Reference Manual
00809-0100-4377, Rev AA
July 2003

Rosemount 752 Remote Indicator

with FOUNDATION™ Fieldbus protocol

FOUNDATION

ROSEMOUNT®

www.rosemount.com

EMERSON™
Process Management

Reference Manual
00809-0100-4377, Rev AA
July 2003

Rosemount 752 Remote Indicator with FOUNDATION™ Fieldbus Protocol

NOTICE

Read this manual before working with the product. For personal and system safety, and for optimum product performance, make sure you thoroughly understand the contents before installing, using, or maintaining this product.

Within the United States, Rosemount Inc. has two toll-free assistance numbers:

Customer Central
Technical support, quoting, and order-related questions.

1-800-999-9307 (7:00 am to 7:00 pm CST)

North American Response Center
Equipment service needs.

1-800-654-7768 (24 hours—includes Canada)

Outside of the United States, contact your local Rosemount® representative.

⚠CAUTION

The products described in this document are NOT designed for nuclear-qualified applications. Using non-nuclear qualified products in applications that require nuclear-qualified hardware or products may cause inaccurate readings.

For information on Rosemount nuclear-qualified products, contact your local Rosemount Sales Representative.

Table of Contents

Section 1 Introduction

OVERVIEW

This manual was developed with the assumption that the user will have a basic understanding of FOUNDATION Fieldbus concepts and wiring practices.

Information is available at www.plantweb.emersonprocess.com/university or check with your system integrator about resources for your specific host system.

USING THIS MANUAL

The sections in this manual provide information on configuring, troubleshooting, operating and maintaining the Rosemount 752 Remote Indicator with FOUNDATION fieldbus protocol.

The sections in this manual are organized as follows:

- **Section 2: Configuration** provides instruction on configuration of the Rosemount 752 Remote Indicator with FOUNDATION fieldbus protocol. Information on software functions, configuration parameters, and other variables are also included.
- **Section 3: Operation and Maintenance** contains operation and maintenance techniques.
- **Section 4: Troubleshooting** provides troubleshooting techniques for the most common operating problems.
- **Appendix A: Reference Information** supplies reference and specification data, as well as ordering information.
- **Appendix B: Product Certificates** contains intrinsic safety approval information, European ATEX directive information, and approval.
- **Appendix C: Block Information** supplies reference block information such as parameter tables.

Service Support

To expedite the return process outside of the United States, contact the nearest Rosemount representative.

Within the United States, call the Rosemount National Response Center using the 1-800-654-RSMT (7768) toll-free number. This center, available 24 hours a day, will assist you with any needed information or materials.

The center will ask for product model and serial numbers, and will provide a Return Material Authorization (RMA) number. The center will also ask for the process material to which the product was last exposed.

⚠CAUTION

Individuals who handle products exposed to a hazardous substance can avoid injury if they are informed of and understand the hazard. If the product being returned was exposed to a hazardous substance as defined by OSHA, a copy of the required Material Safety Data Sheet (MSDS) for each hazardous substance identified must be included with the returned goods.

Rosemount National Response Center representatives will explain the additional information and procedures necessary to return goods exposed to hazardous substances.

DEVICE DESCRIPTION

Before configuring the device, ensure the host has the appropriate Device Description file revision for this device. The device descriptor can be found on www.rosemount.com.

NODE ADDRESS

The indicator is shipped at a temporary (248) address. This will enable FOUNDATION fieldbus host systems to automatically recognize the device and move it to a permanent address.

FOUNDATION FIELDBUS FUNCTION BLOCKS

For reference information on the LCD Transducer and Advanced Diagnostics Transducer blocks refer to “Foundation Fieldbus Block Information” on page A-1. Reference information on the ISEL, INT, ARTH, SGCR and PID blocks can be found in the Function Block manual document number 00809-0100-4783.

Resource Block (1000)

The Resource block contains diagnostic, hardware and electronics information. There are no linkable inputs or outputs to the Resource Block.

LCD Transducer Block (1100)

The LCD Transducer Block is used to configure the LCD meter.

PID Block (1200)

The PID Function Block combines all of the necessary logic to perform proportional/integral/derivative (PID) control. The block supports mode control, signal scaling and limiting, feed forward control, override tracking, alarm limit detection, and signal status propagation.

The block supports two forms of the PID equation: Standard and Series. You can choose the appropriate equation using the MATHFORM parameter. The Standard ISA PID equation is the default selection.

Input Selector Block (1300)

The Input Selector (ISEL) Function Block can be used to select the first good, Hot Backup, maximum, minimum, or average of as many as eight input values and place it at the output. The block supports signal status propagation.

Signal Characterizer Block (1400)

The Signal Characterizer (SGCR) Function Block characterizes or approximates any function that defines an input/output relationship. The function is defined by configuring as many as twenty X,Y coordinates. The block interpolates an output value for a given input value using the curve defined by the configured coordinates. Two separate analog input signals can be processed simultaneously to give two corresponding separate output values using the same defined curve.

Arithmetic Block (1500)

The Arithmetic (ARTH) Function Block provides the ability to configure a range extension function for a primary input. It can also be used to compute nine different arithmetic functions.

Integrator Block (1600)

The Integrator (INT) Function Block integrates one or two variables over time. The block compares the integrated or accumulated value to pre-trip and trip limits and generates discrete output signals when the limits are reached.

Section 2 Configuration

OVERVIEW

This section covers basic operation, software functionality, and basic configuration procedures for the Rosemount 752 Remote Indicator with FOUNDATION fieldbus protocol. This section is organized by block information. For detailed information about the function blocks used in the Rosemount 752 Remote Indicator, refer to “Block Information” on page C-1 and the Foundation fieldbus Block manual (00809-0100-4783).

SAFETY MESSAGES

Procedures and instructions in this section may require special precautions to ensure the safety of the personnel performing the operations. Information that raises potential safety issues is indicated by a warning symbol (⚠). Refer to the following safety messages before performing an operation preceded by this symbol.

Warnings

⚠WARNING

Explosions can result in death or serious injury.

- Do not remove the indicator covers in explosive environments when the circuit is live.
- Indicator covers must be fully engaged to meet explosion proof requirements.
- Before connecting a configuration tool in an explosive atmosphere, make sure the instruments in the loop are installed in accordance with intrinsically safe or nonincendive field wiring practices.

⚠WARNING

Electrical shock can result in death or serious injury.

- Avoid contact with the leads and terminals. High voltage that may be present on leads can cause electrical shock.

INSTALLATION OF THE ROSEMOUNT 752

Set Switches

Security (Write Protect)

Changes can be prevented to the indicator configuration data with the write protection PlantWeb housing switches. Security is controlled by the security (write protect) switch/jumper located on the interface assembly or terminal block. Position the switch/jumper in the “ON” position to prevent accidental or deliberate change of configuration data.

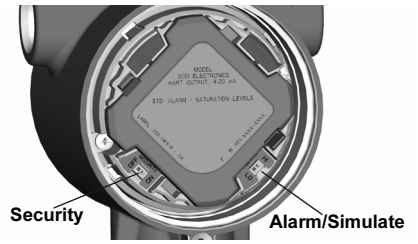
If the indicator write protection switch/jumper is in the “ON” position, the indicator will not accept any “writes” to its memory. Configuration changes cannot take place when the indicator security is on.

To reposition the switches/jumpers, follow the procedure described below. (Simulate = fieldbus protocol)

1. Set the loop to manual and remove power.
2. ⚠ Remove the electronics compartment cover, opposite the field terminal side on the PlantWeb housing. Do not remove the indicator covers in explosive atmospheres when the circuit is live.
3. Slide the security and simulate switches into the preferred position by using a small screwdriver.

⚠ Re-install the indicator cover. Indicator covers must be fully engaged to meet explosion-proof requirements.

Figure 2-1. PlantWeb Housing Switches



Connect Wiring and Power Up

Wiring for fieldbus protocol

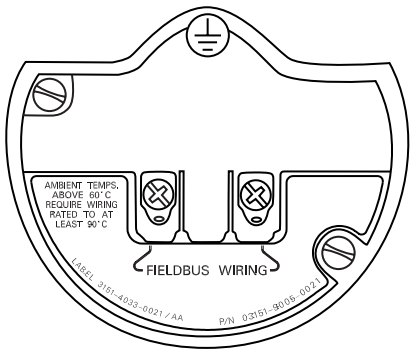
⚠ 1. Remove the housing cover on terminal compartment side. Do not remove the cover in explosive atmospheres when the circuit is live. Signal wiring supplies all power to the indicator.

⚠ 2. Connect the power leads to the terminals marked “FIELDBUS WIRING” as shown in Figure 2-2. The power terminals are not polarity sensitive.

3. Plug and seal unused conduit connections on the indicator housing to avoid moisture accumulation in the terminal side. If you do not seal unused connections, mount the indicator with the electrical housing positioned downward for drainage. Install wiring with a drip loop. Arrange the drip loop so the bottom is lower than the conduit connections and the indicator housing.

NOTE
Do not apply high voltage (e.g. ac line voltage) to the indicator terminals. Abnormally high voltage can damage the unit. (Indicator poser terminals are rated to 32 V dc).

Figure 2-2. Fieldbus terminal block



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Electrical Considerations

Proper electrical installation is necessary to prevent errors due to improper grounding and electrical noise. Shielded, twisted pair cable should be used for best results in electrically noisy environments. Cable Type A is recommended by FOUNDATION® fieldbus.

Power Supply

The indicator requires between 9 and 32 V dc (9 and 15 V dc for FISCO) to operate and provide complete functionality. The dc power supply should provide power with less than 2% ripple.

Power Conditioner

A fieldbus segment requires a power conditioner to isolate the power supply filter and decouple the segment from other segments attached to the same power supply.

Grounding

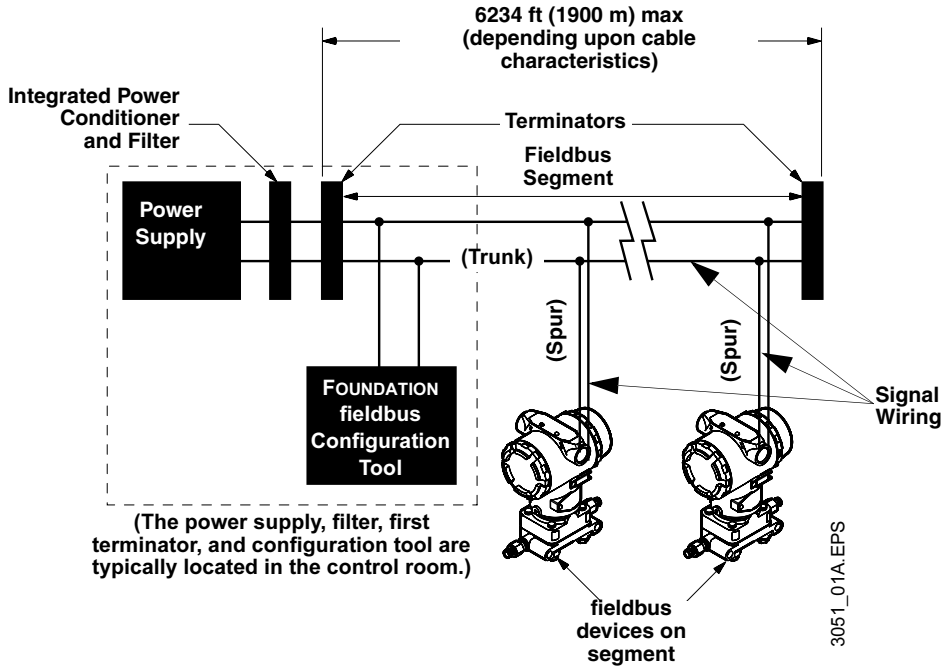
Signal wiring of the fieldbus segment can not be grounded. Grounding out one of the signal wires will shut down the entire fieldbus segment.

⚠ See “Safety Messages” on page 2-1 for complete warning information.

Shield Wire Ground

To protect the fieldbus segment from noise, grounding techniques for shield wire usually require a single grounding point for shield wire to avoid creating a ground loop. The ground point is typically at the power supply.

Figure 2-3. Fieldbus indicator field wiring



***Intrinsically safe installations may allow fewer devices per I.S. barrier due to current limitations.**

Surges/Transients

The indicator will withstand electrical transients of the energy level usually encountered in static discharges or induced switching transients. However, high-energy transients, such as those induced in wiring from nearby lightning strikes, can damage the indicator.

Optional Transient Protection Terminal Block

The transient protection terminal block can be ordered as an installed option (Option Code T1 in the indicator model number) or as a spare part. The spare part number is 03151-4134-0002. The lightning bolt symbol shown identifies it as a transient protection terminal block.

NOTE

The fieldbus physical layer specification requires indicator communication during extreme operating conditions of 250 V_{rms} common mode signal. The transient terminal block was designed to limit common mode voltages to 90 V and cannot be used in these extreme operating conditions.

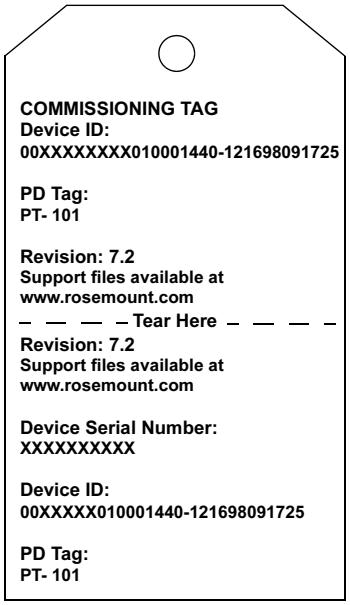
GENERAL CONSIDERATIONS

Tagging

Commissioning (Paper) Tag on a fieldbus segment

When commissioning more than one device on a fieldbus segment, it can be difficult to identify which device is at a particular location. A removable tag provided with the indicator can aid in this process by linking the Device ID and a physical location. The Device ID is a unique code that identifies a particular device in the absence of a device tag. The device tag is used by the customer as an operational identification for the device and is usually defined by the Piping and Instrumentation Diagram (P & ID).

The installer should note the physical location in both places on the removable commissioning tag and tear off the bottom portion. This should be done for each device on the segment. The bottom portion of the tags can be used for commissioning the segment in the control system, providing a direct link between the Device ID and the tag location.



HAZARDOUS LOCATIONS

The 752 Remote Indicator has explosion-proof housing and circuitry suitable for intrinsically safe and non-incendive operation. Individual indicators are clearly marked with a tag indicating the certifications they carry. See Appendix B: Approval Information for installation drawings.

NOTE
Once a device labeled with multiple approvals is installed, it should not be reinstalled using any other approval type(s). Permanently mark the certification label to distinguish the installed approval type from unused approval types.

Grounding the Indicator Case

Always ground the indicator case in accordance with national and local electrical codes. The most effective indicator case grounding method is a direct connection to earth ground with minimal impedance. Methods for grounding the indicator case include:

- **Internal Ground Connection**: The Internal Ground Connection screw is inside the terminal side of the electronics housing. The screw is identified by a ground symbol (⏚), and is standard on the 752 Remote Indicators.
- **External Ground Assembly**: Ground screw is located at the bottom of the mounting bracket.

NOTE
Grounding the indicator case using the threaded conduit connection may not provide a sufficient ground. The transient protection terminal block (Option Code T1) will not provide transient protection unless the indicator case is properly grounded. Use the above guidelines to ground the indicator case. Do not run transient protection ground wire with signal wiring; the ground wire may carry excessive current if a lightning strike occurs.

GENERAL BLOCK INFORMATION

Modes

The Resource, Transducer, and all function blocks in the device have modes of operation. These modes govern the operation of the block. Every block supports both automatic (AUTO) and out of service (OOS) modes. Other modes may also be supported.

⚠ Changing Modes

To change the operating mode, set the MODE_BLK.TARGET to the desired mode. After a short delay, the parameter MODE_BLOCK.ACTUAL should reflect the mode change if the block is operating properly.

Permitted Modes

It is possible to prevent unauthorized changes to the operating mode of a block. To do this, configure MODE_BLOCK.PERMITTED to allow only the desired operating modes. It is recommended to always select OOS as one of the permitted modes.

Types of Modes

For the procedures described in this manual, it will be helpful to understand the following modes:

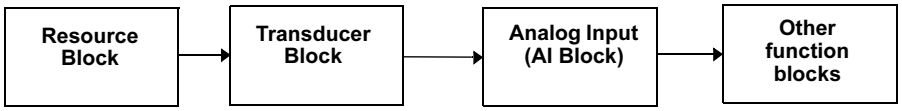
AUTO
The functions performed by the block will execute. If the block has any outputs, these will continue to update. This is typically the normal operating mode.

Out of Service (OOS)
The functions performed by the block will not execute. If the block has any outputs, these will typically not update and the status of any values passed to downstream blocks will be “BAD”. To make some changes to the configuration of the block, change the mode of the block to OOS. When the changes are complete, change the mode back to AUTO.

MAN
In this mode, variables that are passed out of the block can be manually set for testing or override purposes.

Other Types of Modes
Other types of modes are Cas, RCas, ROut, IMan and LO. Some of these may be supported by different function blocks in the 752. For more information, see the Function Block manual, document 00809-0100-4783.

NOTE
When an upstream block is set to OOS, this will impact the output status of all downstream blocks. The figure below depicts the hierarchy of blocks:



Link Active Scheduler

The 752 can be designated to act as the backup Link Active Scheduler (LAS) in the event that the LAS is disconnected from the segment. As the backup LAS, the 752 will take over the management of communications until the host is restored.

The host system may provide a configuration tool specifically designed to designate a particular device as a backup LAS. Otherwise, this can be configured manually as follows:

⚠
1. Access the Management Information Base (MIB) for the 752.
2. To activate the LAS capability, write 0x02 to the BOOT_OPERAT_FUNCTIONAL_CLASS object (Index 605). To deactivate, write 0x01.
3. Restart the processor.

Block Instantiation

Rosemount devices are pre-configured with function blocks at the factory, the default permanent configuration for the Rosemount 752 is listed below. The Rosemount 752 can have up to nine additional instantiated function blocks.

- 1 Proportional/Integral/Derivative Block (tag name PID 1600)
- 1 Input Selector Block (tag name ISEL 1700)
- 1 Signal Characterizer Block (tag name CHAR 1800)
- 1 Arithmetic Block (tag name ARITH 1900)
- 1 Integrator Block (tag name INTEG 2000)

The Rosemount 752 supports the use of Function Block Instantiation. When a device supports block instantiation, the number of blocks and block types can be defined to match specific application needs.The number of blocks that can be instantiated is only limited by the amount of memory within the device and the block types that are supported by the device. Instantiation does not apply to standard device blocks like the Resource and LCD Transducer Block.

By reading the parameter “FREE_SPACE” in the Resource block you can determine how many blocks you can instantiate. Each block that you instantiate takes up 4.5573% of the “FREE_SPACE”.

Block instantiation is done by the host control system or configuration tool, but not all hosts are required to implement this functionality. Please refer to your specific host or configuration tool manual for more information.

Capabilities

Virtual Communication Relationship (VCRs)

There are a total of 20 VCRs. One is permanent and 19 are fully configurable by the host system. Thirty link objects are available.

Network Parameter	Value
Slot Time	6
Maximum Response Delay	4
Maximum Inactivity to Claim LAS Delay	60
Minimum Inter DLPDU Delay	7
Time Sync class	4 (1ms)
Maximum Scheduling Overhead	21
Per CLPDU PhL Overhead	4
Maximum Inter-channel Signal Skew	0
Required Number of Post-transmission-gab-ext Units	0
Required Number of Preamble-extension Units	1

Host timer recommendations

T1 = 96000
T2 = 1920000
T3 = 480000

Block Execution times

PID = 25 ms
Arithmetic = 20 ms
Input Selection = 20 ms
Signal Characterizer = 20 ms
Integrator = 20 ms

RESOURCE BLOCK

FEATURES and FEATURES_SEL

The parameters FEATURES and FEATURE_SEL determine optional behavior of the Rosemount 752.

FEATURES

The FEATURES parameter is read only and defines which features are supported by the Rosemount 752. Below is a list of the FEATURES the 752 supports.

UNICODE

All configurable string variables in the Rosemount 752, except tag names, are octet strings. Either ASCII or Unicode may be used. If the configuration device is generating Unicode octet strings, you must set the Unicode option bit.

REPORTS

The Rosemount 752 supports alert reports. The Reports option bit must be set in the features bit string to use this feature. If it is not set, the host must poll for alerts.

SOFT W LOCK and HARD W LOCK

Inputs to the security and write lock functions include the hardware security switch, the hardware and software write lock bits of the FEATURE_SEL parameter, the WRITE_LOCK parameter, and the DEFINE_WRITE_LOCK parameter.

The WRITE_LOCK parameter prevents modification of parameters within the device except to clear the WRITE_LOCK parameter. During this time, the block will function normally updating inputs and outputs and executing algorithms. When the WRITE_LOCK condition is cleared, a WRITE_ALM alert is generated with a priority that corresponds to the WRITE_PRI parameter.

The FEATURE_SEL parameter enables the user to select a hardware or software write lock or no write lock capability. To enable the hardware security function, enable the HW_SEL bit in the FEATURE_SEL parameter. When this bit has been enabled the WRITE_LOCK parameter becomes read only and will reflect the state of the hardware switch. In order to enable the software write lock, the SW_SEL bit must be set in the FEATURE_SEL parameter. Once this bit is set, the WRITE_LOCK parameter may be set to “Locked” or “Not Locked.” Once the WRITE_LOCK parameter is set to “Locked” by either the software or the hardware lock, all user requested writes as determined by the DEFINE_WRITE_LOCK parameter shall be rejected.

The DEFINE_WRITE_LOCK parameter allows the user to configure whether the write lock functions (both software and hardware) will control writing to all blocks, or only to the resource and transducer blocks. Internally updated data such as process variables and diagnostics will not be restricted by the security switch.

The following table displays all possible configurations of the WRITE_LOCK parameter.

FEATURE_SEL HW_SEL bit	FEATURE_SEL SW_SEL bit	SECURITY SWITCH	WRITE_LOCK	WRITE_LOCK Read/Write	DEFINE_WRITE_LOCK	Write access to blocks
0 (off)	0 (off)	NA	1 (unlocked)	Read only	NA	All
0 (off)	1 (on)	NA	1 (unlocked)	Read/Write	NA	All
0 (off)	1 (on)	NA	2 (locked)	Read/Write	Physical	Function Blocks only
0 (off)	1 (on)	NA	2 (locked)	Read/Write	Everything	None
1 (on)	0 (off)(1)	0 (unlocked)	1 (unlocked)	Read only	NA	All
1 (on)	0 (off)	1 (locked)	2 (locked)	Read only	Physical	Function Blocks only
1 (on)	0 (off)	1 (locked)	2 (locked)	Read only	Everything	None

(1) The hardware and software write lock select bits are mutually exclusive and the hardware select has the highest priority. When the HW_SEL bit if set to 1 (on), the SW_SEL bit is automatically set to 0 (off) and is read only.

FEATURES_SEL

FEATURES_SEL is used to turn on any of the supported features. The default setting of the Rosemount 752 does not select any of these features. Choose one of the supported features if any.

MAX_NOTIFY

The MAX_NOTIFY parameter value is the maximum number of alert reports that the resource can have sent without getting a confirmation, corresponding to the amount of buffer space available for alert messages. The number can be set lower, to control alert flooding, by adjusting the LIM_NOTIFY parameter value. If LIM_NOTIFY is set to zero, then no alerts are reported.

PlantWeb™ Alarms

The alarms and recommended actions should be used in conjunction with Section 4: Troubleshooting.

The Resource Block will act as a coordinator for PlantWeb alarms. There will be three alarm parameters (FAILED_ALARM, MAINT_ALARM, and ADVISE_ALARM) which will contain information regarding some of the device errors which are detected by the indicator software. There will be a RECOMMENDED_ACTION parameter which will be used to display the recommended action text for the highest priority alarm. FAILED_ALARM will have the highest priority followed by MAINT_ALARM and ADVISE_ALARM will be the lowest priority.

FAILED_ALARMS

A failure alarm indicates a failure within a device that will make the device or some part of the device non-operational. This implies that the device is in need of repair and must be fixed immediately. There are five parameters associated with FAILED_ALARMS specifically, they are described below.

FAILED_ENABLED
This parameter contains a list of failures in the device which makes the device non-operational that will cause an alarm to be sent. Below is a list of the failures with the highest priority first.

1. Memory Failure
2. NV Memory Failure
3. Lost Deferred Data

FAILED_MASK
This parameter will mask any of the failed conditions listed in FAILED_ENABLED. A bit on means that the condition is masked out from alarming and will not be reported.

FAILED_PRI
Designates the alarming priority of the FAILED_ALM, see “ADVISE_PRI” on page 2-12. The default is 0 and the recommended value are between 8 and 15.

FAILED_ACTIVE
This parameter displays which of the alarms is active. Only the alarm with the highest priority will be displayed. This priority is not the same as the FAILED_PRI parameter described above. This priority is hard coded within the device and is not user configurable.

FAILED_ALM
Alarm indicating a failure within a device which makes the device non-operational.

MAINT_ALARMS

A maintenance alarm indicates the device or some part of the device needs maintenance soon. If the condition is ignored, the device will eventually fail. There are five parameters associated with MAINT_ALARMS, they are described below.

MAINT_ENABLED
The MAINT_ENABLED parameter contains a list of conditions indicating the device or some part of the device needs maintenance soon. If the condition is ignored, the device will eventually fail.

MAINT_MASK
The MAINT_MASK parameter will mask any of the failed conditions listed in MAINT_ENABLED. A bit on means that the condition is masked out from alarming and will not be reported.

MAINT_PRI
MAINT_PRI designates the alarming priority of the MAINT_ALM, “MAINT_ALM” on page 2-12. The default is 0 and the recommended values is 3 to 7.

MAINT_ACTIVE
The MAINT_ACTIVE parameter displays which of the alarms is active. Only the condition with the highest priority will be displayed. This priority is not the same as the MAINT_PRI parameter described above. This priority is hard coded within the device and is not user configurable.

MAINT_ALM
An alarm indicating the device needs maintenance soon. If the condition is ignored, the device will eventually fail.

Advisory Alarms

An advisory alarm indicates informative conditions that do not have a direct impact on the device's primary functions There are five parameters associated with ADVISE_ALARMS, they are described below.

ADVISE_ENABLED
The ADVISE_ENABLED parameter contains a list of informative conditions that do not have a direct impact on the device's primary functions.

- LOI Failure
- NV Writes Deferred

ADVISE_MASK
The ADVISE_MASK parameter will mask any of the failed conditions listed in ADVISE_ENABLED. A bit on means the condition is masked out from alarming and will not be reported.

ADVISE_PRI
ADVISE_PRI designates the alarming priority of the ADVISE_ALM, see “ADVISE_PRI” on page 2-12. The default is 0 and the recommended values are 1 or 2.

ADVISE_ACTIVE
The ADVISE_ACTIVE parameter displays which of the advisories is active. Only the advisory with the highest priority will be displayed. This priority is not the same as the ADVISE_PRI parameter described above. This priority is hard coded within the device and is not user configurable.

ADVISE_ALM
ADVISE_ALM is an alarm indicating advisory alarms. These conditions do not have a direct impact on the process or device integrity.

Recommended Actions for PlantWeb Alarms

RECOMMENDED_ACTION
The RECOMMENDED_ACTION parameter displays a text string that will give a recommended course of action to take based on which type and which specific event of the PlantWeb alarms is active.

Table 2-1. RB.RECOMMENDED_ACTION

Failed/Maint/Advise Active Event	Recommended Action Text String
None	No action required
LOI Failure	Check Display and Sensor connections
NV Writes Deferred	

LCD TRANSDUCER BLOCK

The LCD meter connects directly to the Rosemount 752 electronics FOUNDATION fieldbus output board. The meter indicates output and abbreviated diagnostic messages.

The meter features a four-line display and alarm. The 0-100% scaled bar graph is not used in the Rosemount 752. The first line of five characters displays the output description, the second line of seven digits displays the actual value, the third line of six characters displays engineering units and the fourth line displays “Error” when the indicator is in alarm. The LCD meter can also display diagnostic messages.

Each parameter configured for display will appear on the LCD for a brief period before the next parameter is displayed. If the status of the parameter goes bad, the LCD will also cycle diagnostics following the displayed variable:

Figure 2-4. LCD Messaging

Custom Meter Configuration

To configure parameters 1 – 8, use the configuration parameters below.

The LCD Transducer Block can be configured to sequence eight different process variables.

The output from blocks in other devices on the segment can be linked to one of the inputs of the ISEL block and then displayed on the LCD. The LCD would then be configured to display the Block Tag of the ISEL block and the input parameter.

DISPLAY_PARAM_SEL

The DISPLAY_PARAM_SEL parameter specifies how many process variables will be displayed. Select up to eight display parameters.

BLK_TAG_#(1)

Enter the Block Tag of the function block that contains the parameter to be displayed. The default function block tags from the factory are:

PID 1200
ISEL 1300
CHAR 1400
ARITH 1500
INTEG 1600

BLK_TYPE_#(1)

Enter the Block Type of the function block that contains the parameter to be displayed. This parameter is generally selected via a drop-down menu with a list of possible function block types. (e.g. ISEL PID, etc.)

PARAM_INDEX_#(1)

The PARAM_INDEX_# parameter is generally selected via a drop-down menu with a list of possible parameter names based upon what is available in the function block type selected. Choose the parameter to be displayed.

CUSTOM_TAG_#(1)

The CUSTOM_TAG_# is an optional user-specified tag identifier that can be configured to be displayed with the parameter in place of the block tag. Enter a tag of up to five characters.

UNITS_TYPE_#(1)

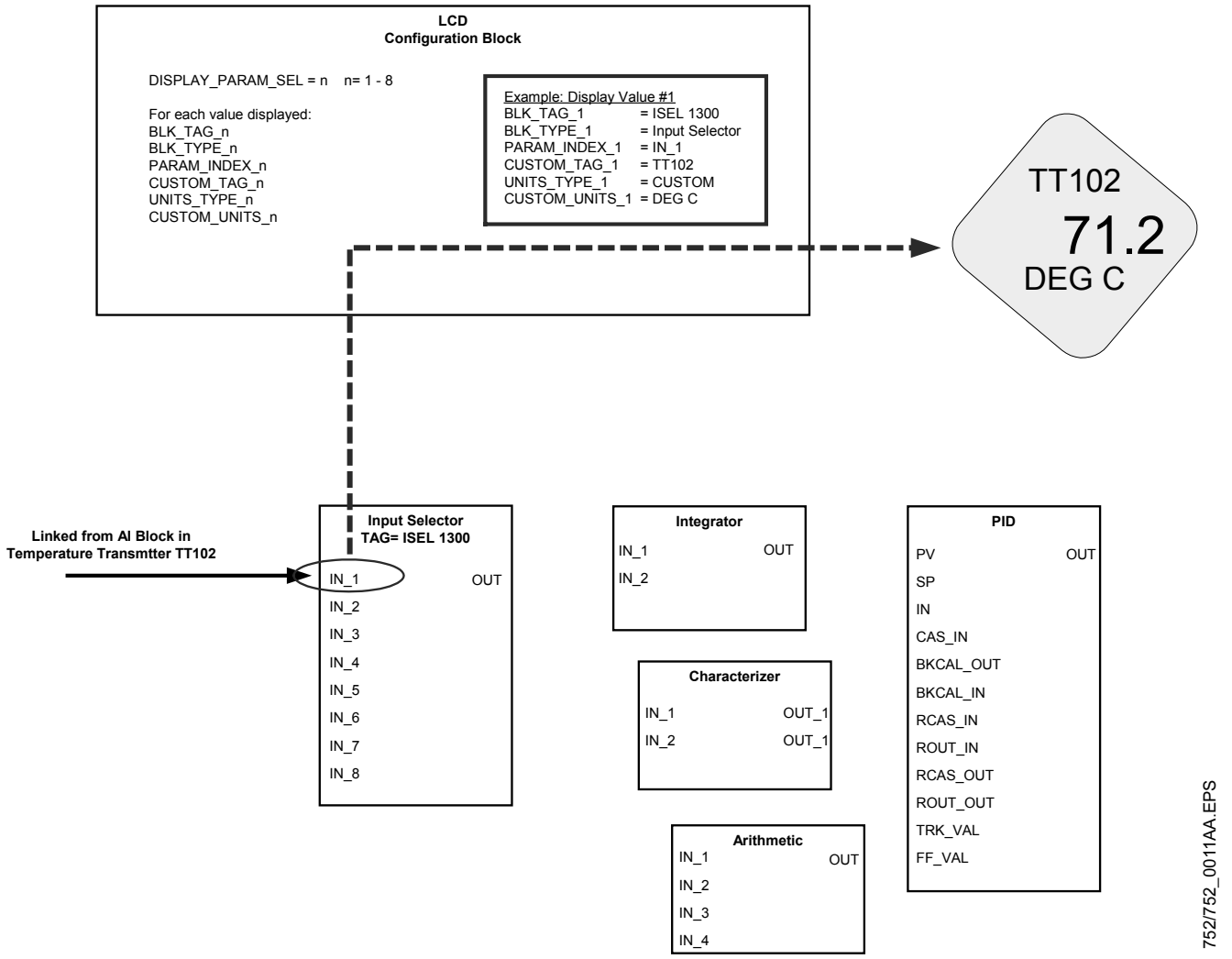
The UNITS_TYPE_# parameter is generally selected via a drop-down menu with three options: AUTO, CUSTOM, or NONE. Select AUTO only when the parameter to be displayed is pressure, temperature, or percent. For other parameters, select CUSTOM and be sure to configure the CUSTOM_UNITS_# parameter. Select NONE if the parameter is to be displayed without associated units.

CUSTOM_UNITS_#(1)

Specify custom units to be displayed with the parameter. Enter up to six characters. To display Custom Units the UNITS_TYPE_# must be set to CUSTOM.

(1) _# represents the specified parameter number.

Figure 2-5. Configuring the LCD to Display Data from a Different Device on the Fieldbus Segment



Section 3 Operation and Maintenance

OVERVIEW

This section contains information on operation and maintenance procedures.

METHODS AND MANUAL OPERATION

Each FOUNDATION fieldbus host or configuration tool has different ways of displaying and performing operations. Some hosts will use Device Descriptions (DD) and DD Methods to complete device configuration and will display data consistently across platforms. The DD can found on www.rosemount.com. There is no requirement that a host or configuration tool support these features.

The information in this section will describe how to use methods in a general fashion. In addition, if your host or configuration tool does not support methods this section will cover manually configuring the parameters involved with each method operation. For more detailed information on the use of methods, see your host or configuration tool manual.

SAFETY MESSAGES

Procedures and instructions in this section may require special precautions to ensure the safety of the personnel performing the operations. Information that raises potential safety issues is indicated by a warning symbol (⚠). Refer to the following safety messages before performing an operation preceded by this symbol.

Warnings

⚠WARNING

Explosions can result in death or serious injury.

- Do not remove the indicator covers in explosive environments when the circuit is live.
- Indicators covers must be fully engaged to meet explosion proof requirements.
- Before connecting a communicator in an explosive atmosphere, make sure the instruments in the loop are installed in accordance with intrinsically safe or nonincendive field wiring practices.

⚠WARNING

Electrical shock can result in death or serious injury.

- Avoid contact with the leads and terminals. High voltage that may be present on leads can cause electrical shock.

⚠WARNING

Performing a 'Restart with defaults' will set all function block information in the device to factory defaults. This includes the clearing of all function block links and schedule, as well as defaulting all Resource and Transducer Block user data (Advanced Diagnostic Block algorithm configurations, LCD Transducer Block parameter configuration, etc.).

RESOURCE BLOCK

Master Reset Method

⚠ To perform a master reset, run the Master Reset Method. If your system does not support methods, manually configure the Resource Block parameters listed below.

1. Set the RESTART to one of the options below:
   - Set Run to nominal state when not restarting (default)
   - Resource is not used by device”
   - ⚠ Defaults set all device parameters to FOUNDATION fieldbus default values
   - The Processor does a software reset of the CPU

Section 4 Troubleshooting

OVERVIEW

This section provides summarized troubleshooting suggestions for the most common operating problems. This section contains Rosemount 752 fieldbus troubleshooting information only.

Follow the procedures described here to verify that indicator hardware and process connections are in good working order. Always deal with the most likely checkpoints first.

SAFETY MESSAGES

Procedures and instructions in this section may require special precautions to ensure the safety of the personnel performing the operations. Information that raises potential safety issues is indicated by a warning symbol (⚠). Refer to the following safety messages before performing an operation preceded by this symbol.

Warnings

⚠WARNING

Explosions can result in death or serious injury.

- Do not remove the indicator covers in explosive environments when the circuit is live.
- Indicator covers must be fully engaged to meet explosion proof requirements.
- Before connecting a communicator in an explosive atmosphere, make sure that the instruments in the loop are installed according to intrinsically safe or nonincendive field wiring practices.

⚠CAUTION

Static electricity can damage sensitive components.

- Observe safe handling precautions for static-sensitive components.

TROUBLESHOOTING GUIDES

Figure 4-1. Rosemount 752 troubleshooting flowchart

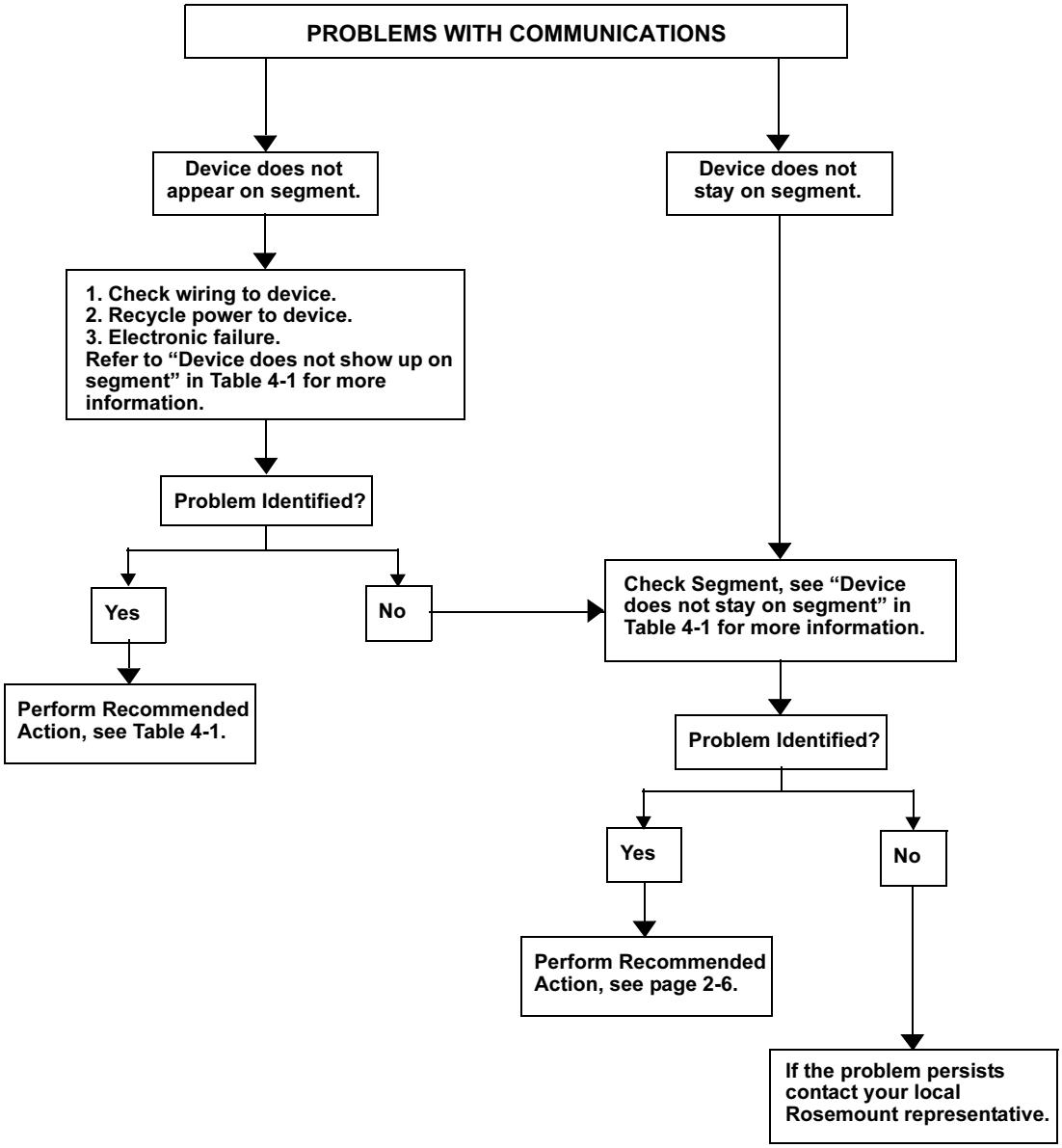


Figure 4-2. Problems with communications flowchart

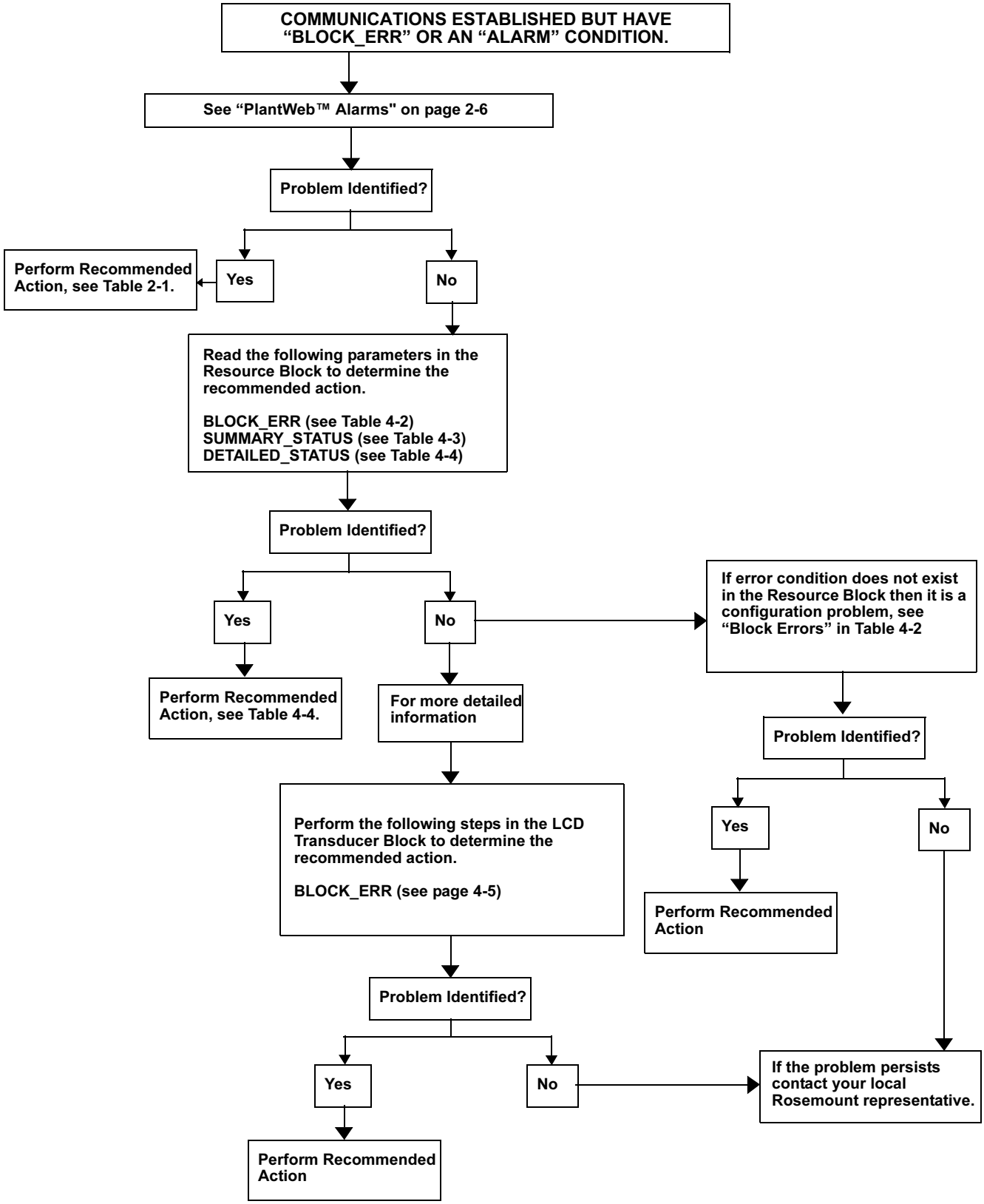


Table 4-1. Troubleshooting guide.

Symptom[1]	Cause	Recommended Actions
Device does not show up on segment	Unknown	Recycle power to device
	No power to device	1. Ensure the device is connected to the segment. 2. Check voltage at terminals. There should be 9–32Vdc. 3. Check to ensure the device is drawing current. There should be approximately 17 mA.
	Segment problems	
	Electronics failing	1. Electronics board loose in housing. 2. Replace electronics.
	Incompatible network settings	Change host network parameters. Refer to host documentation for procedure.
Device does not stay on segment[2]	Incorrect signal levels. Refer to host documentation for procedure.	1. Check for two terminators. 2. Excess cable length. 3. Bad Power supply or conditioner
	Excess noise on segment. Refer to host documentation for procedure.	1. Check for incorrect grounding. 2. Check for correct shielded wire. 3. Tighten wire connections. 4. Check for corrosion or moisture on terminals. 5. Check for Bad power supply.
	Electronics failing	1. Tighten electronics board. 2. Replace electronics.
	Other	1. Check for water in the terminal housing.

(1) The corrective actions should be done with consultation of your system integrator.
(2) Wiring and installation 31.25 kbit/s, voltage mode, wire medium application guide AG-140 available from the fieldbus Foundation.

RESOURCE BLOCK

This section describes error conditions found in the Resource block. Read Table 4-2 through Table 4-4 to determine the appropriate corrective action.

Block Errors

Table 4-2. Resource Block BLOCK_ERR messages

Table 4-2 lists conditions reported in the BLOCK_ERR parameter.

Condition Name and Description
Other
Simulate Active: This indicates that the simulation switch is in place. This is not an indication that the I/O blocks are using simulated data.
Device Fault State Set
Device Needs Maintenance Soon
Memory Failure: A memory failure has occurred in FLASH, RAM, or EEPROM memory
Lost Static Data: Static data that is stored in non-volatile memory has been lost.
Lost NV Data: Non-volatile data that is stored in non-volatile memory has been lost.
Device Needs Maintenance Now
Out of Service: The actual mode is out of service.

Table 4-3. Resource Block SUMMARY_STATUS messages

Condition Name
Uninitilized
No repair needed
Repairable
Call Service Center

Table 4-4. Resource Block DETAILED_STATUS with recommended action messages

Condition Name	Recommended Action
LOI Transducer block error	1. Restart processor 2. Check display connection 3. Call service center
Mfg. Block integrity error	1. Restart processor 2. Call service center
Non-Volatile memory integrity error	1. Restart processor 2.Call service center
ROM integrity error	1. Restart processor 2. Call service center
Lost Deferred NV Data	1. Restart processor 2. Call service center
NV writes deferred (warning)	1. Restart processor 2. Call service center

LCD TRANSDUCER BLOCK

This section describes error conditions found in the LCD Transducer Block. Read Table 4-5 and to determine the appropriate corrective action.

Self Test Procedure for the LCD

The SELF_TEST parameter in the Resource block will test LCD segments. When running, the segments of the display should light up for about five seconds.

If your host system supports methods refer to your host documentation on how to run the *Self Test* method. If your host system does not support methods than you can run this test manually be following the steps below.

1. Put Resource block into *OOS* (Out of Service).
2. Go to the parameter called *SELF_TEST* and write the value Self test (0x2).
3. Observe the LCD screen when you are doing this. All of the segments should light up.
4. Put the Resource block back into *AUTO*.

Table 4-5. LCD Transducer Block BLOCK_ERR messages

Condition Name and Description
Other
Out of Service: The actual mode is out of service.

Symptom	Possible Causes	Recommended Action
The LCD displays “DSPLY#INVLID.” Read the BLOCK_ERR and if it says “BLOCK CONFIGURATION” perform the Recommended Action	One or more of the display parameters are not configured properly.	See “LCD Transducer Block" on page 2-16.
“752” is being displayed or not all of the values are being displayed.	The LCD block parameter “DISPLAY_PARAMETER_SELECT is not properly configured.	See “LCD Transducer Block" on page 2-16.
The display reads OOS	The resource and or the LCD Transducer block are OOS.	Verify that both blocks are in “AUTO,”
The display is hard to read.	Some of the LCD segments may have gone bad.	See Self Test procedure above. If some of the segment is bad, replace the LCD.
	Device is out of the temperature limit for the LCD. (-20 to 85 °C)	Check ambient temperature of the device.

Appendix A Reference Information

SPECIFICATIONS

Functional Specifications

Current Consumption
17.5mA

Power Requirements
External power required;
operates on 9.0 to 32.0 V dc terminal voltage

Temperature Limits
-4 to 185°F (-20 to 85°C)

Ambient Storage
-40 to 185°F (-40 to 85°C)

Humidity Limits
0 - 100% relative humidity

Electrical Connections
1/2 - 14 NPT, G 1/2, and M20 x 1.5 (CM20) conduit

Performance Specifications

Configurable to display up to eight function block output values.
Display sequences through configured variables at 3 second intervals.

Block Execution Times
PID: 25 ms
Arithmetic: 20 ms
Input Selection: 20 ms
Signal Characterizer: 20 ms
Integrator: 20 ms

Physical Specifications

Weight
2.5 lb (1.1 kg)

DIMENSIONAL DRAWINGS

Figure A-1. Remote Pipe Mount Meter Mounting Configurations

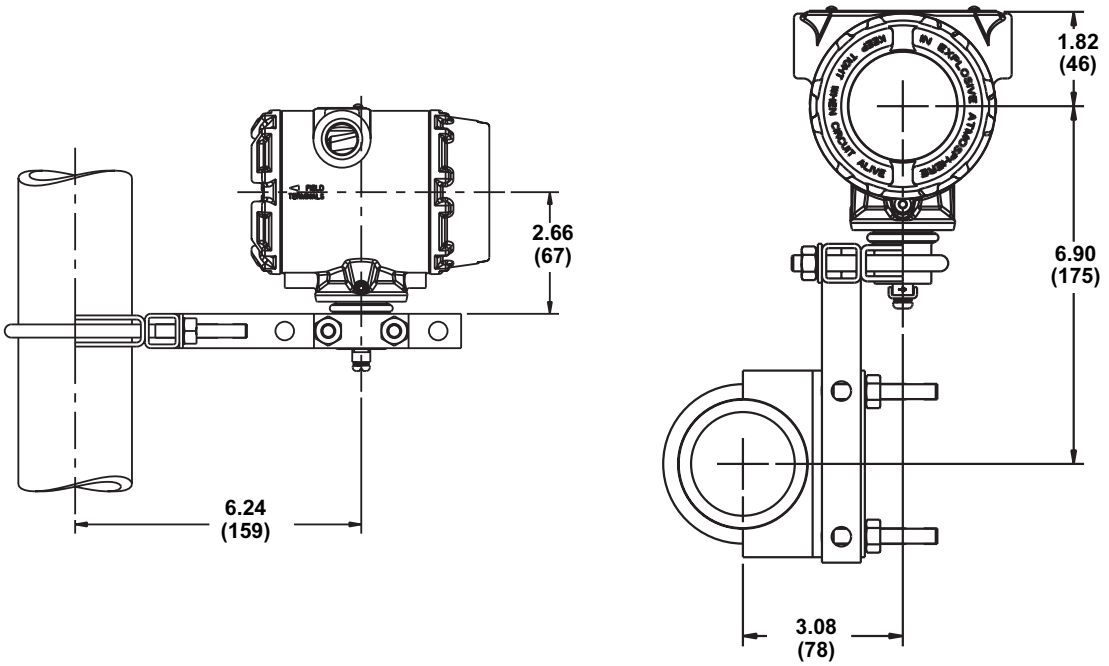
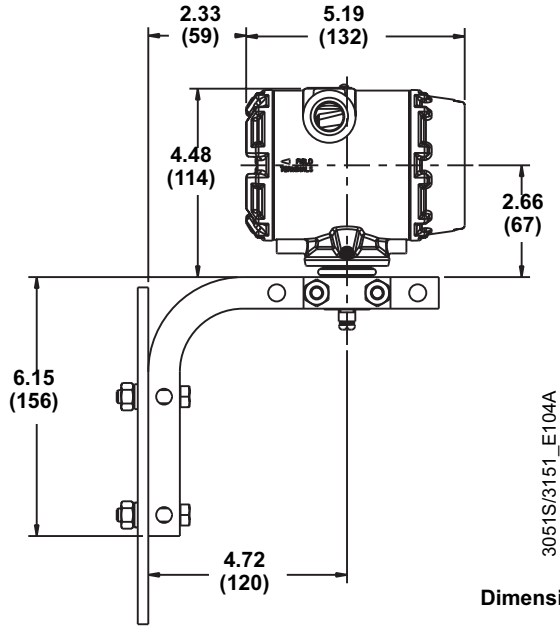


Figure A-2. Remote Panel Mount Meter Mounting Configurations



Dimensions are in inches (millimeters)

ORDERING INFORMATION

Model	Product Type		
752	Fieldbus Remote Indicator		
Code	**Transmitter Output**		
F	FOUNDATION Fieldbus		
Code	**Housing Style**	**Material**	**Conduit Entry Size**
1A	PlantWeb housing	Aluminum	1/2 - 14 NPT
1B	PlantWeb housing	Aluminum	M20 x 1.5 (CM20)
1C	PlantWeb housing	Aluminum	G1/2
Code	**Options**		
	PlantWeb Control Anywhere Software		
A01	Regulatory Control Suite: PID, arith, signal char, integ, etc.		
	Product Certifications		
E1	CENELEC Flame-Proof		
I1	CENELEC Intrinsic Safety		
IA	CENELEC FISCO Intrinsic Safety		
N1	CENELEC Type N		
K1	CENELEC Flame-Proof, Intrinsic Safety, Type N (Combination of E1, I1, and N1)		
ND	CENELEC Dust Ignition Proof		
E4	JIS Flame-Proof		
I4	JIS Intrinsic Safe		
K4	JIS Flame-Proof and Intrinsic Safety		
E5	FM Explosion-Proof		
I5	FM Intrinsic Safe and Non-Incendive		
IE	FM FISCO Intrinsic Safety		
K5	FM Explosion-Proof, Intrinsically Safe, and Non-Incendive		
E6	CSA Explosion-Proof		
I6	CSA Intrinsic Safety and Division 2		
IF	CSA FISCO Intrinsic Safety		
K6	CSA Explosion-Proof, Intrinsic Safe, Non-Incendive		
E7	SAA Flame-Proof		
I7	SAA Intrinsic Safety		
N7	SAA Type N		
K7	SAA Flame-Proof, Intrinsic Safety, and Type N		
KA	Combination of CENELEC and CSA Flame-Proof, Intrinsic Safety, Non-Incendive		
KB	Combination of FM and CSA Explosion-Proof, Intrinsic Safety, Division 2		
KC	Combination of FM and CENELEC Explosion-Proof and Intrinsic Safety		
	Transient Terminal Block		
T1	Transient Protection		
Typical Model Number: 752 F 1A A01 E1			

Appendix B Product Certificates

APPROVED MANUFACTURING LOCATIONS

Rosemount Inc. — Chanhassen, Minnesota, USA

European Directive Information

The EC declaration of conformity for all applicable European directives for this product can be found on the Rosemount website at www.rosemount.com. A hard copy may be obtained by contacting our local sales office.

Electro Magnetic Compatibility (EMC)

EN 61326-1:1997

ATEX Directive (94/9/EC)

Emerson Process Management complies with the ATEX Directive.

Hazardous Locations Certifications

North American Certifications

Factory Mutual (FM)

E5 Explosion-Proof for Class I, Division 1, Groups B, C, and D; dust-ignition proof for Class II and Class III, Division 1, Groups E, F, and G;
hazardous locations;
enclosure Type 4X,
conduit seal not required.

I5/IE Intrinsically Safe for use in Class I, Division 1,
Groups A, B, C, and D; Class II, Division 1,
Groups E, F, and G; Class III, Division 1 Class I, Zone 0, AEx ia IIC T4
when connected in accordance with Rosemount drawing 00752-1010;
Temperature Code T4;
Non-incendive for Class I, Division 2, Groups A, B, C, and D.
Enclosure Type 4X
For entity parameters see control drawing 00752-1010.

European Certifications

I1/IA ATEX Intrinsic Safety
Certificate No.: Baseefa03ATEX0239X ⟨Ex⟩ II 1G
EEx ia IIC T4 (-20°C ≤ Ta ≤ 60°C)
CE 1180
Input Parameters:

Fieldbus	FISCO Group IIC	FISCO Group IIB
U_i = 30 V dc	U_i = 15 V dc	U_i = 15 V dc
I_i = 300 mA	I_i = 215 mA	I_i = 500 mA
P_i = 1.3 W	P_i = 2 W	P_i = 5.32 W
C_i = 0	C_i = 0	C_i = 0
L_i = 0	L_i = 0	L_i = 0

SPECIAL CONDITIONS FOR SAFE USE (X)

1. When fitted with the transient option, the apparatus is not capable of withstanding the 500V test as defined in Clause 6.4.12 of EN 50020:2002. This must be taken into account during installation.
2. The enclosure may be aluminium, protected against low-levels of impact by a coating of epoxy polyester or polyurethane paint. The risk of high-levels of impact must be considered in any installation and protected accordingly.

N1 ATEX Non-incendive
Certificate No.: Baseefa03ATEX0240X ⟨Ex⟩ II 3 G
EEx nA II T5 (Ta = -20 °C TO 70 °C)
Input Parameters:
U_i = 45 V dc
C_i = 0
L_i = 0

Special Conditions for Safe Use (x)

The apparatus is not capable of withstanding the 500V insulation test required by Clause 9.1 of EN 50021: 1999. This must be taken into account when installing the apparatus.

E1 CENELEC Flame-Proof (Pending)
⟨Ex⟩ II 2 G
EEx d IIC T6 (T_{amb} = -20 °C to 65 °C)
EEx d IIC T5 (T_{amb} = -20 °C to 80 °C)
V_{max} = 42.4 V
CE 1180

ND CENELEC Dust (Pending)
⟨Ex⟩ II 1 D
T105°C (T_{amb} = -20°C to 80°C)
V_{max} = 32 V
A = 27 mA
IP66
CE 1180

APPROVAL DRAWINGS

CONFIDENTIAL AND PROPRIETARY INFORMATION IS CONTAINED HEREIN AND MUST BE HANDLED ACCORDINGLY

REVISIONS

REV	DESCRIPTION	CHG. NO.	APP'D	DATE
AA	NEW RELEASE	RTC1014654	J.P.B.	2/25/03
AB	CHG PER AGENCY REQUEST	RTC1015204	J.P.B.	4/14/03

ENTITY APPROVALS FOR MODEL 752

OUTPUT CODE F (FIELDBUS) I.S. SEE SHEETS 2
FISCO SEE SHEETS 3-4
ALL OUTPUT CODES NONINCENDIVE SEE SHEETS 5

THE ROSEMOUNT TRANSMITTERS LISTED ABOVE ARE APPROVED BY F.M. APPROVALS AS INTRINSICALLY SAFE WHEN USED IN CIRCUIT WITH F.M. APPROVED BARRIERS WHICH MEET THE ENTITY PARAMETERS LISTED IN THE CLASS I, II, AND III, DIVISION 1 GROUPS INDICATED.

TO ASSURE AN INTRINSICALLY SAFE SYSTEM, THE TRANSMITTER AND BARRIER MUST BE WIRED IN ACCORDANCE WITH THE BARRIER MANUFACTURER'S FIELD WIRING INSTRUCTIONS AND THE APPLICABLE CIRCUIT DIAGRAM.

CAD MAINTAINED (MicroStation)

UNLESS OTHERWISE SPECIFIED DIMENSIONS IN INCHES [mm]. REMOVE ALL BURRS AND SHARP EDGES. MACHINE SURFACE FINISH 125

-TOLERANCE-
.X ± .1 [2,5]
.XX ± .02 [0,5]
.XXX ± .010 [0,25]

FRACTIONS ± 1/32 ANGLES ± 2°

DO NOT SCALE PRINT

Form Rev AC

CONTRACT NO.

DR. Myles Lee Miller 1/14/03

CHK'D

APP'D. John Brewer 2/25/03

APP'D. GOVT.

EMERSON. Process Management

ROSEMOUNT®
8200 Market Boulevard • Chanhassen, MN 55317 USA

TITLE
INSTALLATION OF I.S. & NONINCENDIVE F.M. FOR 752

SIZE	FSCM NO	DWG NO.	
A		00752-1010	

SCALE N/A WT. SHEET 1 OF 6

REVISIONS				
REV	DESCRIPTION	CHG. NO.	APP'D	DATE
AB				

ENTITY CONCEPT APPROVALS

THE ENTITY CONCEPT ALLOWS INTERCONNECTION OF INTRINSICALLY SAFE APPARATUS TO ASSOCIATED APPARATUS NOT SPECIFICALLY EXAMINED IN COMBINATION AS A SYSTEM. THE APPROVED VALUES OF MAX. OPEN CIRCUIT VOLTAGE (Voc, Uo OR Vt) AND MAX. SHORT CIRCUIT CURRENT (Isc, Io, OR It) AND MAX. POWER Po(Voc X Isc/4) OR (Vt X It/4), FOR THE ASSOCIATED APPARATUS MUST BE LESS THAN OR EQUAL TO THE MAXIMUM SAFE INPUT VOLTAGE (Vmax, OR U_i), MAXIMUM SAFE INPUT CURRENT (Imax OR I_i), AND MAXIMUM SAFE INPUT POWER (Pmax OR P_i) OF THE INTRINSICALLY SAFE APPARATUS. IN ADDITION, THE APPROVED MAX. ALLOWABLE CONNECTED CAPACITANCE (Ca) OF THE ASSOCIATED APPARATUS MUST BE GREATER THAN THE SUM OF THE INTERCONNECTING CABLE CAPACITANCE AND THE UNPROTECTED INTERNAL CAPACITANCE (C_i) OF THE INTRINSICALLY SAFE APPARATUS, AND THE APPROVED MAX. ALLOWABLE CONNECTED INDUCTANCE (La) OF THE ASSOCIATED APPARATUS MUST BE GREATER THAN THE SUM OF THE INTERCONNECTING CABLE INDUCTANCE AND THE UNPROTECTED INTERNAL INDUCTANCE (L_i) OF THE INTRINSICALLY SAFE APPARATUS.

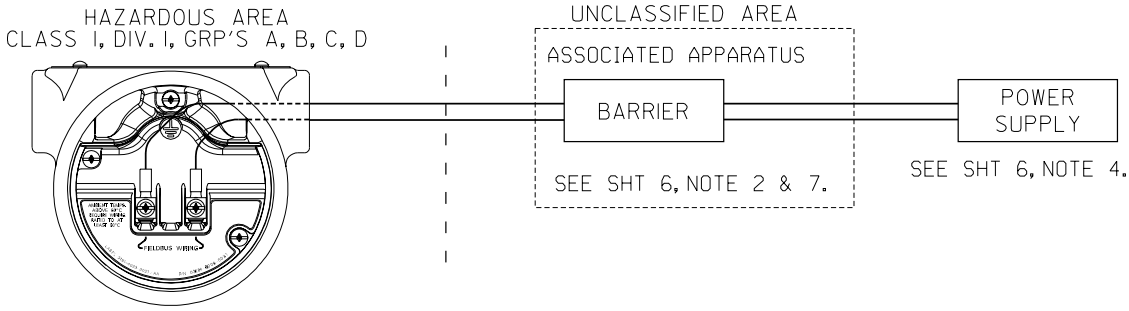
NOTE: ENTITY PARAMETERS LISTED APPLY ONLY TO ASSOCIATED APPARATUS WITH LINEAR OUTPUT.

FOR OUTPUT CODE F (MODEL 752)

CLASS I, DIV. 1, GROUPS A, B, C AND D

U_i or V_{MAX} = 30V	Uo, V_T, OR V_{OC} IS LESS THAN OR EQUAL TO 30V
I_i OR I_{MAX} = 300mA	Io, I_T, OR I_{SC} IS LESS THAN OR EQUAL TO 300mA
P_i OR P_{MAX} = 1.3 WATT	P_i ($\frac{V_T \times I_T}{4}$) OR ($\frac{Voc \times Isc}{4}$) IS LESS THAN OR EQUAL TO 1.3 WATT
C_I = 0 μf	C_A IS GREATER THAN 0 μf
L_I = 0 μH	L_A IS GREATER THAN 0 μH
T4 (-20°C ≤ Ta ≤ +60°C)	

CIRCUIT DIAGRAM I
ONE BARRIER OR CONVERTER:
SINGLE OR DUAL CHANNEL



OUTPUT CODE F

Rosemount Inc. 8200 Market Boulevard Chanhassen, MN 55317 USA			CAD MAINTAINED (MicroStation)	
DR. Myles Lee Miller	SIZE A	FSCM NO	DWG NO. 00752-1010	
ISSUED	SCALE N/A	WT. ———	SHEET 2 OF 6	

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REVISIONS				
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AB				

FISCO CONCEPT

THE FISCO CONCEPT ALLOWS INTERCONNECTION OF INTRINSICALLY SAFE APPARATUS TO ASSOCIATED APPARATUS NOT SPECIALLY EXAMINED IN SUCH COMBINATION. THE CRITERIA FOR INTERCONNECTION IS THAT THE VOLTAGE (U_i OR Vmax), THE CURRENT (I_i OR Imax), AND THE POWER (P_i or Pmax) WHICH AN INTRINSICALLY SAFE APPARATUS CAN RECEIVE AND REMAIN INTRINSICALLY SAFE CONSIDERING FAULTS, MUST BE EQUAL OR GREATER THAN VOLTAGE (Uo, Voc, OR Vt), THE CURRENT (Io, Isc, OR It) AND THE POWER (Po OR Pmax) LEVELS WHICH CAN BE DELIVERED BY THE ASSOCIATED APPARATUS, CONSIDERING FAULTS AND APPLICABLE FACTORS. IN ADDITION, THE MAXIMUM UNPROTECTED CAPACITANCE (C_i) AND THE INDUCTANCE (L_i) OF EACH APPARATUS (OTHER THAN THE TERMINATION) CONNECTED TO THE FIELDBUS MUST BE LESS THAN OR EQUAL TO 5 nF AND 10 µH RESPECTIVELY.

IN EACH SEGMENT ONLY ONE ACTIVE DEVICE, NORMALLY THE ASSOCIATED APPARATUS, IS ALLOWED TO PROVIDE THE NECESSARY ENERGY FOR THE FIELDBUS SYSTEM. THE VOLTAGE Uo (OR Voc OR Vt) OF THE ASSOCIATED APPARATUS IS LIMITED TO A RANGE OF 14V TO 24Vd.c. ALL OTHER EQUIPMENT CONNECTED TO THE BUS CABLE HAS TO BE PASSIVE, MEANING THAT THEY ARE NOT ALLOWED TO PROVIDE ENERGY TO THE SYSTEM, EXCEPT A LEAKAGE CURRENT OF 50uA FOR EACH CONNECTED DEVICE. SEPARATELY POWERED EQUIPMENT NEEDS GALVANIC ISOLATION TO ASSURE THAT THE INTRINSICALLY SAFE FIELDBUS CIRCUIT REMAINS PASSIVE.

THE CABLE USED TO INTERCONNECT DEVICES NEEDS TO HAVE THE PARAMETERS IN THE FOLLOWING RANGE:

Loop Resistance R':	15.....150 Ohm/km
Inductance per unit length L':	0.4.....1 mH/km
Capacitance per unit length C':	80.....200 nF

C' = C' line/line + 0.5C' line/screen, if both lines are floating, or
C' = C' line/line + C' line/screen, if the screen is connected to one line

Length of trunk cable:	less than or equal to 1000m
Length of spur cable:	less than or equal to 30m
Length of spur splice:	less than or equal to 1m

AT EACH END OF THE TRUNK CABLE AN APPROVED INFALLIBLE LINE TERMINATION WITH THE FOLLOWING PARAMETERS IS SUITABLE:

R = 90.....100Ohm C = 0.....2.2uF

ONE OF THE ALLOWED TERMINATIONS MIGHT ALREADY BE INTEGRATED IN THE ASSOCIATED APPARATUS. THE NUMBER OF PASSIVE APPARATUS CONNECTED TO THE BUS SEGMENT IS NOT LIMITED DUE TO I. S. REASONS. IF THE ABOVE RULES ARE RESPECTED, UP TO A TOTAL LENGTH OF 1000 m (SUM OF TRUNK AND ALL SPUR CABLES) OF CABLE IS PERMITED. THE INDUCTANCE AND THE CAPACITANCE OF THE CABLE WILL NOT IMPAIR THE INTRINSIC SAFETY OF THE INSTALLATION.

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DR. Myles Lee Miller	SIZE A	FSCM NO	DWG NO. 00752-1010
ISSUED	SCALE N/A	WT. ———	SHEET 3 OF 6

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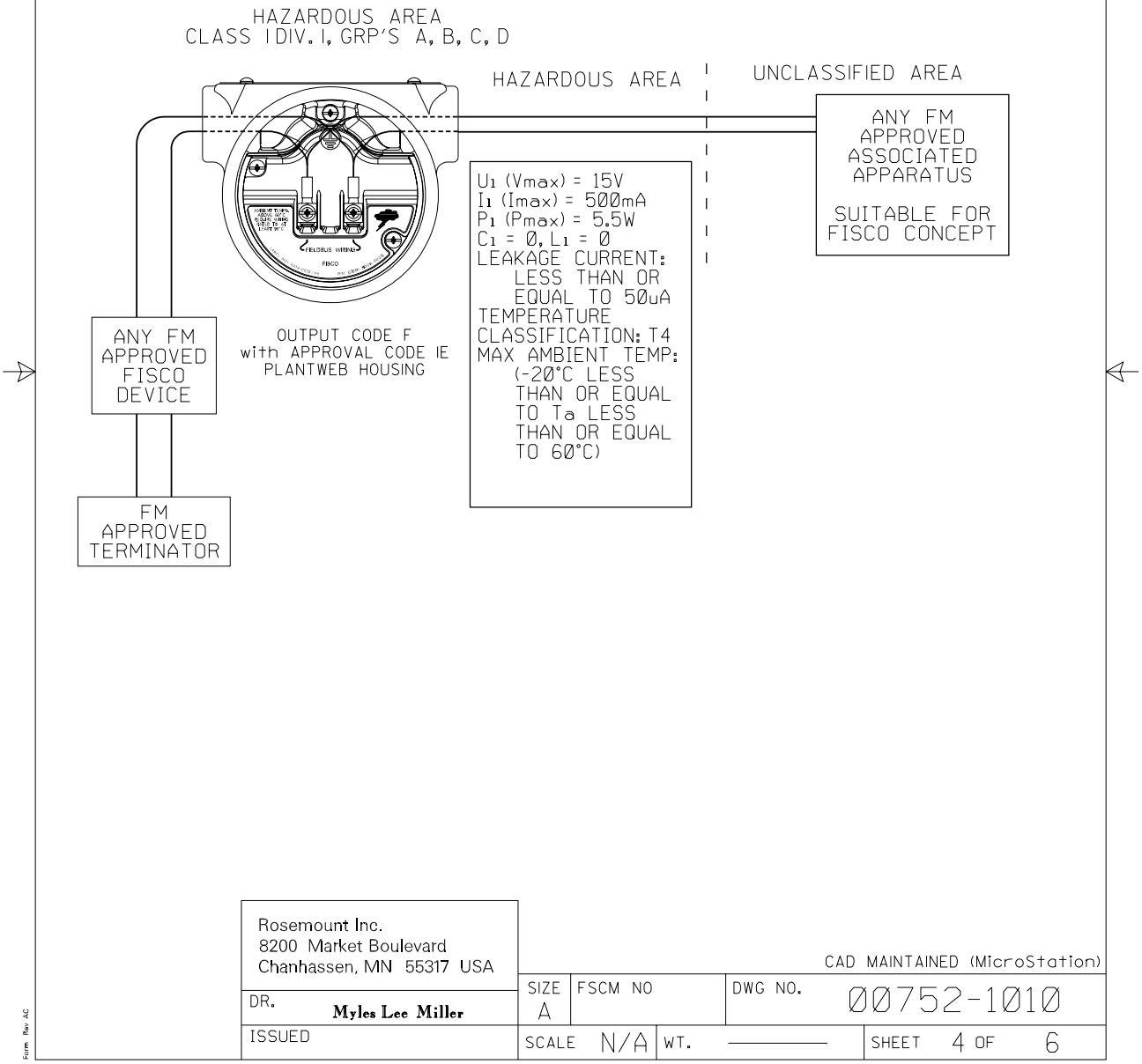
REVISIONS				
REV	DESCRIPTION	CHG. NO.	APP'D	DATE
AB				

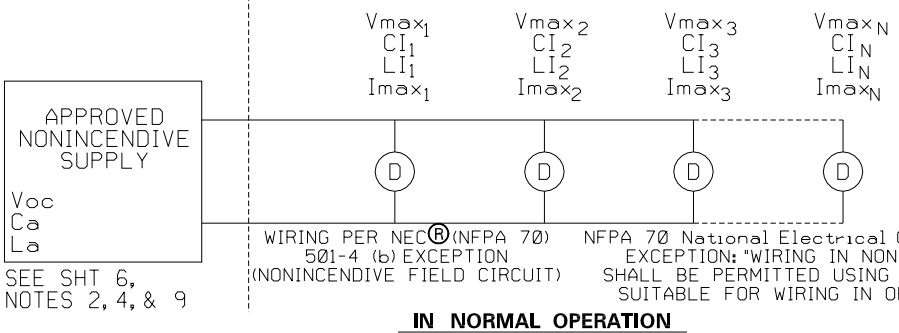


REVISIONS				
REV	DESCRIPTION	CHG. NO.	APP'D	DATE
AB				

NONINCENDIVE FIELD CIRCUIT
CLASS I, DIV. 2 LOCATIONS

NON-CLASSIFIED LOCATION

HAZARDOUS (CLASSIFIED) LOCATION
CLASS I, DIV. 2, GRP'S A, B, C, D



SEE SHT 6, NOTES 2, 4, & 9

WIRING PER NEC® (NFPA 70) 501-4 (b) EXCEPTION (NONINCENDIVE FIELD CIRCUIT)

NFPA 70 National Electrical Code® ARTICLE 501-4(b) EXCEPTION: "WIRING IN NONINCENDIVE CIRCUITS SHALL BE PERMITTED USING ANY OF THE METHODS SUITABLE FOR WIRING IN ORDINARY LOCATIONS."

IN NORMAL OPERATION

DEVICES CONTROL THROUGH-CURRENT

PARAMETERS (NON-INCENDIVE FIELD WIRING)	DEVICE
Vmax	FIELDBUS 35v
Maximum normal operating current	27mA
C_1	0uF
L_1	0uH

$Imax_N >= Iq_N + Isignal_N$

ROSEMOUNT 752 TRANSMITTERS ARE CURRENT CONTROLLERS ON INDIVIDUAL PARALLEL BRANCHES WITH RESPECT TO THE POWER SUPPLY. IN NONINCENDIVE INSTALLATIONS THE Imax FOR EACH TRANSMITTER IS NOT RELATED TO THE MAXIMUM CURRENT OF THE POWER SUPPLY (Isc) IN THE SAME MANNER AS FOR TRANSMITTER INSTALLED PER I.S. REQUIREMENTS, BECAUSE NONINCENDIVE REQUIREMENTS INCLUDE ONLY NORMAL OPERATING CONDITIONS.

REFERENCE: APPENDIX A7 (FM3611 1999)

Imax for an individual device = Iq + Isignal

Iq =Quiescent current through device (Maximum quiescent current for the device)

Isignal =Signaling current through device (Protocol may limit signaling to one device at a time)

Operating Imax = $Iq_1 + Iq_2 + ... + Iq_N + I_{signal}$ max

I_{signal} max = Max. of ($Isignal_1$, $Isignal_2$ ..... $Isignal_N$)

TEMP CODE: T4 (-20°C ≤ Ta ≤ +60°C)

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DR. Myles Lee Miller	SIZE A	FSCM NO	DWG NO. 00752-1010
ISSUED	SCALE N/A	WT.	SHEET 5 OF 6

Form Rev AC

REVISIONS				
REV	DESCRIPTION	CHG. NO.	APP'D	DATE
AB				

NOTES:

1. NO REVISION TO THIS DRAWING WITHOUT PRIOR APPROVAL BY FM APPROVALS.
2. ASSOCIATED APPARATUS MANUFACTURER'S INSTALLATION DRAWING MUST BE FOLLOWED WHEN INSTALLING THIS EQUIPMENT.
3. DUST-TIGHT CONDUIT SEAL MUST BE USED WHEN INSTALLED IN CLASS II AND CLASS III ENVIRONMENTS.
4. CONTROL EQUIPMENT CONNECTED TO BARRIER MUST NOT USE OR GENERATE MORE THAN 250 Vrms or Vdc.
5. RESISTANCE BETWEEN INTRINSICALLY SAFE GROUND AND EARTH GROUND MUST BE LESS THAN 1 OHM.
6. INSTALLATION SHOULD BE IN ACCORDANCE WITH ANSI/ISA-12.06.01 "INSTALLATION OF INTRINSICALLY SAFE SYSTEMS FOR HAZARDOUS (CLASSIFIED LOCATIONS" AND THE NATIONAL ELECTRICAL CODE (ANSI/NFPA 70).
7. THE ASSOCIATED APPARATUS MUST BE APPROVED BY FM APPROVALS.
8. WARNING - SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC AND NON-INCENDIVE SAFETY.
9. ASSOCIATED APPARATUS MUST MEET THE FOLLOWING PARAMETERS:
   Uo or Voc or Vt LESS THAN or EQUAL TO U_i (Vmax)
   Io or Isc or It LESS THAN or EQUAL TO I_i (Imax)
   Po or Pmax LESS THAN or EQUAL TO P_i (Pmax)
   Ca IS GREATER THAN or EQUAL THE SUM OF ALL C_i's PLUS Ccable
   La IS GREATER THAN or EQUAL THE SUM OF ALL L_i's PLUS Lcable
10. WARNING - TO PREVENT IGNITION OF FLAMMABLE OR COMBUSTABLE ATMOSPHERES, DISCONNECT POWER BEFORE SERVICING.

Rosemount Inc.
8200 Market Boulevard
Chanhassen, MN 55317 USA

CAD MAINTAINED (MicroStation)

DR. Myles Lee Miller	SIZE A	FSCM NO	DWG NO. 00752-1010
ISSUED	SCALE N/A	WT. ———	SHEET 6 OF 6

Form Rev AC

Appendix C Block Information

RESOURCE BLOCK

This section contains information on the Rosemount 752 Resource Block. Descriptions of all Resource Block Parameters, errors, and diagnostics are included. Also the modes, alarm detection, status handling, and troubleshooting are discussed.

Definition

The resource block defines the physical resources of the device. The resource block also handles functionality that is common across multiple blocks. The block has no linkable inputs or outputs.

Parameters and Descriptions

The table below lists all of the configurable parameters of the Resource Block, including the descriptions and index numbers for each.

Parameter	Index Number	Description
ACK_OPTION	38	Selection of whether alarms associated with the function block will be automatically acknowledged.
ADVISE_ACTIVE	82	Enumerated list of advisory conditions within a device.
ADVISE_ALM	83	Alarm indicating advisory alarms. These conditions do not have a direct impact on the process or device integrity.
ADVISE_ENABLE	80	Enabled ADVISE_ALM alarm conditions. Corresponds bit for bit to the ADVISE_ACTIVE. A bit on means that the corresponding alarm condition is enabled and will be detected. A bit off means the corresponding alarm condition is disabled and will not be detected.
ADVISE_MASK	81	Mask of ADVISE_ALM. Corresponds bit of bit to ADVISE_ACTIVE. A bit on means that the condition is masked out from alarming.
ADVISE_PRI	79	Designates the alarming priority of the ADVISE_ALM
ALARM_SUM	37	The current alert status, unacknowledged states, unreported states, and disabled states of the alarms associated with the function block.
ALERT_KEY	04	The identification number of the plant unit.
BLOCK_ALM	36	The block alarm is used for all configuration, hardware, connection failure or system problems in the block. The cause of the alert is entered in the subcode field. The first alert to become active will set the Active status in the Status parameter. As soon as the Unreported status is cleared by the alert reporting task, another block alert may be reported without clearing the Active status, if the subcode has changed.
BLOCK_ERR	06	This parameter reflects the error status associated with the hardware or software components associated with a block. It is a bit string, so that multiple errors may be shown.
CLR_FSAFE	30	Writing a Clear to this parameter will clear the device FAIL_SAFE if the field condition has cleared.
CONFIRM_TIME	33	The time the resource will wait for confirmation of receipt of a report before trying again. Retry will not happen when CONFIRM_TIME=0.

Parameter	Index Number	Description
CYCLE_SEL	20	Used to select the block execution method for this resource. The 752 supports the following: Scheduled: Blocks are only executed based on the function block schedule. Block Execution: A block may be executed by linking to another blocks completion.
CYCLE_TYPE	19	Identifies the block execution methods available for this resource.
DD_RESOURCE	09	String identifying the tag of the resource which contains the Device Description for this resource.
DD_REV	13	Revision of the DD associated with the resource - used by an interface device to locate the DD file for the resource.
DEFINE_WRITE_LOCK	60	Allows the operator to select how WRITE_LOCK behaves. The initial value is “lock everything”. If the value is set to “lock only physical device” then the resource and transducer blocks of the device will be locked but changes to function blocks will be allowed.
DETAILED_STATUS	55	Indicateds the state of the indicator. See Resource Block detailed status codes.
DEV_REV	12	Manufacturer revision number associated with the resource - used by an interface device to locate the DD file for the resource.
DEV_STRING	43	This is used to load new licensing into the device. The value can be written but will always read back with a value of 0.
DEV_TYPE	11	Manufacturer’s model number associated with the resource - used by interface devices to locate the DD file for the resource.
DIAG_OPTION	46	Indicates which diagnostics licensing options are enabled.
DISTRIBUTOR	42	Reserved for use as distributor ID. No Foundation enumerations defined at this time.
DOWNLOAD_MODE	67	Gives access to the boot block code for over-the-wire downloads. 0 = Uninitialized 1 = Run mode 2 = Download mode
FAIL_SAFE	28	Condition set by loss of communication to an output block, fault promoted to an output block or physical contact. When FAIL_SAFE condition is set, then output function blocks will perform their FAIL_SAFE actions.
FAILED_ACTIVE	72	Enumerated list of failure conditions within a device.
FAILED_ALM	73	Alarm indicating a failure within a device which makes the device non-operational.
FAILED_ENABLE	70	Enabled FAILED_ALM alarm conditions. Corresponds bit for bit to the FAILED_ACTIVE. A bit on means that the corresponding alarm condition is enabled and will be detected. A bit off means the corresponding alarm condition is disabled and will not be detected.
FAILED_MASK	71	Mask of FAILED_ALM. Corresponds bit of bit to FAILED_ACTIVE. A bit on means that the condition is masked out from alarming.
FAILED_PRI	69	Designates the alarming priority of the FAILED_ALM.
FB_OPTION	45	Indicates which function block licensing options are enabled.
FEATURES	17	Used to show supported resource block options. See Error! Reference source not found. The supported features are: SOFT_WRITE_LOCK_SUPPORT, HARD_WRITE_LOCK_SUPPORT, REPORTS, and UNICODE
FEATURES_SEL	18	Used to select resource block options.
FINAL_ASSY_NUM	54	The same final assembly number placed on the neck label.
FREE_SPACE	24	Percent of memory available for further configuration. Zero in a preconfigured device.
FREE_TIME	25	Percent of the block processing time that is free to process additional blocks.
GRANT_DENY	14	Options for controlling access of host computers and local control panels to operating, tuning, and alarm parameters of the block. Not used by device.
HARD_TYPES	15	The types of hardware available as channel numbers.
HARDWARE_REV	52	Hardware revision of the hardware that has the resource block in it.
HEALTH_INDEX	84	This is an indication of the overall condition of the transmitter. This value is Used in conjunction with PlantWeb Alerts.
ITK_VER	41	Major revision number of the inter operability test case used in certifying this device as interoperable. The format and range are controlled by the Fieldbus Foundation.
LIM_NOTIFY	32	Maximum number of unconfirmed alert notify messages allowed.
MAINT_ACTIVE	77	Enumerated list of maintenance conditions within a device.

Parameter	Index Number	Description
MAINT_ALM	78	Alarm indicating the device needs maintenance soon. If the condition is ignored, the device will eventually fail.
MAINT_ENABLE	75	Enabled MAINT_ALM alarm conditions. Corresponds bit for bit to the MAINT_ACTIVE. A bit on means that the corresponding alarm condition is enabled and will be detected. A bit off means the corresponding alarm condition is disabled and will not be detected.
MAINT_MASK	76	Mask of MAINT_ALM. Corresponds bit of bit to MAINT_ACTIVE. A bit on means that the condition is masked out from alarming.
MAINT_PRI	74	Designates the alarming priority of the MAINT_ALM
MANUFAC_ID	10	Manufacturer identification number – used by an interface device to locate the DD file for the resource.
MAX_NOTIFY	31	Maximum number of unconfirmed notify messages possible.
MEMORY_SIZE	22	Available configuration memory in the empty resource. To be checked before attempting a download.
MESSAGE_DATE	57	Date associated with the MESSAGE_TEXT parameter.
MESSAGE_TEXT	58	Used to indicate changes made by the user to the device's installation, configuration, or calibration.
MIN_CYCLE_T	21	Time duration of the shortest cycle interval of which the resource is capable.
MISC_OPTION	47	Indicates which miscellaneous licensing options are enabled.
MODE_BLK	05	The actual, target, permitted, and normal modes of the block: Target: The mode to “go to” Actual: The mode the “block is currently in” Permitted: Allowed modes that target may take on Normal: Most common mode for actual
NV_CYCLE_T	23	Minimum time interval specified by the manufacturer for writing copies of NV parameters to non-volatile memory. Zero means it will never be automatically copied. At the end of NV_CYCLE_T, only those parameters which have changed need to be updated in NVRAM.
OUTPUT_BOARD_SN	53	Output board serial number.
PWA_SIMULATE	85	Parameter that allows direct writes to PWA active parameters and the detailed status bytes that activate the Plant Web alerts. The simulate switch/jumper must be "ON" before PWA_SIMULATE can be turned on. 0 = Simulation off 1 = Simulation on
RB_SFTWR_REV_ALL	51	The string will contains the following fields: Major rev: 1-3 characters, decimal number 0-255 Minor rev: 1-3 characters, decimal number 0-255 Build rev: 1-5 characters, decimal number 0-255 Time of build: 8 characters, xx:xx:xx, military time Day of week of build: 3 characters, Sun, Mon,... Month of build: 3 characters, Jan, Feb. Day of month of build: 1-2 characters, decimal number 1-31 Year of build: 4 characters, decimal Builder: 7 characters, login name of builder
RB_SFTWR_REV_BUILD	50	Build of software that the resource block was created with.
RB_SFTWR_REV_MAJOR	48	Major revision of software that the resource block was created with.
RB_SFTWR_REV_MINOR	49	Minor revision of software that the resource block was created with.
RECOMMENDED_ACTION	68	Enumerated list of recommended actions displayed with a device alert.
RESTART	16	Allows a manual restart to be initiated. Several degrees of restart are possible. They are the following: 1 Run – nominal state when not restarting 2 Restart resource – not used 3 Restart with defaults – set parameters to default values. See START_WITH_DEFAULTS below for which parameters are set. 4 Restart processor – does a warm start of CPU.
RS_STATE	07	State of the function block application state machine.
SAVE_CONFIG_BLOCKS	62	Number of EEPROM blocks that have been modified since last burn. This value will count down to zero when the configuration is saved.

Parameter	Index Number	Description
SAVE_CONFIG_NOW	61	Allows the user to optionally save all non-volatile information immediately.
SECURITY_IO	65	Status of security switch.
SELF_TEST	59	Instructs resource block to perform self-test. Tests are device specific.
SET_FSAFE	29	Allows the FAIL_SAFE condition to be manually initiated by selecting Set.
SHED_RCAS	26	Time duration at which to give up on computer writes to function block RCas locations. Shed from RCas shall never happen when SHED_ROUT = 0
SHED_ROUT	27	Time duration at which to give up on computer writes to function block ROut locations. Shed from ROut shall never happen when SHED_ROUT = 0
SIMULATE_IO	64	Status of simulate switch.
SIMULATE_STATE	66	The state of the simulate switch: 0 = Uninitialized 1 = Switch off, simulation not allowed 2 = Switch on, simulation not allowed (need to cycle jumper/switch) 3 = Switch on, simulation allowed
ST_REV	01	The revision level of the static data associated with the function block.
START_WITH_DEFAULTS	63	0 = Uninitialized 1 = do not power-up with NV defaults 2 = power-up with default node address 3 = power-up with default pd_tag and node address 4 = power-up with default data for the entire communications stack (no application data)
STRATEGY	03	The strategy field can be used to identify grouping of blocks.
SUMMARY_STATUS	56	An enumerated value of repair analysis.
TAG_DESC	02	The user description of the intended application of the block.
TEST_RW	08	Read/write test parameter - used only for conformance testing.
UPDATE_EVT	35	This alert is generated by any change to the static data.
WRITE_ALM	40	This alert is generated if the write lock parameter is cleared.
WRITE_LOCK	34	If set, no writes from anywhere are allowed, except to clear WRITE_LOCK. Block inputs will continue to be updated.
WRITE_PRI	39	Priority of the alarm generated by clearing the write lock.
XD_OPTION	44	Indicates which transducer block licensing options are enabled.

LCD TRANSDUCER BLOCK

Parameter	Index	Description
ALERT_KEY	4	The identification number of the plant unit.
BLK_TAG_1	15	The tag of the block containing DP1.
BLK_TAG_2	21	The tag of the block containing DP2.
BLK_TAG_3	27	The tag of the block containing DP3.
BLK_TAG_4	33	The tag of the block containing DP4.
BLK_TAG_5	39	The tag of the block containing DP5.
BLK_TAG_6	45	The tag of the block containing DP6.
BLK_TAG_7	51	The tag of the block containing DP7.
BLK_TAG_8	57	The tag of the block containing DP8.
BLK_TYPE_1	14	The enumerated block type for DP1's block.
BLK_TYPE_2	20	The enumerated block type for DP2's block.
BLK_TYPE_3	26	The enumerated block type for DP3's block.
BLK_TYPE_4	32	The enumerated block type for DP4's block.
BLK_TYPE_5	38	The enumerated block type for DP5's block.
BLK_TYPE_6	44	The enumerated block type for DP3's block.
BLK_TYPE_7	50	The enumerated block type for DP7's block.
BLK_TYPE_8	56	The enumerated block type for DP8's block.
BLK_TYPE_8	62	The enumerated block type for DP8's block.
BLOCK_ALM	8	The BLOCK_ALM is used for all configuration, hardware, connection failure or system problems in the block. The cause of the alert is entered in the subcode field. The first alert to become active will set the Active status in the Status attribute. As soon as the Unreported status is cleared by the alert reporting task, another block alert may be reported without clearing the Active status, if the subcode has changed.
BLOCK_ERR	6	This parameter reflects the error status associated with the hardware or software components associated with a block. it is a bit string, so that multiple errors may be shown.
COLLECTION_DIRECTORY	12	A directory that specifies the number, starting indicies, and DD Item ID's of the data collections in each transducer block.
CUSTOM_TAG_1	17	The block description that is displayed for DP1.
CUSTOM_TAG _2	23	The block description that is displayed for DP2.
CUSTOM_TAG _3	29	The block description that is displayed for DP3.
CUSTOM_TAG _4	35	The block description that is displayed for DP4.
CUSTOM_TAG_5	41	The block description that is displayed for DP5.
CUSTOM_TAG_6	47	The block description that is displayed for DP6.
CUSTOM_TAG_7	53	The block description that is displayed for DP7.
CUSTOM_TAG_8	59	The block description that is displayed for DP8.
CUSTOM_UNITS_1	19	This is the user entered units that are displayed when UNITS_TYPE_1=Custom.
CUSTOM_UNITS _2	25	This is the user entered units that are displayed when UNITS_TYPE_2=Custom.
CUSTOM_UNITS _3	31	This is the user entered units that are displayed when UNITS_TYPE_3=Custom.
CUSTOM_UNITS _4	37	This is the user entered units that are displayed when UNITS_TYPE_4=Custom.
CUSTOM_UNITS_5	43	This is the user entered units that are displayed when UNITS_TYPE_5=Custom.
CUSTOM_UNITS_6	49	This is the user entered units that are displayed when UNITS_TYPE_6=Custom.
CUSTOM_UNITS_7	55	This is the user entered units that are displayed when UNITS_TYPE_7=Custom.
CUSTOM_UNITS_8	61	This is the user entered units that are displayed when UNITS_TYPE_8=Custom.
DISPLAY_PARAM_SEL	13	This will determine which Display Parameters are active. Bit 0 = DP1 Bit 1 = DP2 Bit 2 = DP3 Bit 3 = DP4 Bit 4 = Bar Graph enable
MODE_BLK	5	The actual, target, permitted, and normal modes of the block.
PARAM_INDEX_1	16	The relative index of DP1 within its block.
PARAM_INDEX_2	22	The relative index of DP2 within its block.
PARAM_INDEX_3	28	The relative index of DP3 within its block.

Parameter	Index	Description
PARAM_INDEX_4	34	The relative index of DP4 within its block.
PARAM_INDEX_5	40	The relative index of DP5 within its block.
PARAM_INDEX_6	46	The relative index of DP6 within its block.
PARAM_INDEX_7	52	The relative index of DP7 within its block.
PARAM_INDEX_8	58	The relative index of DP8 within its block.
ST_REV	1	The revision level of the static data associated with the function block.
STRATEGY	3	The strategy field can be used to identify grouping of blocks.
TAG_DESC	2	The user description of the intended application of the block.
TRANSDUCER_DIRCTORY	9	A directory that specifies the number and starting indicies of the transducers in the transducer block.
TRANSDUCER_TYPE	10	Identifies the transducer that follows.
UNITS_TYPE_1	18	This parameter determines where the units for the display parameter come from.
UNITS_TYPE_2	24	This parameter determines where the units for the display parameter come from.
UNITS_TYPE_3	30	This parameter determines where the units for the display parameter come from.
UNITS_TYPE_4	36	This parameter determines where the units for the display parameter come from.
UNITS_TYPE_5	42	This parameter determines where the units for the display parameter come from.
UNITS_TYPE_6	48	This parameter determines where the units for the display parameter come from.
UNITS_TYPE_7	54	This parameter determines where the units for the display parameter come from.
UNITS_TYPE_8	60	This parameter determines where the units for the display parameter come from.
UPDATE_EVT	7	This alert is generated by any change to the staic data.
XD_ERROR	11	Provides additional error codes related to transducer blocks.

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Model 752

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