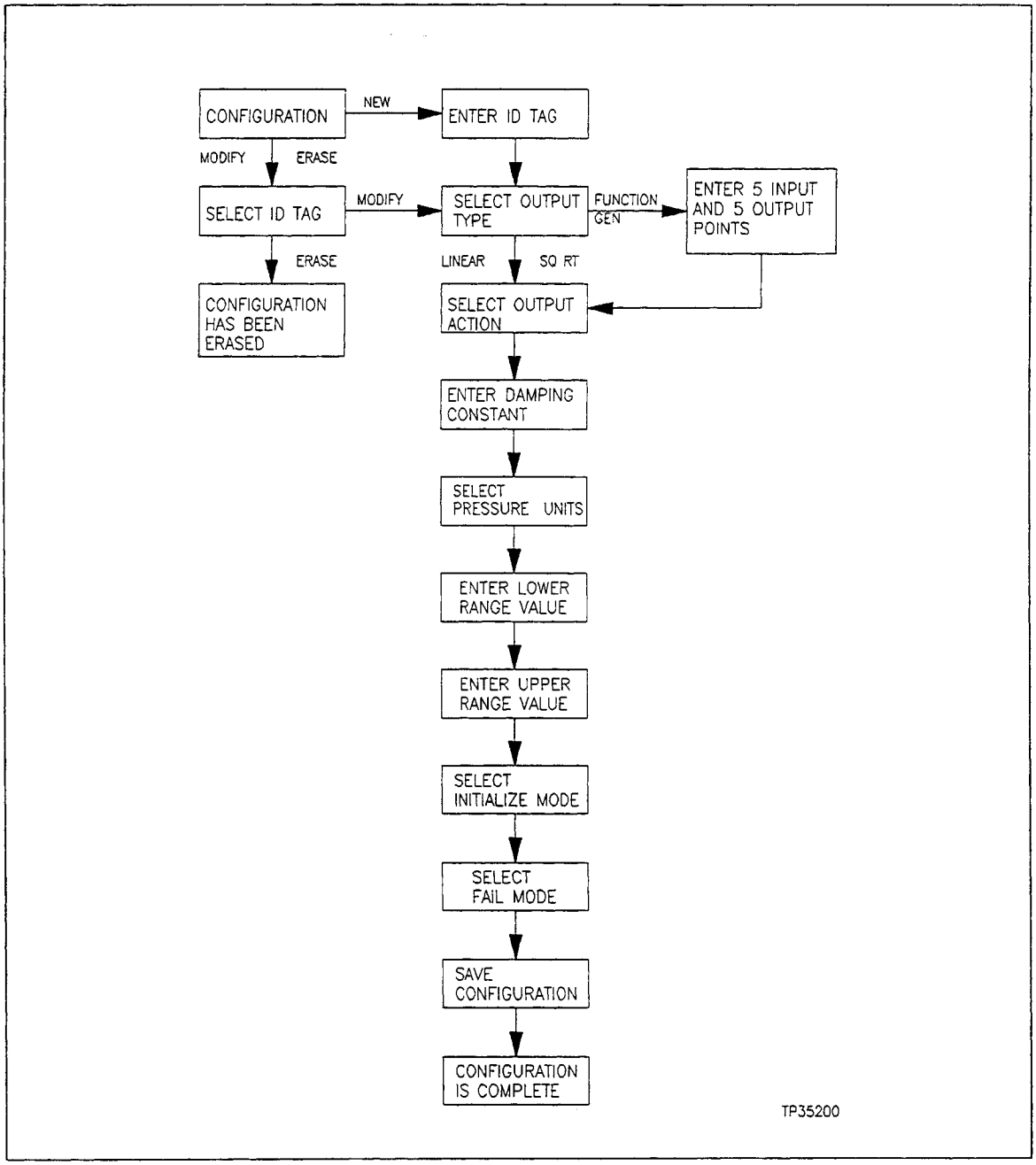


Figure C-1. Configuration Flow Chart (Smart BC Pressure Transmitter)

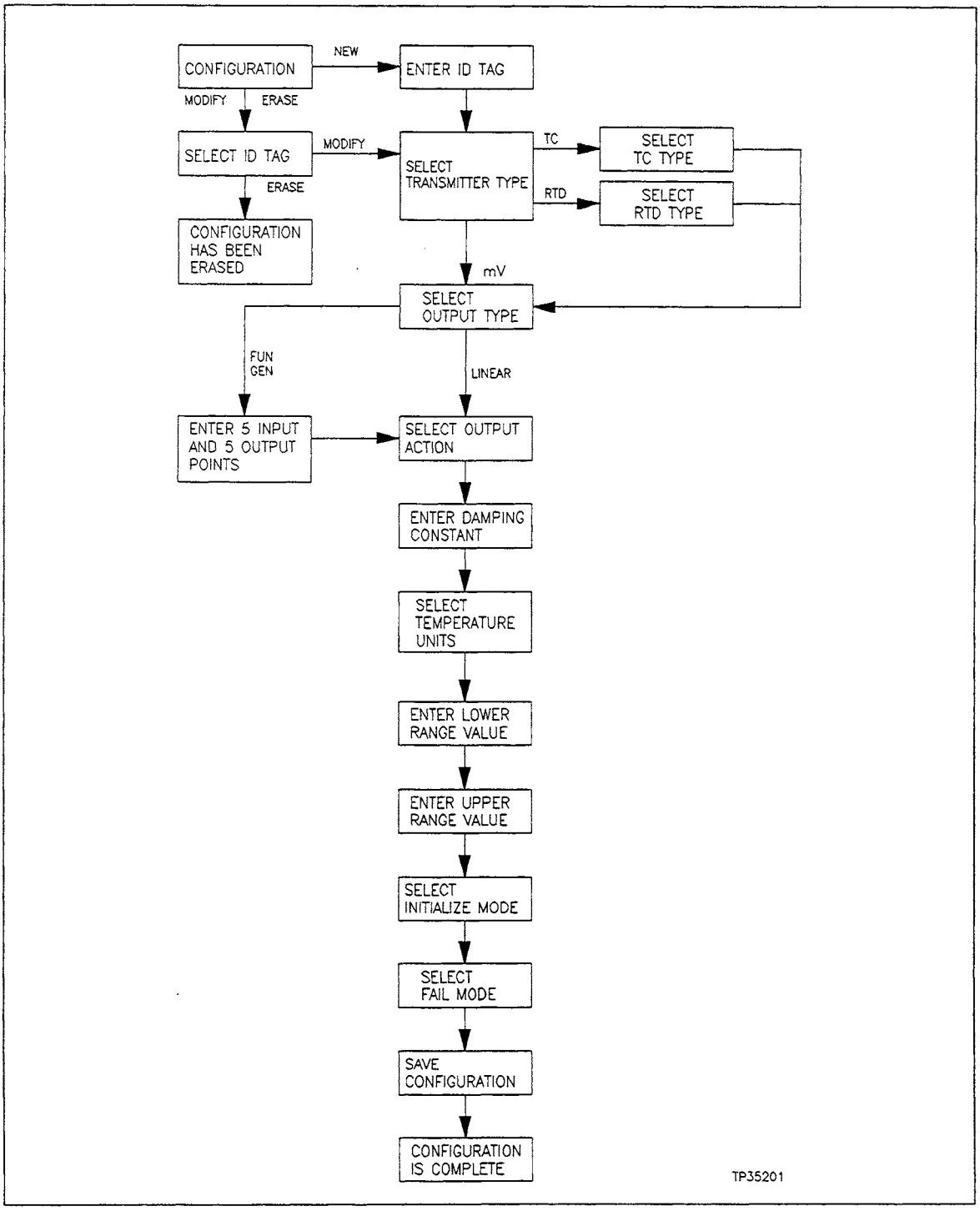


Figure C-2. Calibration Flow Chart (Smart BC Pressure Transmitter)

APPENDIX D — TYPE EQ
SMART ELECTRONIC TEMPERATURE TRANSMITTER

INTRODUCTION

The STT02 Smart Transmitter Terminal has an STT01 compatibility mode. To enter this mode select *BASEBAND*STT01*, at initial power-up.

NOTE: Adapter Cable, Bailey Kit No. 258445_1, is required for communication between baseband device and STT02.

KEY	DISPLAY	COMMENTS
ON	BAILEY CONTROLS COMPANY REVISION X_X	
	COMMUNICATION FORMAT → FSK/BUS**STT02 BASEBAND*STT01	Choose *BASEBAND*.
↓	COMMUNICATION FORMAT FSK/BUS**STT02 → BASEBAND*STT01	
ENTER	USE CORD WITH JACK CONNECTOR	Cord connector attaches to the back of STT02. The jack of cord connector plugs into the receptacle of target device.
	SELECT DEVICE: → BC TRANSMITTER TEMP. XMITTER ASI MASS FLOWMETER pH METER ORP/SPEC. ION VORTEX	**NOTE:** The STT02 can only display three devices on the screen at one time. Use the ↑ and ↓ cursor keys to view the entire list of devices.

The STT02 can remotely calibrate, configure, troubleshoot, and monitor the Smart EQ Temperature Transmitter. This Appendix provides information and procedures relative to the EQ Transmitter.

Refer to Figure D-1 for a configuration procedure flow chart. Refer to Figure D-2 for a flow chart of the calibration procedure.

Some things to note when the STT02 is being used with the Smart EQ Temperature Transmitter:

The keypad of the STT02 is slightly different than the STT01's. The **MANIFOLD, USER, F3** and **F4** function keys are not included on STT02 keypad. The **F1** and **F2** keys are present, but have no function when addressing the EQ transmitter.

CONFIGURATION PROCEDURE

When stepping through the New Configuration and Modify Configuration procedures, the following screens will be displayed after the ID TAG has been selected or entered:

```
TRANSMITTER MODE
→ THERMOCOUPLE
  RTD
  MILLIVOLT
```

If *THERMOCOUPLE* is selected, the user should select a thermocouple type (using the cursor keys) from the table displayed on the following screen:

```
THERMOCPLE TYPE:
→ B    E    R
  C    J    S
  D    K    T
```

If *RTD* is selected as the transmitter mode, the user should choose single or dual RTD (using cursor keys) from the following displayed screen:

```
→ SINGLE RTD
  DUAL RTD
```

Press **ENTER** and continue with the step-by-step procedure in **CONFIGURATION FUNCTIONS.**

NOTE: The TRANSMITTER MODE screen and the THERMOCOUPLE TYPE or SINGLE RTD/DUAL RTD screen will be viewed in the GET CONFIGURATION and VIEW CONFIGURATION procedures also.

If MILLIVOLT is chosen from the TRANSMITTER MODE screen, all measurements will be in millivolts; there will not be a units selection screen during calibration or configuration.

Located in the back of this manual are configuration worksheets for each device. If filled out, they provide the user with a hard copy of the configuration. Make several copies of the applicable worksheet for future use.

CALIBRATION PROCEDURE

When the **CALIBRATE** key is pressed, the following menu will be displayed:

```
TRANSMITTER MODE
→ THERMOCOUPLE
  RTD
  MILLIVOLT
```

The user should move the indicator arrow to the desired mode. Then press **ENTER.**

NOTE: If *THERMOCOUPLE* is selected, the user should select a thermocouple type (using the cursor keys) from the table displayed on the following screen:

```
THERMOCPLE TYPE:
→ B    E    R
  C    J    S
  D    K    T
```

If *RTD* is selected as the transmitter mode, the user should choose single or dual RTD (using cursor keys) from the following displayed screen:

```
→ SINGLE RTD
  DUAL RTD
```

Move the indicator arrow to the desired mode and press **ENTER.** The following Calibration menu will be displayed:

```
CALIBRATION:
→ D-to-A ADJUST
  BENCH CALIB.
```

D-to-A Adjustment Procedure

This option, selected under the **CALIBRATE** Key, allows the user to adjust the 4 to 20 mA output of the target device.

KEY	DISPLAY	COMMENTS
CALI– BRATE	CALIBRATION: → D-TO-A ADJUST BENCH CALIB.	Select *D-TO-A ADJUST*.
ENTER	OUTPUT WILL BE AFFECTED!	**NOTE**: The use of this function will cause a change in target device output that does not correspond to the input. Be sure the control loop is in manual.
	PROCEED ? NO ← YES	Move indicator to your selection. *NO* will result in the READY display.
↓	PROCEED ? NO YES ←	
ENTER	WORKING	
	ADJUST TO 4 mA THEN HIT ENTER	Adjust target device output to 4 mA using the ↑ and ↓ cursor keys.
ENTER	ADJUST TO 20 mA THEN HIT ENTER	Adjust target device output to 20 mA using the ↑ and ↓ cursor keys.
ENTER	READY	

Bench Calibration Procedure

KEY	DISPLAY	COMMENTS
ENTER	CALIBRATION: → D-TO-A ADJUST BENCH CALIB.	Select *BENCH CALIB.*
↓	CALIBRATION: D-TO-A ADJUST → BENCH CALIB.	
ENTER	W O R K I N G	The following screen is displayed only if the transmitter is in the thermocouple mode.
	INPUT 25 mV SIGNAL THEN HIT ENTER	Input 25 mV per transmitter calibration instructions.
ENTER	ENTER XMITTER AMBIENT TEMP. XX.XX C	Enter the transmitter's ambient temperature in degrees Celsius using the number keypad. **NOTE**: The default value is 25 °C.
ENTER	SELECT TEMP.UNIT → CELSIUS FAHRENHEIT KELVIN	Make selection using the cursor keys.
ENTER	LOW CALIB. TEMP. XXX.XX UNITS HIGH CALIB TEMP. XXX.XX UNITS	Enter desired lower range value using the number keypad. Press **ENTER**. Input upper range value in the same way. Note that the units shown are those that were selected in the preceding step.
ENTER	APPLY LOW CALIB TEMPERATURE THEN HIT ENTER	Apply lower range value to the input per transmitter calibration instructions.

KEY	DISPLAY	COMMENTS
ENTER	APPLY HIGH CALIB TEMPERATURE THEN HIT ENTER	Apply upper range value to the input per transmitter calibration instructions.
ENTER	ADJUST TO 4 mA THEN HIT ENTER	Adjust transmitter output using ↑ and ↓ cursor keys.
ENTER	ADJUST TO 20 mA THEN HIT ENTER	Adjust transmitter output using ↑ and ↓ cursor keys.
ENTER	READY	Bench calibration is complete.

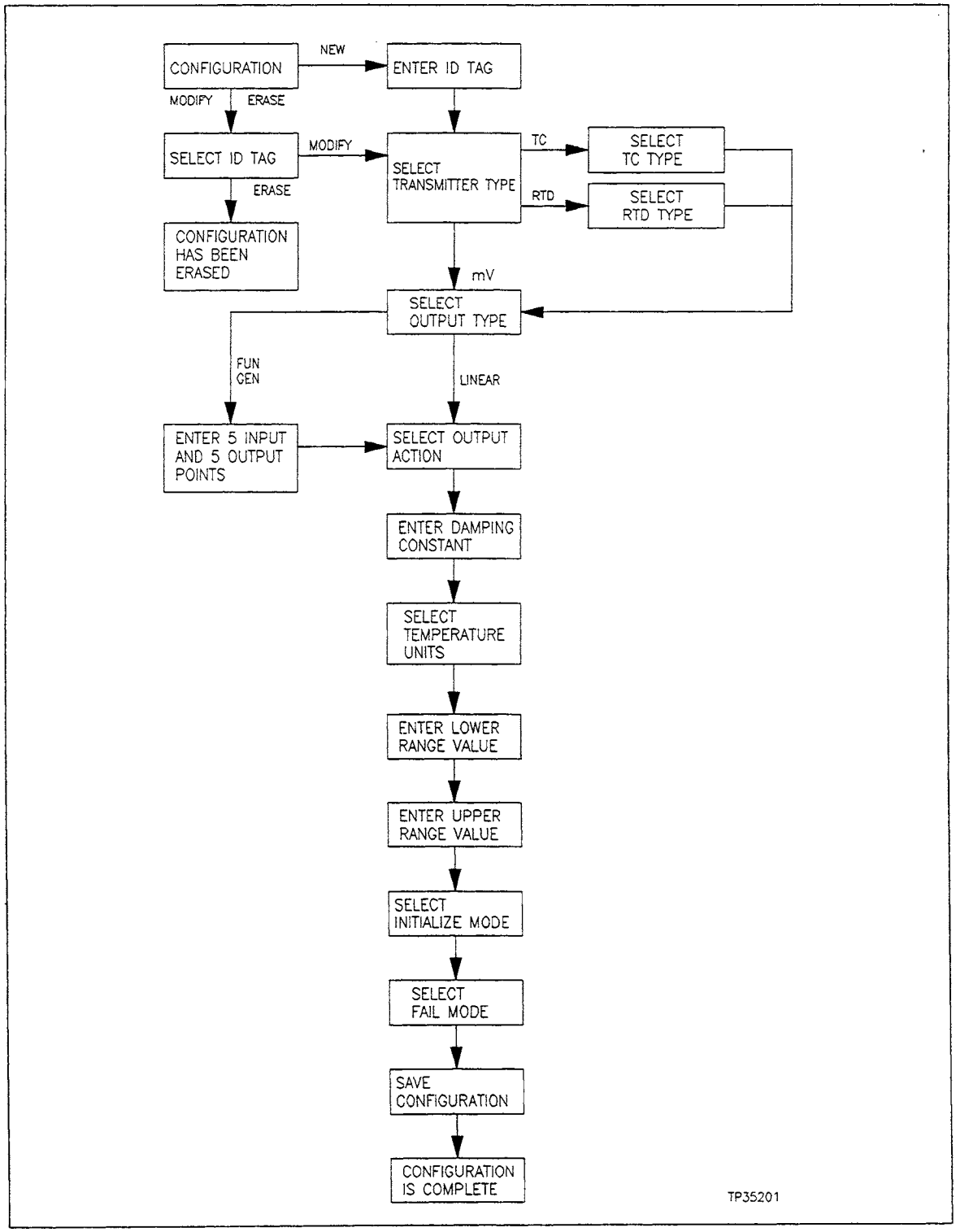


Figure D-1. Configuration Flow Chart (Smart EQ Temperature Transmitter)

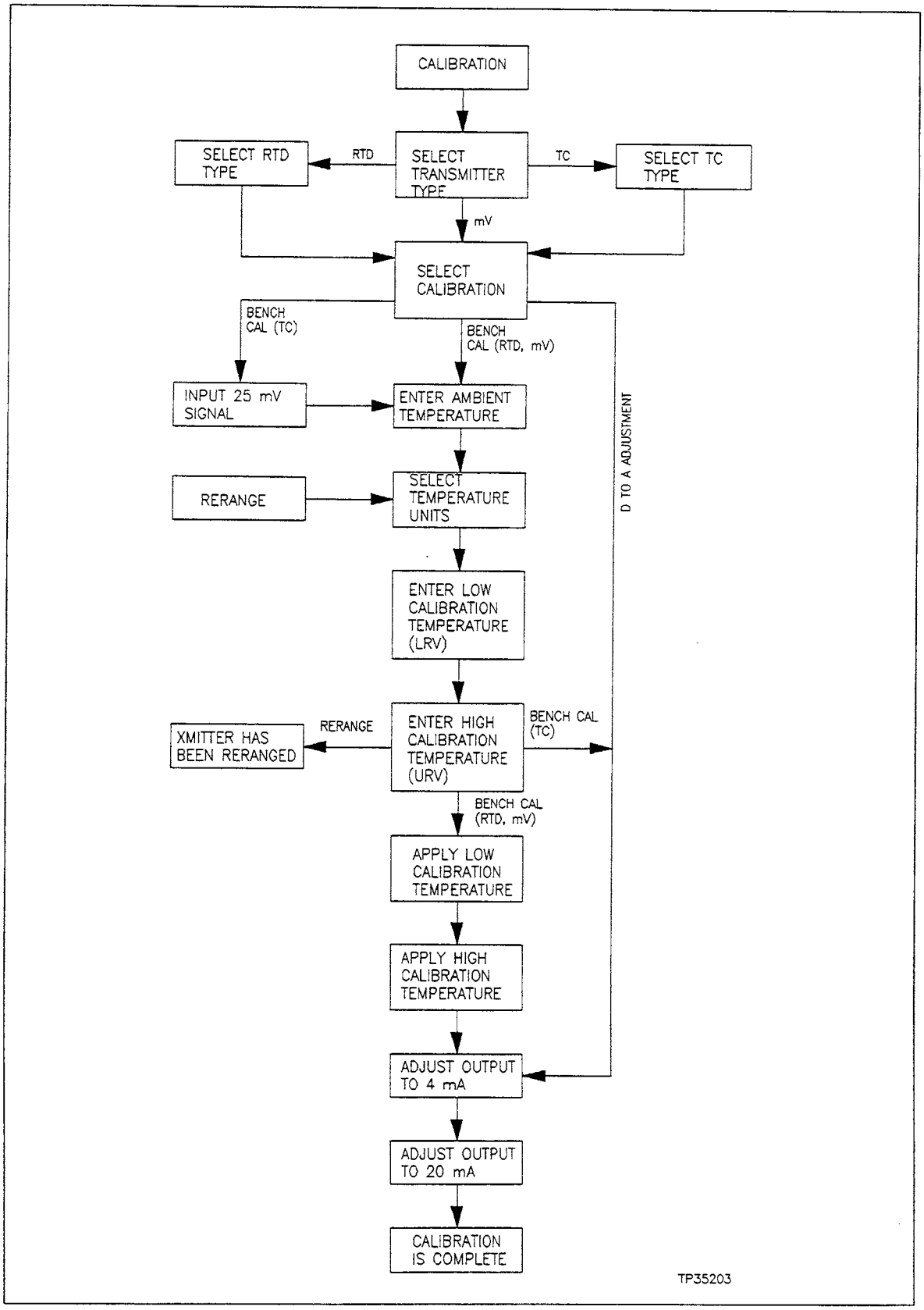


Figure D-2. Calibration Flow Chart (Smart EQ Temperature Transmitter)

APPENDIX E
NETWORK 90 ANALOG SLAVE INPUT MODULE

INTRODUCTION

The STT02 Smart Transmitter Terminal has an STT01 compatibility mode. To enter this mode select *BASEBAND*STT01*, at initial power-up.

NOTE: Adapter Cable, Bailey Kit No. 258445_1, is required for communication between baseband devices and STT02.

KEY	DISPLAY	COMMENTS
ON	BAILEY CONTROLS COMPANY REVISION X_X	
	COMMUNICATION FORMAT → FSK/BUS**STT02 BASEBAND*STT01	Choose *BASEBAND.*
↓	COMMUNICATION FORMAT FSK/BUS**STT02 → BASEBAND*STT01	
ENTER	USE CORD WITH JACK CONNECTOR	Cord connector attaches to the back of STT02. The jack of cord connector plugs into the receptacle of target device.
	SELECT DEVICE: → BC XMITTER TEMP. XMITTER ASI MASS FLOWMETER pH METER ORP/SPEC. ION VORTEX	Use ↓ cursor key to select *ASI.*

The STT02 allows remote monitoring of the target device through the NETWORK 90 Analog Slave Input Module.

NOTE: The NASI01 does not allow the user to configure or calibrate a target device using the STT02.

Note that the indicator arrow points to the device previously selected. Move the arrow to *ASI* using the cursor keys.

NOTE: Only four lines of the above screen are displayed at one time. The ↑ and ↓ cursor keys allow the user to scroll the screen. Press **ENTER**. The following screen will be be displayed:

```
SELECT COMMUN.
CHANNEL (0-14)

 CHANNEL:
```

At this point, the user should input a channel number using the keypad; then press **ENTER**. The following will be displayed:

```
CHANNEL: XX

   READY
(F2 - SEL.CHAN)
```

NOTE: This screen will be displayed in place of the READY prompt, displaying the current communication channel and allowing the user the option to change the channel with the **F2** key.

The STT02 has a low priority when trying to communicate with a target device through the ASI. In effect, if the ASI is busy when the user attempts to perform a function via the STT02, the following will be displayed.

```
ASI BUSY
(RETRY)
```

Communication between the STT02 and the target device via the NASI01 is limited to the following:

1. The user is able to view and/or save the configuration of the target device on the selected channel by using the **GET CONFIG** key.

2. The **STATUS** key allows the user to check the status of The target device.

3. The **OUTPUT** key allows the user to monitor the output (*MON. OUTPUT*) or input (*MON. INPUT*) of the target device. However, the FIX OUTPUT function is non - operational via the NASI02.

> **NOTE**: If the target device is in the Fix Output (FO), Span Output (SO), or Zero Output (ZO) mode, per a command sent via the Multi-Function Controller, the user will be able to monitor the input or output of the target device using the **OUTPUT** Key on the STT02. The STT02 will display the input to the device in Engineering Units; the output will be displayed as % of input, i.e. to the fixed % (FO), 100% (SO), or 0% (ZO).]

4. The ID TAG of the target device on the selected channel can be changed via the **SEND CONFIG** key. Note that the ID TAG is the only part of the configuration that can be changed. All other calibration and configuration functions are non-operational when the STT02 is connected to the NASI01.

Located in the back of this manual are configuration worksheets for each device. If filled out, they provide the user with a hard copy of the configuration. Make several copies of the applicable worksheet for future use.

APPENDIX F — TYPE pH SMART ELECTRONIC TRANSMITTER (pH MEASUREMENT)

INTRODUCTION

The STT02 Smart Transmitter Terminal has an STT01 compatibility mode. To enter this mode select *BASEBAND*STT01*, at initial power-up.

NOTE: Adapter Cable, Bailey Kit No. 258445_1, is required for communication between baseband devices and STT02.

KEY	DISPLAY	COMMENTS
ON	BAILEY CONTROLS C O M P A N Y REVISION X_X	
	COMMUNICATION FORMAT → FSK/BUS**STT02 BASEBAND*STT01	Choose *BASEBAND*.
↓	COMMUNICATION FORMAT FSK/BUS**STT02 → BASEBAND*STT01	
ENTER	USE CORD WITH JACK CONNECTOR	Cord connector attaches to the back of STT02. The jack of cord connector plugs into the receptacle of target device.
	SELECT DEVICE: → BC XMITTER TEMP. XMITTER ASI MASS FLOWMETER pH METER ORP/SPEC. ION VORTEX	Use ↓ cursor key to select *pH METER*.

The STT02 Smart Transmitter Terminal allows the user to remotely calibrate, configure, troubleshoot, and monitor the Type pH Transmitter. The **Bench Calibration** and **Process Calibration** Procedures for the Smart PH Meter are also included in this Appendix.

Refer to Figure F-1 for a Configuration procedure flow chart. Refer to Figure F-2 for a flow chart of the Calibration procedure. (Note that the rerange procedure is included in the bench calibration procedure.)

Some things to note when using the STT02 with the Smart pH Meter for pH measurements are:

All pH measurements are made in units of pH; therefore, there is no units selection screen during calibration or configuration.

The keypad of the STT02 is slightly different than the STT01's. The **MANIFOLD**, **USER**, **F3** and **F4** function keys are not included on STT02 keypad. The **F1** and **F2** keys are present, but have no function when addressing the pH transmitter.

Located in the back of this manual are configuration worksheets for each device. If filled out, they provide the user with a hard copy of the configuration. Make several copies of the applicable worksheet for future use.

CONFIGURATION PROCEDURE

The NEW function allows the user to input and save a complete configuration. The MODIFY function allows the user to change an existing configuration.

A configuration can be created without the STT02 being connected to a target device. A number of configurations can be entered and stored in the STT02 to be sent to a transmitter at a later time with the **SEND CONFIG** key.

NOTE: The STT02 is assumed to be in the READY state when beginning the following procedures.

KEY	DISPLAY	COMMENTS
CONFIG	CONFIGURATION → NEW MODIFY ERASE	Select *NEW*. **NOTE**: To modify an existing configuration, select *MODIFY*. The screen sequence is the same, however, the MODIFY screens will appear with the values and cursor positions as they were originally configured.
ENTER	ENTER TAG ID: ^	The user enters a name for the configuration (Tag ID) using up to 12 ASCII characters. To select a character, scroll through the available list (refer to Table 4-3) using the ↑ and ↓ cursor keys. Use the → cursor key to move to the next digit. To change a character, use the ← cursor key to backspace.
ENTER	OUTPUT TYPE: → LINEAR FUNCTION GEN.	Select *LINEAR*. If *FUNCTION GEN.* is chosen as an output, five input and output points need to be entered as a percentage of input. The first and last points on the curve are assumed to 0.00% and 100.00%, the five points to be specified should be between these two values.
ENTER	OUTPUT ACTION: → NORMAL REVERSE	Move the indicator to your selection. (Refer to the applicable Product Instruction for an explanation of terms.)
ENTER	DAMPING : (0-32 SEC) XX.XX SEC	Enter a value from 0.00 to 32.00 seconds.

KEY	DISPLAY	COMMENTS
ENTER	LOWER RANGE VAL. X.XX pH UPPER RANGE VAL. X.XX pH	Input lower range value using the cursor keys, then press **ENTER**. Input the upper range value, then press **ENTER**.
ENTER	INITIALIZE MODE: → LOW HIGH	Make selection using cursor keys. Refer to the applicable Product Instruction for mode description.
ENTER	FAIL MODE : → LOW HIGH LAST	Make selection using cursor keys.
ENTER	SAVE CONFIG. NO ← YES	Make selection using cursor keys.
↓	SAVE CONFIG. NO YES ←	
ENTER	READY	Configuration is completed.

CALIBRATION PROCEDURE

Bench Calibration Procedure

The **Bench Calibration** procedure for pH measurements with the Smart PH Meter is as follows:

KEY	DISPLAY	COMMENTS
CALI-BRATE	CALIBRATION: → D-TO-A ADJUST BENCH CALIB. PROCESS CAL.	Select *BENCH CALIB.*
↓	CALIBRATION: D-TO-A ADJUST → BENCH CALIB. PROCESS CAL.	
ENTER	ENTER SOLUTION TEMPERATURE XX.XX C	Enter solution temperature in °C using the number keypad. Default value is 25 °C.
ENTER	ENTER PH REFERENCE VALUE XX.XX PH	Enter pH reference value using the number keypad. Limits are 0.00 to 14.00. Default value is 7.
ENTER	SEL. TEMPERATURE COMPENSATION: → NERS.ONLY BOTH SOLN.ONLY NONE	Move indicator arrow to desired compensation using cursor keys. (Refer to transmitter Product Instruction for an explanation of terms.)
ENTER	LOWER RANGE VAL. XX.XX pH UPPER RANGE VAL. XX.XX pH	Enter lower range value using the number keypad. Press **ENTER**. Enter upper range value in the same way.
ENTER	APPLY LOW CALIB PH THEN HIT ENTER	Apply lower range value to the input per transmitter calibration instructions.
ENTER	APPLY HIGH CALIB PH THEN HIT ENTER	Apply upper range value to the input per transmitter calibration instructions.

KEY	DISPLAY	COMMENTS
ENTER	WORKING	
	ADJUST TO 4mA THEN HIT ENTER	Adjust transmitter output using ↑ and ↓ cursor keys.
ENTER	ADJUST TO 20mA THEN HIT ENTER	Adjust transmitter output using ↑ and ↓ cursor keys.
ENTER	READY	Bench calibration is complete.

Process Calibration Procedure

The **Process Calibration** procedure for pH measurements with the Smart PH Meter is as follows:

KEY	DISPLAY	COMMENTS
CALI– BRATE	CALIBRATION: → D-TO-A ADJUST BENCH CALIB. PROCESS CAL.	Select *PROCESS CAL.*
↓	CALIBRATION: D-TO-A ADJUST → BENCH CALIB. PROCESS CAL.	
↓	CALIBRATION: D-TO-A ADJUST BENCH CALIB. → PROCESS CAL.	
ENTER	ENTER SOLUTION TEMPERATURE XX.XX C	Enter solution temperature in °C using the number keypad. Default value is 25 °C.
ENTER	ENTER PH REFERENCE VALUE XX.XX PH	Enter pH reference value using the number keypad. Limits are 0.00 to 14.00. Default value is 7.
ENTER	W O R K I N G	The following screen displays the temperature compensation selected during the bench calibration procedure.
	NERNSTIAN TEMP. COMPENSATION SELECTED (PRESS ENTER)	
ENTER	ENTER PH OF PROCESS XX.XX PH	Enter pH value using the number keypad. Limits are: 0.00 to 14.00. Default value is 0.

KEY	DISPLAY	COMMENTS
ENTER	ENTER ELECTRODE EFFICIENCY: XX %	Enter electrode efficiency using the number keypad. Limits are 0 to 100%. Default value is 98%.
ENTER	WORKING	
ENTER	ADJUST TO 4mA THEN HIT ENTER	Adjust transmitter output using ↑ and ↓ cursor keys.
ENTER	ADJUST TO 20mA THEN HIT ENTER	Adjust transmitter output using ↑ and ↓ cursor keys.
ENTER	READY	Process calibration is complete.

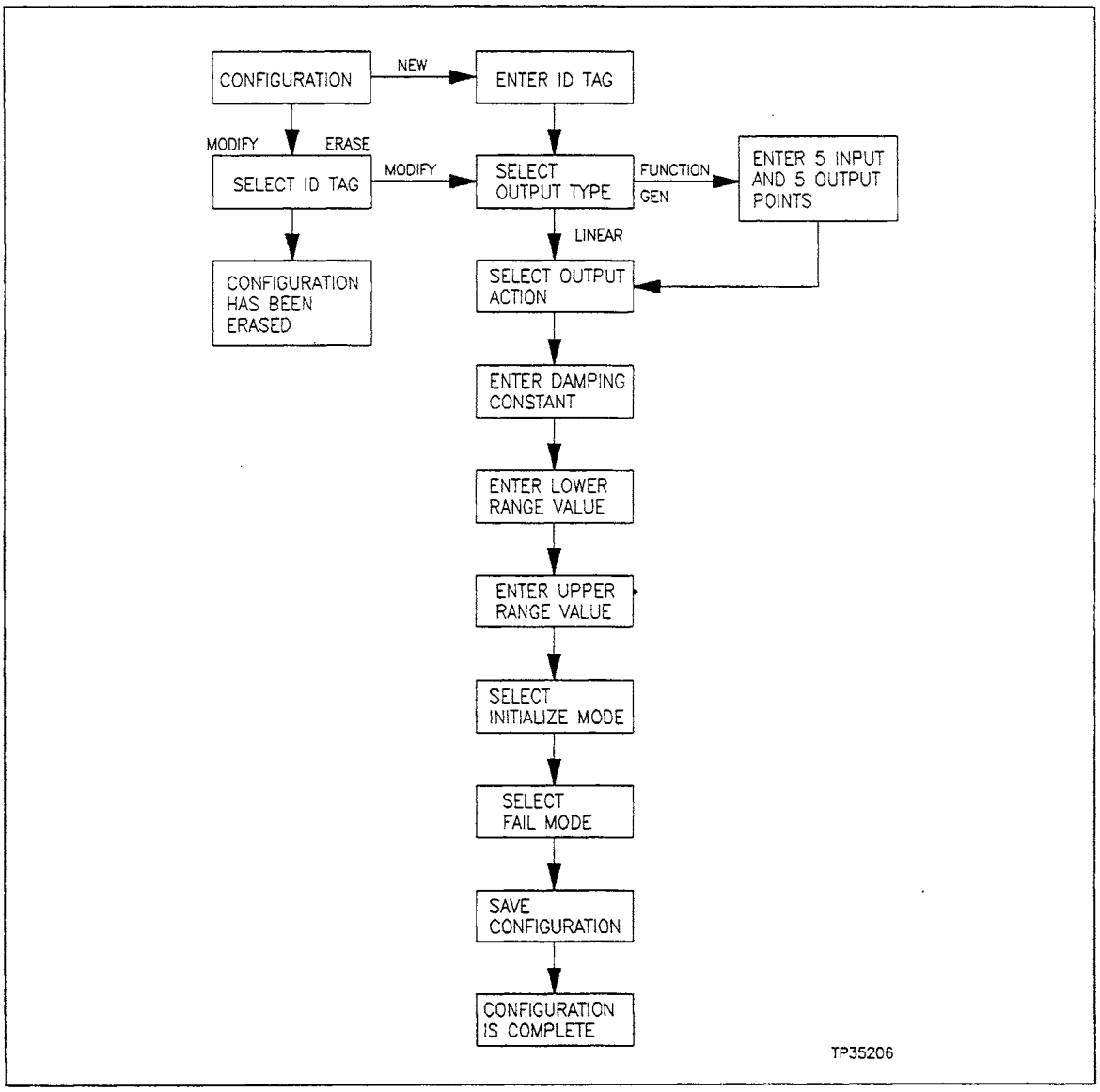


Figure F-1. Configuration Flow Chart
(Type pH Smart Transmitter - pH Measurement)

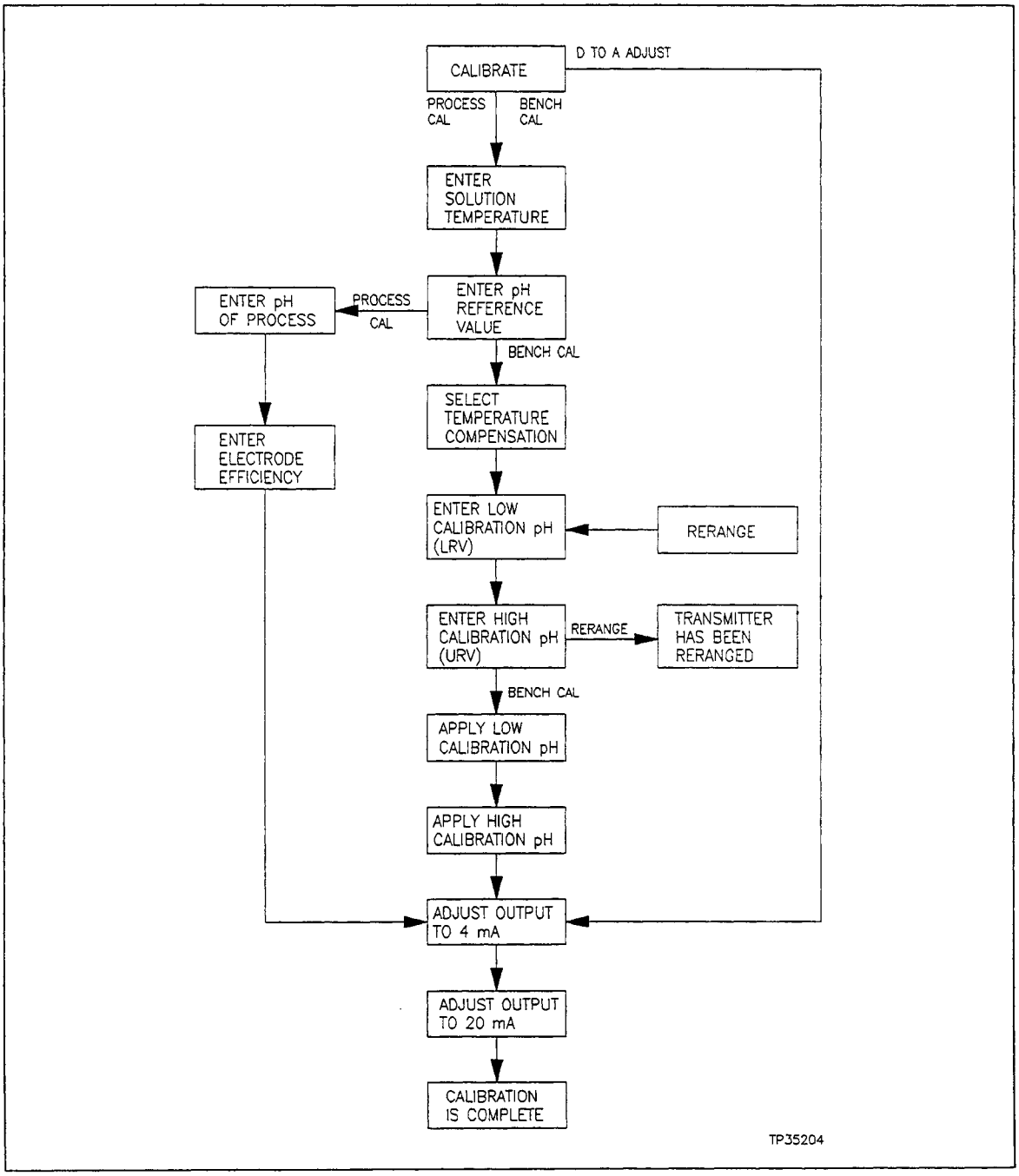


Figure F-2. Calibration Flow Chart (Type pH Smart Transmitter - pH Measurement)

APPENDIX G — TYPE pH SMART ELECTRONIC TRANSMITTER (ORP/SPECIFIC ION MEASUREMENT)

INTRODUCTION

The STT02 Smart Transmitter Terminal has an STT01 compatibility mode. To enter this mode select *BASEBAND*STT01*, at initial power-up.

NOTE: Adapter Cable, Bailey Kit No. 258445_1, is required for communication between baseband devices and STT02.

KEY	DISPLAY	COMMENTS
ON	BAILEY CONTROLS COMPANY REVISION X_X	
	COMMUNICATION FORMAT → FSK/BUS**STT02 BASEBAND*STT01	Choose *BASEBAND.*
↓	COMMUNICATION FORMAT FSK/BUS**STT02 → BASEBAND*STT01	
ENTER	USE CORD WITH JACK CONNECTOR	Cord connector attaches to the back of STT02. The jack of cord connector plugs into the receptacle of target device.
	SELECT DEVICE: → BC XMITTER TEMP. XMITTER ASI MASS FLOWMETER pH METER ORP/SPEC. ION VORTEX	Use ↓ cursor key to select *ORP/SPEC. ION.*

The STT02 Smart Transmitter Terminal allows the user to remotely calibrate, configure, troubleshoot, and monitor the Type PH Transmitter. The **Bench Calibration and Process Calibration** Procedures for ORP/specific ion measurement are also included in this Appendix.

Refer to Figure G-1 for a Configuration procedure flow chart. Refer to Figure G-2 for a flow chart of the Calibration procedure. (Note that the rerange procedure is included in the bench calibration procedure.)

Some things to note when using the STT02 with the Smart PH Meter for ORP/specific ion measurements are:

All measurements are made in units of mV; therefore, there is no units selection screen during calibration or configuration.

The keypad of the STT02 is slightly different than the STT01's. The **MANIFOLD**, **USER**, **F3** and **F4** function keys are not included on STT02 keypad. The **F1** and **F2** keys are present, but have no function when addressing the PH transmitter.

CONFIGURATION PROCEDURE (ORP/SPECIFIC ION)

The NEW function allows the user to input and save a complete configuration. The MODIFY function allows the user to change an existing configuration.

A configuration can be created without the STT02 being connected to a target device. A number of configurations can be entered and stored in the STT02 to be sent to a transmitter at a later time with the **SEND CONFIG** key.

NOTE: The STT02 is assumed to be in the READY state when beginning the following procedures.

KEY	DISPLAY	COMMENTS
CONFIG	CONFIGURATION → NEW MODIFY ERASE	Select *NEW*. **NOTE**: To modify an existing een sequence is the same, however, the MODIFY screens will appear with the values and cursor positions as they were originally configured.
ENTER	ENTER TAG ID: ^	The user enters a name for the configuration (Tag ID) using up to 12 ASCII characters. To select a character, scroll through the available list (refer to Table 4-3) using the ↑ and ↓ cursor keys. Use the → cursor key to move to the next digit. To change a character, use the ← cursor key to backspace.
ENTER	OUTPUT TYPE: → LINEAR FUNCTION GEN.	Select *LINEAR*. If *FUNCTION GEN.* is chosen as an output, five input and output points need to be entered as a percentage of input. The first and last points on the curve are assumed to 0.00% and 100.00%, the five points to be specified should be between these two values.
ENTER	OUTPUT ACTION: → NORMAL REVERSE	Move the indicator to your selection. (Refer to the applicable Product Instruction for an explanation of terms.)
ENTER	DAMPING : (0-32 SEC) XX.XX SEC	Enter a value from 0.00 to 32.00 seconds.

KEY	DISPLAY	COMMENTS
ENTER	LOWER RANGE VAL. X.XX mV UPPER RANGE VAL. X.XX mV	Input lower range value using the cursor keys, then press **ENTER**. Input the upper range value, then press **ENTER**.
ENTER	INITIALIZE MODE: → LOW HIGH	Make selection using cursor keys. Refer to the applicable Product Instruction for mode description.
ENTER	FAIL MODE : → LOW HIGH LAST	Make selection using cursor keys.
ENTER	SAVE CONFIG. NO ← YES	Make selection using cursor keys.
↓	SAVE CONFIG. NO YES ←	
ENTER	READY	Configuration is completed.

Located in the back of this manual are configuration worksheets for each device. If filled out, they provide the user with a hard copy of the configuration. Make several copies of the applicable worksheet for future use.

CALIBRATION PROCEDURES (ORP/SPECIFIC ION)

Bench Calibration Procedure

The **Bench Calibration** procedure for pH measurements with the Smart PH Meter is as follows:

KEY	DISPLAY	COMMENTS
CALI–BRATE	CALIBRATION: → D-TO-A ADJUST BENCH CALIB. PROCESS CAL.	Select *BENCH CALIB.*
↓	CALIBRATION: D-TO-A ADJUST → BENCH CALIB. PROCESS CAL.	
ENTER	ENTER SOLUTION TEMPERATURE XX.XX C	Enter solution temperature in °C using the number keypad. Default value is 25 °C.
ENTER	ENTER ISO POTENTIAL VALUE: XXX.XX mV	Enter ISO potential value using the number keypad. Limits are ±999. Default value is 0.
ENTER	SEL. TEMPERATURE COMPENSATION: → NONE NERNSTIAN	Make selection using cursor keys. (Refer to transmitter Product Instruction for an explanation of terms.)
ENTER	LOWER RANGE VAL. XXX.XX mV UPPER RANGE VAL. XXX.XX mV	Enter lower range value using the number keypad. Press **ENTER**. Enter upper range value in the same way.
ENTER	APPLY LOW CALIB SIGNAL THEN HIT ENTER	Apply lower range value to the input per transmitter calibration instructions.
ENTER	APPLY HIGH CALIB SIGNAL THEN HIT ENTER	Apply upper range value to the input per transmitter calibration instructions.

KEY	DISPLAY	COMMENTS
ENTER	WORKING	
	ADJUST TO 4mA THEN HIT ENTER	Adjust transmitter output using ↑ and ↓ cursor keys.
ENTER	ADJUST TO 20mA THEN HIT ENTER	Adjust transmitter output using ↑ and ↓ cursor keys.
ENTER	READY	Bench calibration is complete.

Process Calibration Procedure

The **Process Calibration** procedure for ORP/Specific Ion measurements with the Smart PH Meter is as follows:

KEY	DISPLAY	COMMENTS
CALI–BRATE	CALIBRATION: →D-TO-A ADJUST BENCH CALIB. PROCESS CAL.	Select *PROCESS CAL.*
↓	CALIBRATION: D-TO-A ADJUST → BENCH CALIB. PROCESS CAL.	
↓	CALIBRATION: D-TO-A ADJUST BENCH CALIB. → PROCESS CAL.	
ENTER	WORKING	
	ENTER SOLUTION TEMPERATURE XX.XX C	Enter solution temperature in °C using the number keypad. Default value is 25 °C.
ENTER	ENTER ISO POTENTIAL VALUE: XXX.XX mV	Enter ISO potential value using the number keypad. Limits are ±999. Default value is 0.
ENTER	SEL. TEMPERATURE COMPENSATION: → NONE NERNSTIAN	Make selection using the cursor keys. (Refer to transmitter Product Instruction for an explanation of terms.)
ENTER	ENTER mV OF PROCESS XXX.XX mV	Enter value using the number keypad. Default value is 0 mV.

KEY	DISPLAY	COMMENTS
ENTER	ENTER ELECTRODE EFFICIENCY: XXX.XX %	Enter value using the number keypad. Default value is 100%.
ENTER	WORKING	
	ADJUST TO 4mA THEN HIT ENTER	Adjust transmitter output using ↑ and ↓ cursor keys.
ENTER	ADJUST TO 20mA THEN HIT ENTER	Adjust transmitter output using ↑ and ↓ cursor keys.
ENTER	WORKING	
	READY	Process calibration is complete.

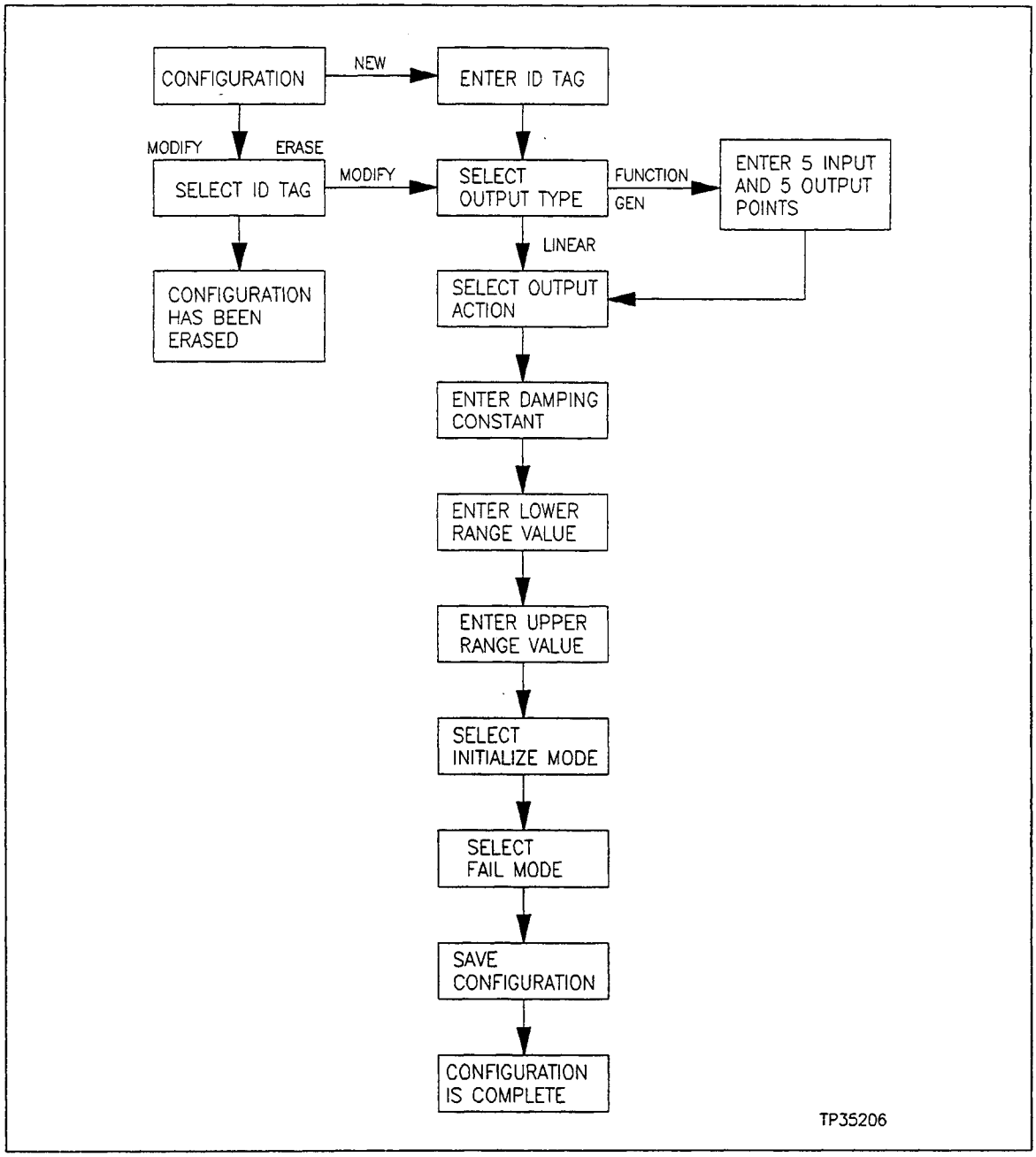


Figure G-1. Configuration Flow Chart - Type pH Smart Transmitter (ORP/Specific Ion Measurement)

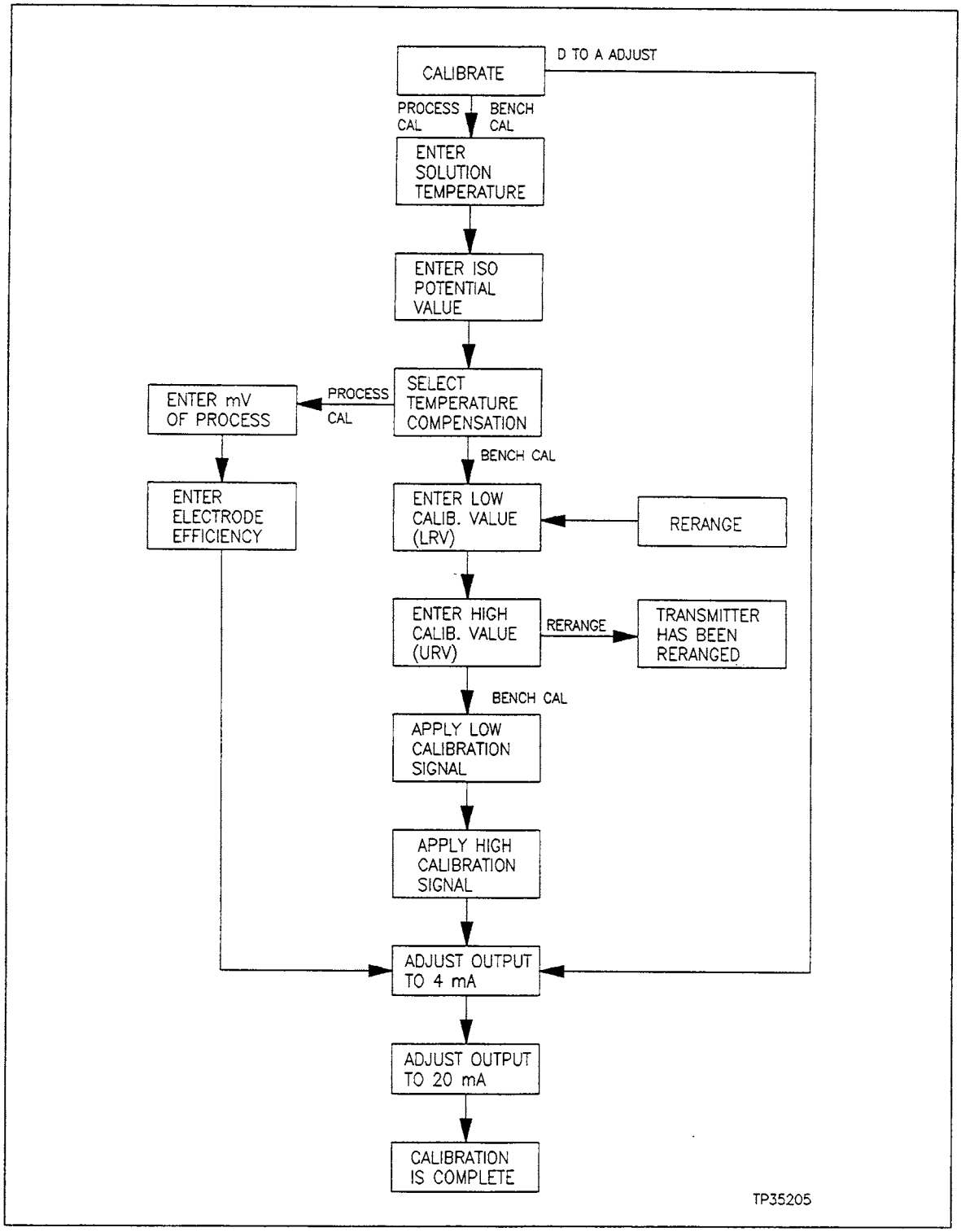


Figure G-2. Calibration Flow Chart - Type pH Smart Transmitter (ORP/Specific Ion Measurement)

APPENDIX H — TYPE DM DIRECT MASS FLOWMETER

INTRODUCTION

The STT02 Smart Transmitter Terminal has an STT01 compatibility mode. To enter this mode select *BASEBAND*STT01*, at initial power-up.

NOTE: Adapter Cable, Bailey Kit No. 258445_1, is required for communication between baseband devices and STT02.

KEY	DISPLAY	COMMENTS
ON	BAILEY CONTROLS COMPANY REVISION X_X	Choose *BASEBAND.*
	COMMUNICATION FORMAT → FSK/BUS**STT02 BASEBAND*STT01	
↓	COMMUNICATION FORMAT FSK/BUS**STT02 → BASEBAND*STT01	
ENTER	USE CORD WITH JACK CONNECTOR	Cord connector attaches to the back of STT02. The jack of cord connector plugs into the receptacle of target device.
	SELECT DEVICE: → BC XMITTER TEMP. XMITTER ASI MASS FLOWMETER pH METER ORP/SPEC. ION VORTEX	Use ↓ cursor key to select *MASS FLOWMETER.*

The STT02 Smart Transmitter Terminal allows the user to remotely zero, calibrate the outputs, configure, troubleshoot, and monitor the Type DM Direct Mass Flowmeter.

Refer to Figure H-1 for a Configuration Flowchart. Refer to Figure H-2 for a Calibration Procedure Flowchart. Refer to Figure H-3 for a Rerange Procedure Flowchart.

NOTE: There is not a bench calibration procedure for the DM Mass Flowmeter. The only calibration functions applicable to the DM Mass Flowmeter are RERANGE, D-TO-A ADJUSTMENT, and REZERO.

Some things to note when the STT02 is being used with the Type DM Direct Mass Flowmeter:

The mass flow engineering units are selected on two consecutive screens during the configuration procedure:

```
SELECT ENT.UNITS
→ LBS
  KG
```

Make selection using the ↑ and ↓ cursor keys. Then press **ENTER**. The following screen will be displayed:

```
SELECT ENG.UNITS
→ /HR
  /MIN
  /SEC
```

Make selection using the ↑ and ↓ cursor keys. Then press **ENTER**.

NOTES:

1. Changing engineering units will automatically convert the upper and lower range values to this new unit. However, if the converted upper and lower range values would be greater than 9999 or less than -9999, the transmitter would not accept this command and the communications error message will result.

2. Engineering units for density are always g/cc, therefore there is no selection screen for density engineering units.

The keypad of the STT02 is slightly different than the STT01's. The **MANIFOLD, USER, F3** and **F4** function keys are not included on STT02 keypad. The **F1** and **F2** keys are present, but have no function when addressing the Mass Flowmeter.

CONFIGURATION PROCEDURE

1. The Output Type selection screen is not displayed.

2. Two screens (one for mass flow and one for density) will be displayed for Output Action, Damping Constant, and Upper and Lower Range Values.

3. Three additional screens allow the user to select units, rate, and threshold value for the frequency output.

The **NEW CONFIGURATION** procedure for the Type DM Direct Mass Flowmeter is as follows:

KEY	DISPLAY	COMMENTS
CONFIG	CONFIGURATION: →NEW MODIFY ERASE	Select *NEW*.
ENTER	ENTER TAG ID: ^	The Tag ID is a 12 digit combination of ASCII symbols. To enter a digit, scroll through the available characters (Table 4-3) using the ↑ and ↓ cursor keys. Use the → key to move to the next digit. To change a digit, use the ← key to go back to it. A carrot (^) will be below the digit at the cursor location.
ENTER	MASSFLOW OUTPUT: → NORMAL REVERSE	Make selection using cursor keys.
ENTER	DENSITY OUTPUT: → NORMAL REVERSE	Make selection using cursor keys.
ENTER	MASS FL DAMPING: (0-60 SEC) XX.XX SEC	Enter a value from 0.00 to 60.00 seconds.

KEY	DISPLAY	COMMENTS
ENTER	DENSITY DAMPING: (0-60 SEC) XX.XX SEC	Enter a value from 0.00 to 60.00 seconds.
ENTER	SELECT ENG. UNITS → LBS KG	Make selection using cursor keys.
ENTER	SELECT ENG. UNITS → /HR /MIN /SEC	Make selection using cursor keys.
ENTER	MFL. LOWER RANGE XXX.X UNITS MFL. UPPER RANGE XXX.X UNITS	Input the desired Lower Range Value using the number keypad; press **ENTER**. Input the desired Upper Range Value using the number keypad. **NOTE:** The engineering units displayed are those selected in the previous step.
ENTER	DEN. LOWER RANGE X.XXX g/cc DEN. UPPER RANGE X.XXX g/cc	Input the desired Lower Range Value (≤ four digits) using the number keypad; press **ENTER**. Input the desired Upper Range Value (≤ four digits) using the number keypad.
ENTER	MASS FL:FREQ OUT → LBS/PULSE KG/PULSE	Make selection using the cursor keys.
ENTER	MASS FL:FREQ OUT SELECT UNITS → .001 .01 .1 1 10 100	Make selection using the cursor keys (refer to Product Instruction, I-E22-37, for an explanation).
ENTER	MASS FL:FREQ OUT (% of SPAN:) THRESHOLD:XX.X%	Input a value (≤ three digits) for the threshold using the number keypad. Limits are: 0 to 10%. A command line error will result if a value outside of these limits is entered.

KEY	DISPLAY	COMMENTS
ENTER	INIT.MODE. DEN. → LOW HIGH	Make selection using the cursor keys.
ENTER	FAIL MODE. DEN. → LOW LAST HIGH	Make selection using the cursor keys.
ENTER	INITIALIZE MODE: → LOW HIGH	Make selection using the cursor keys. **NOTE:** This screen is for mass flow output.
ENTER	FAIL MODE: → LOW LAST HIGH	Make selection using the cursor keys. **NOTE:** This screen is for mass flow output.
ENTER	SAVE CONFIG. NO ← YES	Make selection using the cursor keys.
ENTER	READY	

Located in the back of this manual are configuration worksheets for each device. If filled out, they provide the user with a hard copy of the configuration. Make several copies of the applicable worksheet for future use.

CALIBRATION PROCEDURE

When the **CALIBRATE** key is pressed, the following menu is displayed:

```
SELECT METER:
→ MASS FLOW
  DENSITY
```

NOTE: If *DENSITY* is selected as the METER TYPE (using the ↓ cursor key) a D-TO-A adjustment is the only applicable calibration procedure. A CALIBRATION MENU is not displayed. The user should continue with the D-TO-A ADJUSTMENT procedure as outlined in **OPERATING PROCEDURES**.

Press **ENTER** to choose *MASS FLOW*. The following screen will be displayed:

```
CALIBRATION:
→ D-TO-A ADJUST
  REZERO
```

Press **ENTER** to select *D-TO-A ADJUST*. Continue with the procedure as outlined in **OPERATING PROCEDURES.**

If *REZERO* is desired, continue with the following procedure:

NOTE: Be sure to read and fully understand the **CALIBRATION** Section of Product Instruction I-E22-37 before attempting the **Rezero** procedure.

KEY	DISPLAY	COMMENTS
ENTER	CALIBRATION: → D-TO-A ADJUST REZERO	Select *REZERO.*
↓	CALIBRATION: D-TO-A ADJUST → REZERO	

KEY	DISPLAY	COMMENTS
ENTER	MASS FLOW MUST BE ZERO !	Be sure there is no flow through the transducer.
	PROCEED ? NO ← YES	To select *NO* press **ENTER.** Display will return to the READY condition. Select *YES* using the ↓ cursor key.
↓	PROCEED ? NO YES ←	
ENTER	WORKING	
	ZERO FLOW IN PROGRESS	
	READY	Flowmeter has been zeroed.

When monitoring the input or output of the Mass Flowmeter (using the **OUTPUT** key) the STT02 display follows the transmitter display.

Error codes (E1 through E14) are displayed, if applicable, on the STT02.

When doing a STATUS check with the STT02, error messages (if any) are reported in order of highest priority. E0 is highest priority, followed by E1 through E14. OVR (Overrange) and UNR (Underrange) are lowest priority. Refer to Product Instruction I-E22-37 for corrective action as needed.

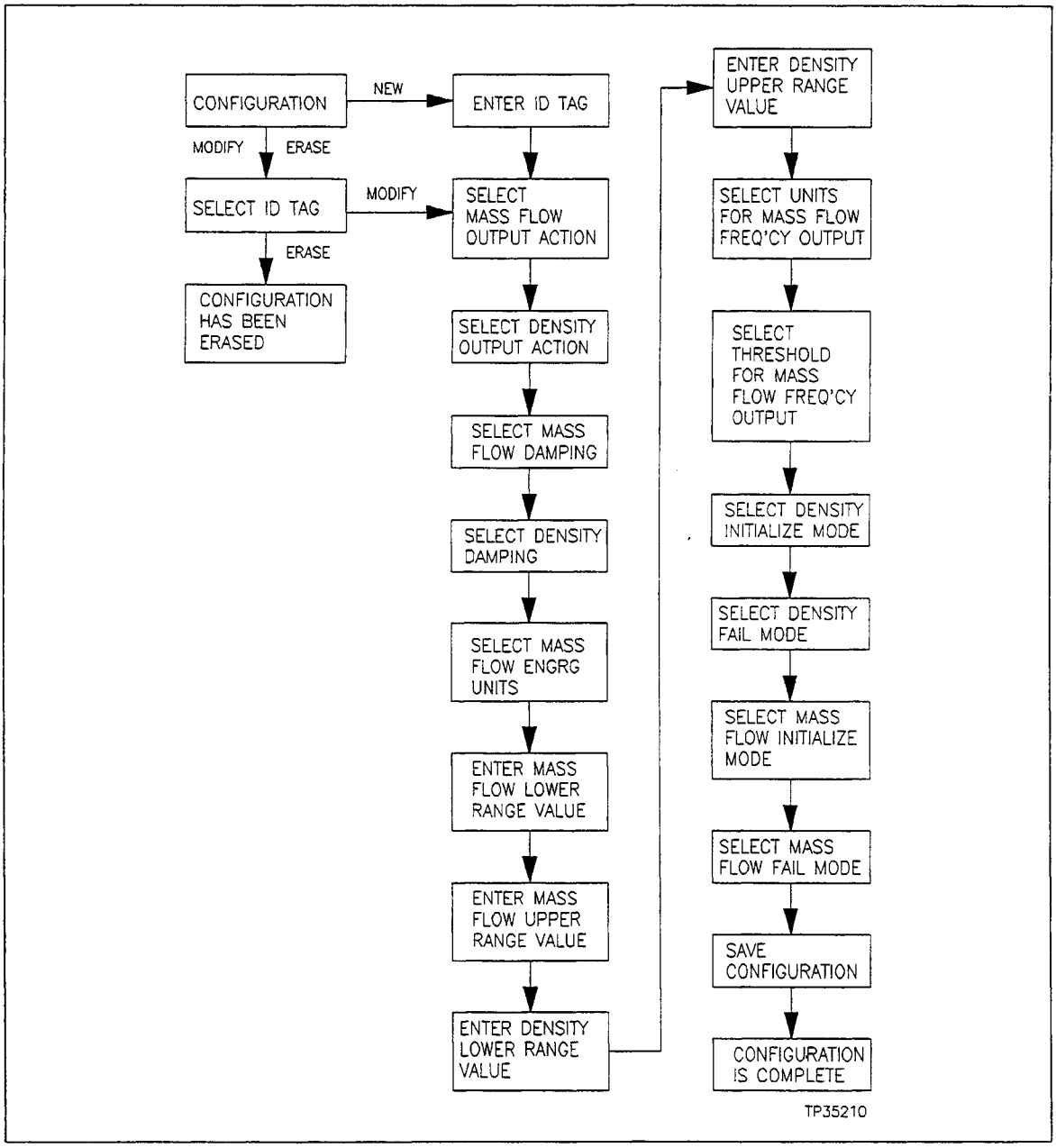


Figure H-1. Configuration Flowchart (Type DM Direct Mass Flowmeter)

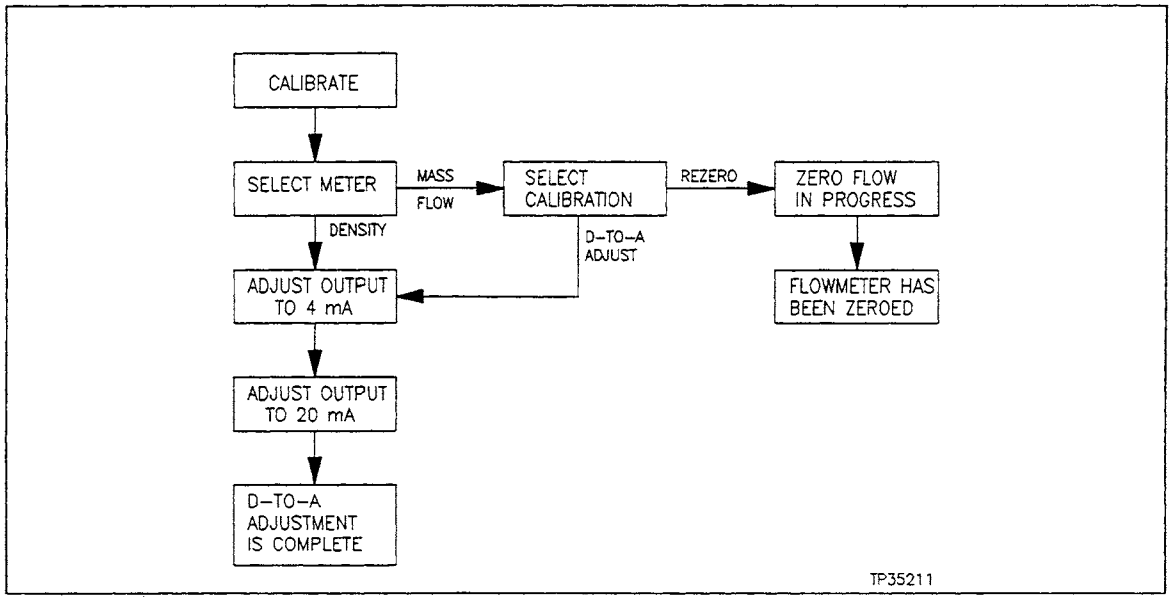


Figure H-2. Calibration Flowchart (Type DM Direct Mass Flowmeter)

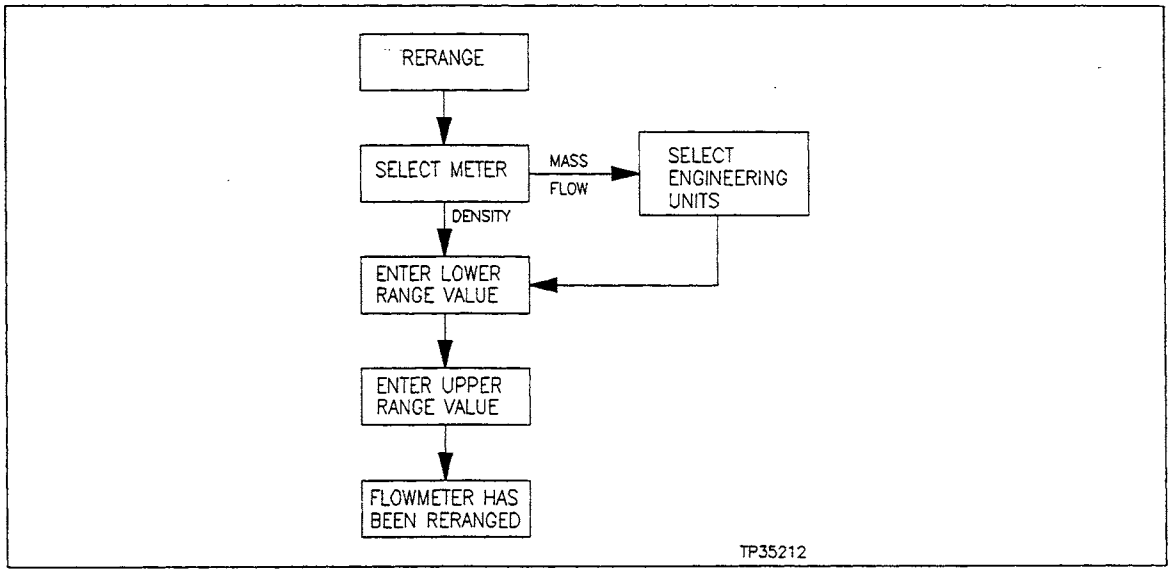


Figure H-3. Rerange Procedure Flowchart (Type DM Direct Mass Flowmeter)

Configuration Worksheet	**Type BCN Smart Electronic Pressure Transmitter**

(≤12 digits, alpha-numeric)	(Analog/Digital)
ID Tag:	**Selection Mode:**

Output Type:

Linear[1] ☐ Square Root ☐ 3/2 Flow Mode ☐

5/2 Flow Mode ☐ Vol./Sphere ☐ Vol./Cylinder ☐

Function Generator (Indicate input/output) ☐:

Point 1 INPUT	_____ %	Point 1 OUTPUT	_____ %
Point 2 INPUT	_____ %	Point 2 OUTPUT	_____ %
Point 3 INPUT	_____ %	Point 3 OUTPUT	_____ %
Point 4 INPUT	_____ %	Point 4 OUTPUT	_____ %
Point 5 INPUT	_____ %	Point 5 OUTPUT	_____ %

Output Action: Normal[1] ☐ Reverse ☐

Damping: _____ sec. (0.00[1] to 32.00 sec.)

Engineering Units:

iH2O[1] ☐ mmHG ☐ cmH20 ☐

PSI ☐ MPA ☐ KPA ☐

BARS ☐ mBAR ☐ kgcm2 ☐

Lower Range Value: Specified LRV: _____

Upper Range Value: Specified URV: _____

Initialize Mode[2]: Low _____ High _____

Fail Mode[2]: Low _____ High _____ Last _____

Secondary Units: _____ **Secondary LRV:** _____ **Secondary URV:** _____

1. Default parameters.
2. Select to maintain safe operation during start-up and diagnostically detected failure of the BCN Transmitter.

Bailey®

Configuration Worksheet	**Type EQN Smart Electronic Temperature Transmitter**

(≤12 digits,alpha-numeric)

ID Tag:

Transmitter Mode: Thermocouple ☐ RTD ☐ Millivolt ☐

Thermocouple: N ☐ B ☐ E ☐ J ☐ K ☐ R ☐ S ☐ T ☐ C ☐

RTD: 2-Wire ☐ 3-Wire ☐ Dual ☐

RTD Type: 100 ohms (Pt 385) ☐ 100 ohms (Pt 392) ☐ ohms mode ☐

Approximate Method (Thermocouple only): Linear ☐ Non-Linear ☐

Function Generator: YES ☐ NO ☐

Point 1 INPUT	_____ %	Point 1 OUTPUT	_____ %
Point 2 INPUT	_____ %	Point 2 OUTPUT	_____ %
Point 3 INPUT	_____ %	Point 3 OUTPUT	_____ %
Point 4 INPUT	_____ %	Point 4 OUTPUT	_____ %
Point 5 INPUT	_____ %	Point 5 OUTPUT	_____ %

Output Action: Normal[1] ☐ Reverse ☐

Damping: _____ sec. (0.00[1] to 32.00 sec.)

Engineering Units[2]: Celsius ☐ Fahrenheit ☐ Kelvin ☐

Lower Range Value: Specified LRV: _____

(< specified URV) LRV: _____

Upper Range Value: Specified URV: _____

(> specified LRV) URV: _____

Initialize Mode[3]: Low[1] _____ High _____

Fail Mode[3]: Low[1] _____ High _____ Last _____

1. Default parameters.
2. Not applicable to Millivolt Mode.
3. Select to maintain safe operation during start-up and diagnostically detected failure of the Transmitter.

Bailey®

Configuration Worksheet	**Type BC Smart Electronic Pressure Transmitter**

(≤12 digits, alpha-numeric)

ID Tag:

Output Type: Linear[1] ☐ Square Root ☐

Function Generator (Indicate input/output) ☐:

Point 1 INPUT	_____ %	Point 1 OUTPUT	_____ %
Point 2 INPUT	_____ %	Point 2 OUTPUT	_____ %
Point 3 INPUT	_____ %	Point 3 OUTPUT	_____ %
Point 4 INPUT	_____ %	Point 4 OUTPUT	_____ %
Point 5 INPUT	_____ %	Point 5 OUTPUT	_____ %

Output Action: Normal[1] ☐

Reverse ☐

Damping: _____ sec. (0.00[1] to 32.00 sec.)

Engineering Units: iH2O[1] ☐ KPA ☐ PSI ☐ BAR ☐

mBAR ☐ mmHG ☐ MPA ☐ mmH2 ☐

Lower Range Value: Specified LRV: _____

(≥ specified LRV) LRV: _____ (0.00 IH20[1])

Upper Range Value: Specified URV: _____

(≤ specified URV) URV: _____ (200 IH20[1])

Initialize Mode[2]: Low[1] _____

High _____

Fail Mode[2]: Low[1] _____

High _____

Last _____

1. Default parameters.
2. Select to maintain safe operation during start-up and diagnostically detected failure of the BC Transmitter.

Bailey®

Configuration Worksheet	**Type EQ Smart Electronic Temperature Transmitter**

(≤12 digits,alpha-numeric)

ID Tag:

Transmitter Mode: Thermocouple ☐ RTD ☐ Millivolt ☐

Thermocouple: B ☐ E ☐ R ☐ C ☐ J ☐ S ☐ D ☐ K ☐ T ☐

RTD: Single ☐ Dual ☐

Output Type: Linear[1] ☐

Function Generator (Indicate input/output): ☐

Point 1 INPUT _____ %	Point 1 OUTPUT _____ %
Point 2 INPUT _____ %	Point 2 OUTPUT _____ %
Point 3 INPUT _____ %	Point 3 OUTPUT _____ %
Point 4 INPUT _____ %	Point 4 OUTPUT _____ %
Point 5 INPUT _____ %	Point 5 OUTPUT _____ %

Output Action: Normal[1] ☐ Reverse ☐

Damping: _____ sec. (0.00[1] to 32.00 sec.)

Engineering Units[2]: Celsius ☐ Fahrenheit ☐ Kelvin ☐

Lower Range Value: Specified LRV: _____

(≥ specified LRV) LRV: _____

Upper Range Value: Specified URV: _____

(≤ specified URV) URV: _____

Initialize Mode[3]: Low[1] _____ High _____

Fail Mode[3]: Low[1] _____ High _____ Last _____

1. Default parameters.
2. Not applicable to Millivolt Mode.
3. Select to maintain safe operation during start-up and diagnostically detected failure of the Transmitter.

Bailey®

Configuration Worksheet	**Type pH Smart Electronic Transmitter – pH Measurement**

(≤12 digits,alpha-numeric)

ID Tag:

Output Type: Linear[1] ☐

Function Generator (Indicate input/output): ☐

Point 1 INPUT _____ %	Point 1 OUTPUT _____ %
Point 2 INPUT _____ %	Point 2 OUTPUT _____ %
Point 3 INPUT _____ %	Point 3 OUTPUT _____ %
Point 4 INPUT _____ %	Point 4 OUTPUT _____ %
Point 5 INPUT _____ %	Point 5 OUTPUT _____ %

Output Action: Normal[1] ☐

Reverse ☐

Damping: _____ sec. (0.00[1] to 32.00 sec.)

Lower Range Value: Specified LRV: _____

(≥ specified LRV) LRV: _____ (0.00 pH[1])

Upper Range Value: Specified URV: _____

(≤ specified URV) URV: _____ (14.00 pH[1])

Initialize Mode[2]: Low[1] _____

High _____

Fail Mode[2]: Low[1] _____

Last _____

High _____

1. Default parameters.
2. Select to maintain safe operation during start-up and diagnostically detected failure of the Transmitter.

Bailey®

Configuration Worksheet	**Type pH Smart Electronic Transmitter ORP/Specific ION Measurement**

(≤12 digits,alpha-numeric)

ID Tag:

Output Type: Linear[1] ☐

Function Generator (Indicate input/output): ☐

Point 1 INPUT _____ %	Point 1 OUTPUT _____ %
Point 2 INPUT _____ %	Point 2 OUTPUT _____ %
Point 3 INPUT _____ %	Point 3 OUTPUT _____ %
Point 4 INPUT _____ %	Point 4 OUTPUT _____ %
Point 5 INPUT _____ %	Point 5 OUTPUT _____ %

Output Action: Normal[1] ☐

Reverse ☐

Damping: _____ sec. (0.00[1] to 32.00 sec.)

Lower Range Value: Specified LRV: _____

(≥ specified LRV) LRV: _____ (0.00 pH[1])

Upper Range Value: Specified URV: _____

(≤ specified URV) URV: _____ (14.00 pH[1])

Initialize Mode[2]: Low[1] _____

High _____

Fail Mode[2]: Low[1] _____

Last _____

High _____

1. Default parameters.
2. Select to maintain safe operation during start-up and diagnostically detected failure of the Transmitter.

Bailey®

Configuration Worksheet	**Type DM Direct Mass Flowmeter**

(≤12 digits, alpha-numeric)

ID Tag:

Output Action:	Density:	Normal[1] ☐		Reverse ☐	
	Mass Flow:	Normal[1] ☐		Reverse ☐	
Damping:	Density:	_____ sec.	(1.00 sec.[1])		
(0.00[1] to 60.00 sec.)	Mass Flow:	_____ sec.	(1.00 sec.[1])		
Mass Flow Units[3]:	Lb/Min ☐		Kg/Min ☐		
	Lb/Sec ☐		Kg/Sec ☐		
	Lb/Hr ☐		Kg/Hr ☐		
Lower Range Value:	Density:	Specified LRV: _____		LRV: _____	
(≥ specified LRV)	Mass Flow:	Specified LRV: _____		LRV: _____	
Upper Range Value:	Density:	Specified URV: _____		URV: _____	
(≤ specified URV)	Mass Flow:	Specified URV: _____		URV: _____	
Frequency Output:	Select Units:	Lbs/Pulse ☐		Kg/Pulse ☐	
	Select Units:	.001 ☐	.01 ☐	.1 ☐	
		1 ☐	10 ☐	100 ☐	
	Threshold:	_____ %	(0 - 10%)		
Initialize Mode[2]:	Density:	Low[1] _____		High _____	
	Mass Flow:	Low[1] _____		High _____	
Fail Mode[2]:	Density:	Low[1] _____		High _____	Last _____
	Mass Flow:	Low[1] _____		High _____	Last _____

1. Default parameters.
2. Select to maintain safe operation during start-up and diagnostically detected failure of the Mass Flowmeter.
3. Units for Density are g/cc.

Bailey®

Form I-E21-28A Litho

ABB Automation Inc.
125 East County Line Road
Warminster, PA 18974 USA
Tel. 215-674-6000
FAX: 215-674-7183

ABB Instrumentation Ltd
Howard Road, St. Neots
Cambs. England, PE19 3EU
Tel. +44 (0) 1480-475-321
FAX: +44 (0) 1480-217-948

ABB Instrumentation S.p.A
Via Sempione 243
20016 Pero (Milano) Italy
Tel: +39 (02) 33928 1
Fax: +39 (02) 33928 240

ABB Automation Products GmbH
Industriestr. 28
D-65760 Eschborn Germany
Tel: +49 (0) 6196 800 0
Fax: +49 (0) 6196 800 1849