Reference Manual
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Rosemount™ 752 Remote Indicator

with FOUNDATION™ Fieldbus protocol

EMERSON™

Contents

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 Emerson™ representative.

⚠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.

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.

⚠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 Emerson Sales Representative.

Section 1 Introduction

1.1 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.

Section A: Reference Data supplies procedure on how to get the specifications, ordering information, and product certification.

Section B: Block Information supplies reference block information such as parameter tables.

1.2 Device description

efore configuring the device, ensure the host has the appropriate Device Description (DD) or Device Type Manager (DTM™) file revision for this device. The device descriptor can be found on Fieldbus.org. The DTM can be found at Emerson.com.

1.3 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.

Section 2 Configuration

2.1 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 33 and the Foundation Fieldbus Block Reference Manual.

2.2 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.

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- 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.

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2.3 Operation and Maintenance of the Rosemount 752

2.3.1 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)

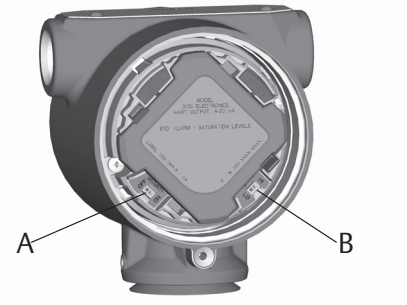
⚠ 1. Set the loop to manual and remove power.

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



A. Security
B. Alarm/simulate

2.3.2 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.

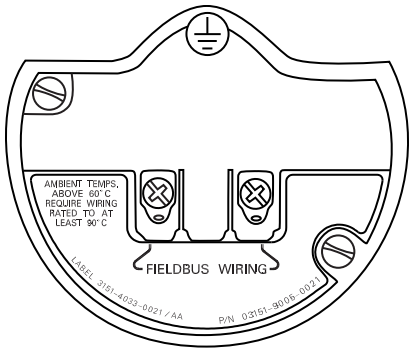
⚠ 2. Connect the power leads to the terminals marked “FIELDBUS WIRING” as shown in Figure 2-2. The power terminals are not polarity sensitive.

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.

⚠ See “Safety messages” on page 3 for complete warning

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

Figure 2-2. Fieldbus Terminal Block



Electrical considerations

Proper electrical Operation and Maintenance 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.

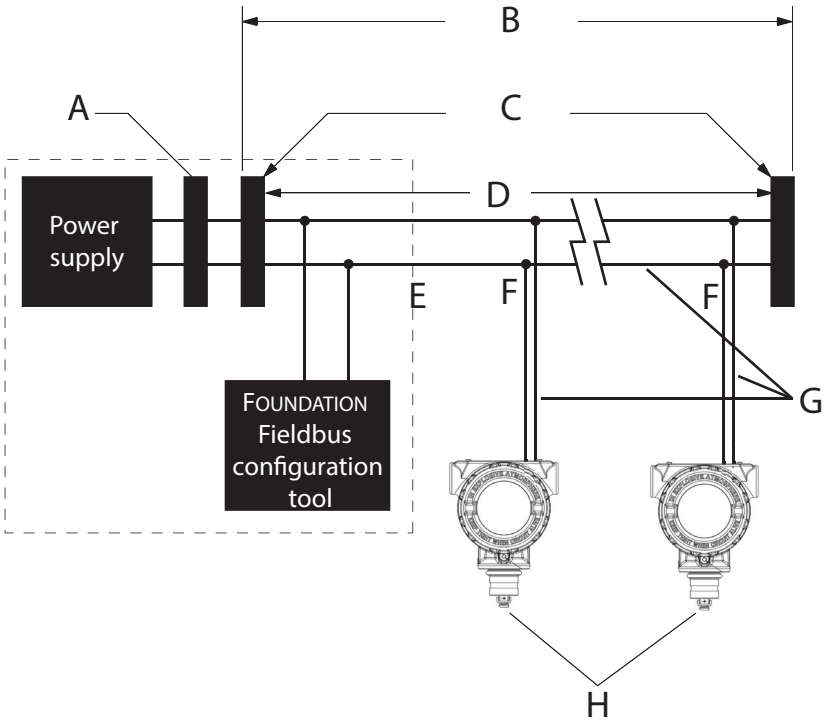
Grounding

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

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



A. Integrated Power Conditioner and Filter
B. 6234 ft. (1900 m) max (depending upon cable characteristics)
C. Terminators
D. Fieldbus segment
E. Trunk[1]
F. Spur
G. Signal wiring
H. Fieldbus devices on segment

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.

1, The power supply, filter, first terminator, and configuration tool are typically located in the control room.

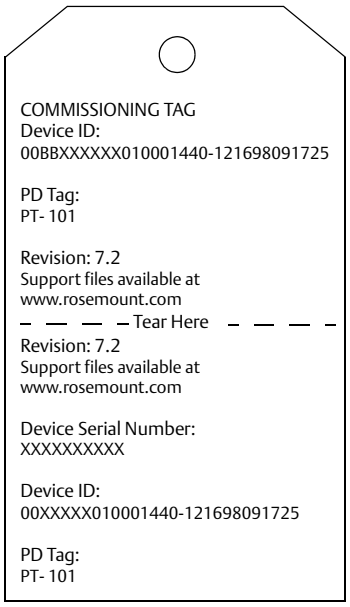
2.4 General considerations

2.4.1 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.



2.5 Hazardous locations

The Rosemount 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.

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.

2.5.1 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 Rosemount 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.

2.6 General block information

2.6.1 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.

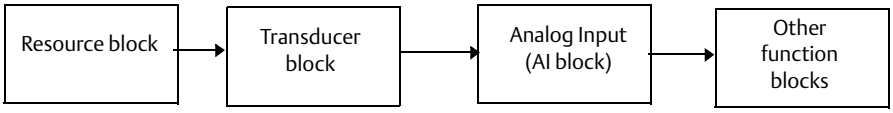
MAN

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 Rosemount 752. For more information, see the Function Block Reference Manual.

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:



2.6.2 Link active scheduler (LAS)

The Rosemount 752 can be designated to act as the backup LAS in the event that the LAS is disconnected from the segment. As the backup LAS, the Rosemount 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 Rosemount 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.

2.6.3 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.

2.6.4 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 = 10 ms
Arithmetic = 10 ms
Input selection = 10 ms
Signal characterizer = 10 ms
Integrator = 10 ms

2.7 FOUNDATION Fieldbus function blocks

For reference information on the LCD Transducer and Advanced Diagnostics Transducer blocks refer to "Foundation Fieldbus Block Information" on Rosemount 3051S Series Pressure Transmitter Family with FOUNDATION Fieldbus protocol" Product Data Sheet available on Emerson.com/Rosemount-3051S. Reference information on the ISEL, INT, ARTH, SGCR and PID blocks can be found in the Function Block Reference Manual.

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 select 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.

2.8 Resource block

2.8.1 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 Rosemount 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)	N/A	1 (unlocked)	Read only	N/A	All
0 (off)	1 (on)	N/A	1 (unlocked)	Read/write	N/A	All
0 (off)	1 (on)	N/A	2 (locked)	Read/write	Physical	Function Blocks only
0 (off)	1 (on)	N/A	2 (locked)	Read/write	Everything	None
1 (on)	0 (off)(1)	0 (unlocked)	1 (unlocked)	Read only	N/A	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.

2.8.2 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.

2.8.3 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.

Alarm	Priority
Electronics failure	1

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 15. The default is 0 and the recommended value are between eight 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 15. The default is zero and the recommended values is three to seven.

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.

Alarm	Priority
LOI failure	1
Check	2

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 15. The default is zero and the recommended values are one or two.

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 connections and sensor connections
Electronics failure	Replace the Fieldbus electronics board

2.8.4 Field diagnostics alerts

The Resource Block will act as a coordinator for Field Diagnostic Alerts. There will be four alarm parameters (FD_FAILED_ALARM, FD_OFFSPEC_ALARM, FD_MAINT_ALARM, and FD_CHECK_ALARM) that will contain information regarding some of the device errors that are detected by the transmitter software. There will be a RECOMMENDED_ACTION parameter that will be used to display the recommended action text for the highest priority alarm and a HEALTH_INDEX parameters (0–100) indicating the overall health of the transmitter. FD_FAILED_ALARM will have the highest priority followed by FD_OFFSPEC_ALARM, FD_MAINT_ALARM and FD_CHECK_ALARM will be the lowest priority.

FD 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 FD_FAILED_ALARMS specifically, they are described below:

FD_FAILED_MAP

FD_FAIL_MAP parameter maps conditions to be detected as active for FD_FAIL_ALARM category. Thus the same condition may be active in all, some, or none of the four alarm categories. Below is a list of the failures with the highest priority first:

Table 2-2. FD Failure Alarms

Alarm	Priority
Electronics failure	1

FD_FAILED_MASK

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

FD_FAILED_PRI

Designates the alerting priority of the FD_FAILED_ALM, see Table B-3 on page 38 The default is zero and the recommended value are between eight and 15.

FD_FAILED_ACTIVE

FD_FAIL_ACTIVE parameter displays the active alarms is active that are being selected for this category. Only the alarm with the highest priority will be displayed. This priority is not the same as the FD_FAILED_PRI parameter described above. This priority is hard coded within the device and is not user configurable.

FD_FAILED_ALM

FD_FAIL_ALM indicates a failure within a device which makes the device non-operational. FD_FAIL_ALM parameter is used primarily to broadcast a change in the associated active conditions, which are not masked, for this alarm category to a Host System.

FD OFFSPEC ALARMS

An offspec alarm indicates that 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 FD OFFSPEC ALARMS, they are described below:

FD_OFFSPEC_MAP

FD_OFFSPEC_MAP parameter maps conditions to be detected as active for FD_ OFFSPEC_ALARM category. Thus the same condition may be active in all, some, or none of the four alarm categories.

FD_ OFFSPEC _MASK

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

FD_ OFFSPEC _PRI

FD_OFFSPEC_PRI designates the alarming priority of the FD_OFFSPEC _ALM, Table B-3 on page 38 The default is zero and the recommended values are three to seven.

FD_ OFFSPEC _ACTIVE

FD_ OFFSPEC _ACTIVE parameter displays the active alarms is active that are being selected for this category. Only the alarm with the highest priority will be displayed. This priority is not the same as the FD_ OFFSPEC _PRI parameter described above. This priority is hard coded within the device and is not user configurable.

FD_ OFFSPEC _ALM

An alarm indicating the device needs maintenance soon. If the condition is ignored, the device will eventually fail. FD_ OFFSPEC _ALM parameter is used primarily to broadcast a change in the associated active conditions, which are not masked, for this alarm category to a Host System.

FD MAINT ALARMS

A maintenance alarm indicates informative conditions that do not have a direct impact on the device's primary function(s).There are five parameters associated with MAINT_ALARMS, they are described below:

FD_MAINT_MAP

The FD_MAINT_MAP parameter contains a list of conditions that do not have a direct impact on the device's primary function(s).

Table 2-3. Maintenance Alarms/Priority Alarm

Failed/maintain/advise active event	Priority
LOI failure	1

FD_MAINT_MASK

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

FD_MAINT_PRI

FD_MAINT_PRI designates the alarming priority of the MAINT_ALM, alarm categories.

FD_ OFFSPEC _MASK

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

FD_ OFFSPEC _PRI

FD_OFFSPEC_PRI designates the alarming priority of the FD_OFFSPEC _ALM, Table B-3 on page 38 The default is zero and the recommended values are three to seven.

FD_ OFFSPEC _ACTIVE

FD_ OFFSPEC _ACTIVE parameter displays the active alarms is active that are being selected for this category. Only the alarm with the highest priority will be displayed. This priority is not the same as the FD_ OFFSPEC _PRI parameter described above. This priority is hard coded within the device and is not user configurable.

FD_ OFFSPEC _ALM

An alarm indicating the device needs maintenance soon. If the condition is ignored, the device will eventually fail. FD_ OFFSPEC _ALM parameter is used primarily to broadcast a change in the associated active conditions, which are not masked, for this alarm category to a Host System.

FD MAINT ALARMS

A maintenance alarm indicates informative conditions that do not have a direct impact on the device's primary function(s).There are five parameters associated with MAINT_ALARMS, they are described below:

FD_MAINT_MAP

The FD_MAINT_MAP parameter contains a list of conditions that do not have a direct impact on the device's primary function(s).

Table 2-4. Maintenance Alarms/Priority Alarm

Failed/maintain/advise active event	Priority
LOI failure	1

FD_MAINT_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.

FD_MAINT_ACTIVE

FD_ MAINT_ACTIVE parameter displays the active alarms is active that are being selected for this category. Only the alarm with the highest priority will be displayed. This priority is not the same as the FD_ MAINT_PRI parameter described above. This priority is hard coded within the device and is not user configurable.

FD_MAINT_ALM

FD_ MAINT_ALM indicates advisory alarms. These conditions do not have a direct impact on the process or device integrity.

FD CHECK 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:

FD_CHECK_MAP

The FD_CHECK_MAP parameter contains a list of informative conditions that do not have a direct impact on the device's primary functions. Below is a list of the advisories with the highest priority first:

Table 2-5. Check Alarms

Alarm	Priority
Check	1

FD_ CHECK _MASK

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

FD_ CHECK _PRI

FD_CHECK _PRI designates the alarming priority of the ADVISE_ALM, seeTable B-3 on page 38. The default is zero and the recommended values is one.

FD_ CHECK _ACTIVE

The FD_CHECK _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 FD_CHECK _PRI parameter described above. This priority is hard coded within the device and is not user configurable.

FD_ CHECK _ALM

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

Recommended actions for field diagnostics alerts

FD_ RECOMMEN _ACT

The FD_RECOMMEN_ACT 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 Field Diagnostics alerts are active. See Table 2-1 on page 16 for more information.

2.9 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 percent 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

2.9.1 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.

Configuration Parameters(1)

DISPLAY_PARAM_SEL

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

BLK_TAG_#(2)

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_XXXX(3)
ISEL_1300_XXXX(3)
CHAR_1400_XXXX(3)
ARITH_1500_XXXX(3)
INTEG_1600_XXXX(3)

BLK_TYPE_#(2)

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_#(2)

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_#(2)

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.

1, *Some host systems may ask for the device's capability level during commissioning. If prompted, the correct value to enter for the Rosemount 752 is 1.*
2, *_# represents the specified parameter number.*
3, *XXXX represents the last 4 digits of the device ID.*

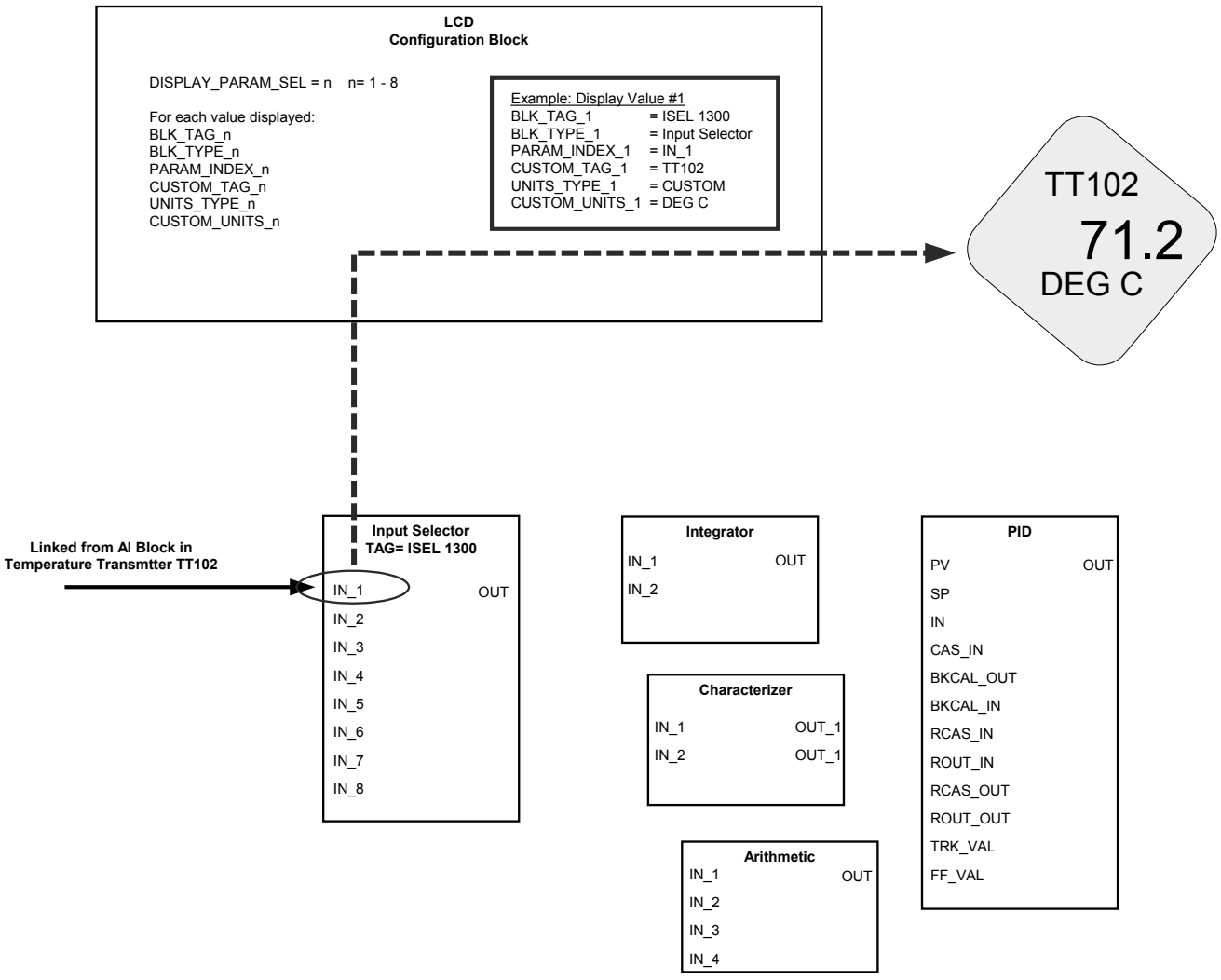
UNITS_TYPE_#(2)

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_#(2)

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.

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



Section 3 Operation and Maintenance

3.1 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 Emerson.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.

3.2 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

⚠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.

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.

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.).

3.3 Resource block

3.3.1 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

3.4 Software upgrade in the field

Software for the Rosemount™ 752 with FOUNDATION™ Fieldbus is easy to upgrade in the field using the FOUNDATION Fieldbus Common Device Software Download procedure.

3.5 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 Safety Data Sheet (SDS) 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.

Section 4 Troubleshooting

4.1 Overview

This section provides summarized troubleshooting suggestions for the most common operating problems. This section contains Rosemount™ 752 Remote Indicator with FOUNDATION™ Fieldbus protocol 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.

4.2 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.

⚠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.

4.3 Troubleshooting guides

Figure 4-1. Rosemount 752 Troubleshooting Flowchart

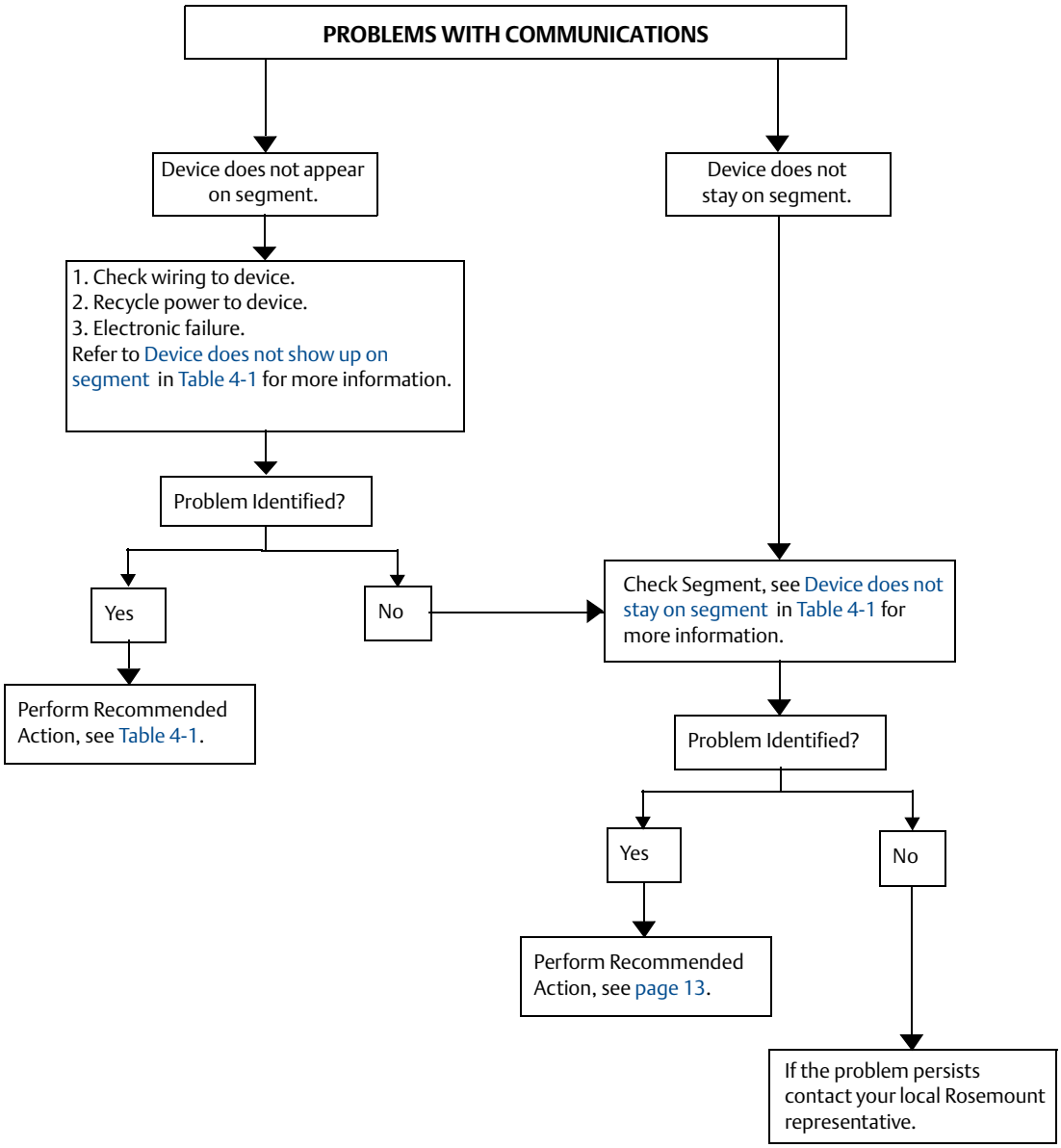


Figure 4-2. Problems with Communications Flowchart

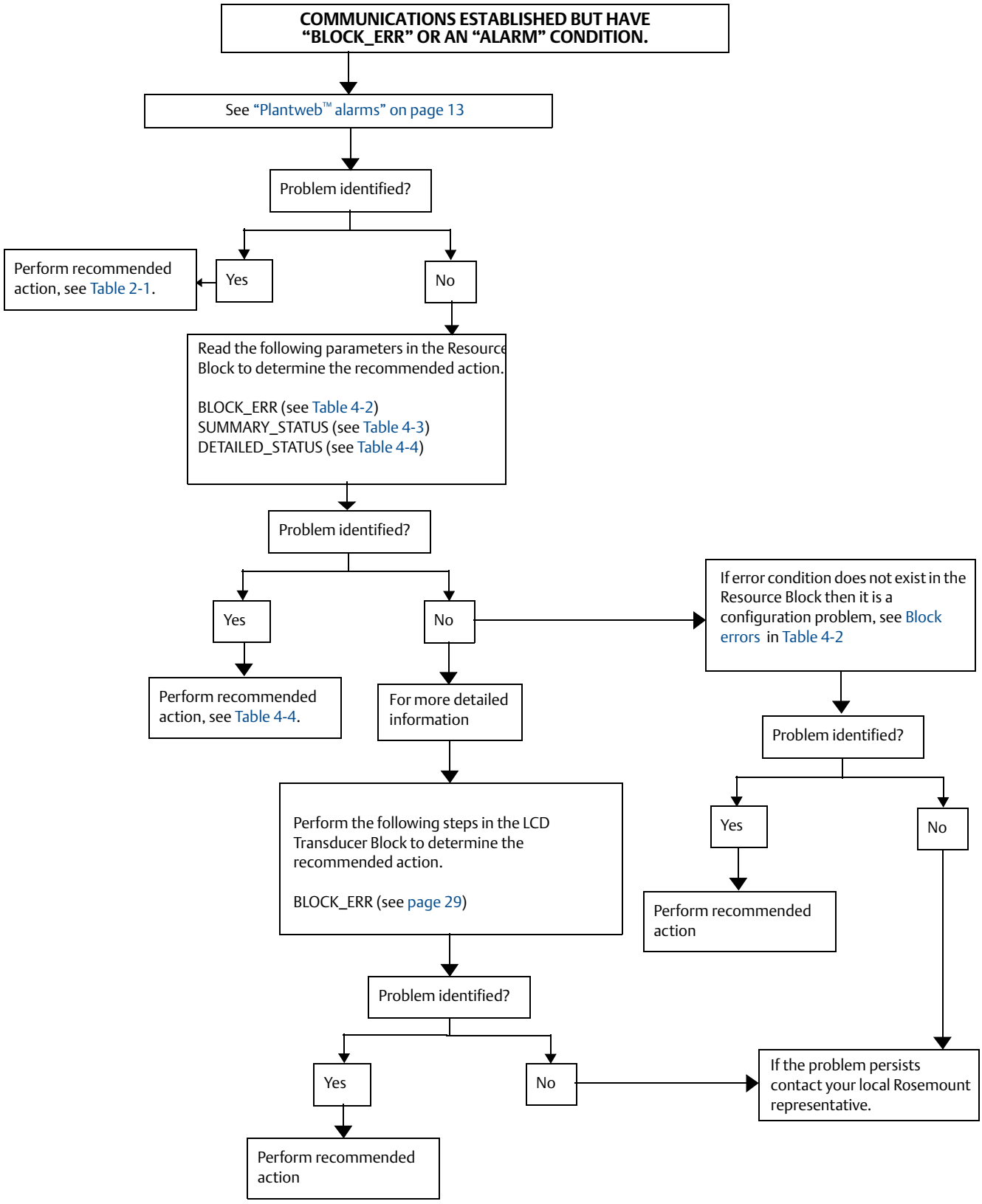


Table 4-1. Troubleshooting guide.

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 9–32 Vdc. 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.

4.4 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 lists conditions reported in the BLOCK_ERR parameter.

Table 4-2. Resource Block BLOCK_ERR Messages

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.
Memory failure: A memory failure has occurred in FLASH, RAM, or EEPROM memory
Device needs maintenance now
Out of service: the actual mode is out of service.

Table 4-3. Resource Block Extended Status (FD_EXTENDED_ACTIVE_1) with Recommended Action Messages

Condition name	Recommended action
LOI error	1. Restart processor 2. Check display connection 3. Call service center
Manufacturing Block integrity error	1. Restart processor 2. Call service center
NV integrity error	1. Restart processor 2. Call service center
ROM integrity error	1. Restart processor 2. Call service center

4.5 LCD transducer block

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

Table 4-4. 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 39.
“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 39.
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 Data

A.1 Block Information

To view current Rosemount™ 752 Remote Indicator Block Information, follow these steps:

1. Go to Emerson.com/Rosemount/Rosemount-752.
2. Scroll as needed to the green menu bar and click **Documents & Drawings**.
3. Click **Manuals & Guides**.
4. Select the appropriate Quick Start Guide.

A.2 Ordering Information, Specifications, and Drawings

To view current Rosemount 752 Remote Indicator Ordering Information, Specifications, and Drawings, follow these steps:

1. Go to Emerson.com/Rosemount/Rosemount-752.
2. Scroll as needed to the green menu bar and click **Documents & Drawings**.
3. For installation drawings, click **Drawings & Schematics** and select the appropriate document.
4. For ordering information, specifications, and dimensional drawings, click **Data Sheets & Bulletins**.
5. Select the appropriate Product Data Sheet.

Appendix B Block Information

B.1 Block configuration

B.1.1 Resource block

The resource block defines the physical resources of the device including type of measurement, memory, etc. The resource block also defines functionality, such as shed times, that is common across multiple blocks. The block has no linkable inputs or outputs and it performs memory-level diagnostics.

Table B-1. Resource Block Parameters

Number	Parameter	Description
01	ST_REV	The revision level of the static data associated with the function block.
02	TAG_DESC	The user description of the intended application of the block.
03	STRATEGY	The strategy field can be used to identify grouping of blocks.
04	ALERT_KEY	The identification number of the plant unit.
05	MODE_BLK	The actual, target, permitted, and normal modes of the block. For further description, see the Mode parameter formal model in FF-890.
06	BLOCK_ERR	This parameter reflects the error status associated with the hardware or software components associated with a block. Multiple errors may be shown. For a list of enumeration values, see FF-890, Block_Err formal model.
07	RS_STATE	State of the function block application state machine. For a list of enumeration values, see FF-890.
08	TEST_RW	Read/write test parameter - used only for conformance testing.
09	DD_RESOURCE	String identifying the tag of the resource which contains the Device Description for the resource.
10	MANUFAC_ID	Manufacturer identification number - used by an interface device to locate the DD file for the resource.
11	DEV_TYPE	Manufacturer's model number associated with the resource - used by interface devices to locate the DD file for the resource.
12	DEV_REV	Manufacturer revision number associated with the resource - used by an interface device to locate the DD file for the resource.
13	DD_REV	Revision of the DD associated with the resource - used by the interface device to locate the DD file for the resource.
14	GRANT_DENY	Options for controlling access of host computer and local control panels to operating, tuning and alarm parameters of the block.
15	HARD_TYPES	The types of hardware available as channel numbers. The supported hardware type is: SCALAR_INPUT
16	RESTART	Allows a manual restart to be initiated. 1. Run: This is passive state of this parameter. 2. Restart resource: To clear up the problems like garbage collection. 3. Restart with defaults: reset all configurable function block application objects to their initial value i.e. their value before any configuration was done by the user. This will also remove appended serial numbers of function block tags 4. Restart processor: provides a way to hit the reset button on the processor associated with the resource. 5. Restart to append serial number: Appends serial number to function block tags. 11. Restart default blocks: defaults manufacturer pre-instantiated blocks.

Table B-1. Resource Block Parameters

Number	Parameter	Description
17	FEATURES	Used to show supported resource block options. The supported features are: SOFT_WRITE_LOCK_SUPPORT, HARD_WRITE_LOCK_SUPPORT, REPORTS, UNICODE, MULTI_BIT_ALARM_SUPPORT and FB_ACTION_RESTART_RELINK
18	FEATURE_SEL	Used to select resource block options.
19	CYCLE_TYPE	Identifies the block execution methods available for this resource. The supported cycle types are: SCHEDULED, and COMPLETION_OF_BLOCK_EXECUTION
20	CYCLE_SEL	Used to select the block execution method for this resource.
21	MIN_CYCLE_T	Time duration of the shortest cycle interval of which the resource is capable.
22	MEMORY_SIZE	Available configuration memory in the empty resource. To be checked before attempting a download.
23	NV_CYCLE_T	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.
24	FREE_SPACE	Percent of memory available for further configuration. Zero in preconfigured resource.
25	FREE_TIME	Percent of the block processing time that is free to process additional blocks.
26	SHED_RCAS	Time duration at which to give up on computer writes to function block RCas locations. Shed from RCas will never happen when SHED_RCAS = 0.
27	SHED_ROUT	Time duration at which to give up on computer writes to function block ROut locations. Shed from ROut will never happen when SHED_ROUT = 0.
28	FAULT_STATE	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.
29	SET_FSTATE	Allows the FAIL_SAFE condition to be manually initiated by selecting Set.
30	CLR_FSTATE	Writing a Clear to this parameter will clear the device FAIL_SAFE if the field condition has cleared.
31	MAX_NOTIFY	Maximum number of unconfirmed notify messages possible.
32	LIM_NOTIFY	Maximum number of unconfirmed alert notify messages allowed.
33	CONFIRM_TIME	The time the resource will wait for confirmation of receipt of a report before trying again. Retry will not happen when CONFIRM_TIME=0.
34	WRITE_LOCK	If set, all writes to static and non-volatile parameters are prohibited, except to clear WRITE_LOCK. Block inputs will continue to be updated.
35	UPDATE_EVT	This alert is generated by any change to the static data.
36	BLOCK_ALM	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.
37	ALARM_SUM	The current alert status, unacknowledged states, unreported states, and disabled states of the alarms associated with the function block.
38	ACK_OPTION	Selection of whether alarms associated with the block will be automatically acknowledged.
39	WRITE_PRI	Priority of the alarm generated by clearing the write lock.
40	WRITE_ALM	This alert is generated if the write lock parameter is cleared.
41	ITK_VER	Major revision number of the interoperability test case used in certifying this device as interoperable. The format and range are controlled by the fieldbus FOUNDATION.
42	FD_VER	This parameter's value equals the value of the major version of the Field Diagnostics specification that this device was designed to.
43	FD_FAIL_ACTIVE	Reflects the error conditions that are being detected as active as selected for this category. It is a bit string, so that multiple conditions may be shown.
44	FD_OFFSPEC_ACTIVE	Reflects the error conditions that are being detected as active as selected for this category. It is a bit string, so that multiple conditions may be shown.
45	FD_MAINT_ACTIVE	Reflects the error conditions that are being detected as active as selected for this category. It is a bit string, so that multiple conditions may be shown.

Table B-1. Resource Block Parameters

Number	Parameter	Description
46	FD_CHECK_ACTIVE	Reflects the error conditions that are being detected as active as selected for this category. It is a bit string, so that multiple conditions may be shown.
47	FD_FAIL_MAP	Maps conditions to be detected as active for this alarm category. Thus the same condition may be active in all, some, or none of the 4 alarm categories.
48	FD_OFFSPEC_MAP	Maps conditions to be detected as active for this alarm category. Thus the same condition may be active in all, some, or none of the 4 alarm categories.
49	FD_MAINT_MAP	Maps conditions to be detected as active for this alarm category. Thus the same condition may be active in all, some, or none of the 4 alarm categories.
50	FD_CHECK_MAP	Maps conditions to be detected as active for this alarm category. Thus the same condition may be active in all, some, or none of the 4 alarm categories.
51	FD_FAIL_MASK	Allows the user to suppress any single or multiple conditions that are active, in this category, from being broadcast to the host through the alarm parameter. A bit equal to '1' will mask i.e. inhibit the broadcast of a condition, and a bit equal to '0' will unmask i.e. allow broadcast of a condition.
52	FD_OFFSPEC_MASK	Allows the user to suppress any single or multiple conditions that are active, in this category, from being broadcast to the host through the alarm parameter. A bit equal to '1' will mask i.e. inhibit the broadcast of a condition, and a bit equal to '0' will unmask i.e. allow broadcast of a condition.
53	FD_MAINT_MASK	Allows the user to suppress any single or multiple conditions that are active, in this category, from being broadcast to the host through the alarm parameter. A bit equal to '1' will mask i.e. inhibit the broadcast of a condition, and a bit equal to '0' will unmask i.e. allow broadcast of a condition.
54	FD_CHECK_MASK	Allows the user to suppress any single or multiple conditions that are active, in this category, from being broadcast to the host through the alarm parameter. A bit equal to '1' will mask i.e. inhibit the broadcast of a condition, and a bit equal to '0' will unmask i.e. allow broadcast of a condition.
55	FD_FAIL_ALM	Used primarily to broadcast a change in the associated active conditions, which are not masked, for this alarm category to a Host System.
56	FD_OFFSPEC_ALM	Used primarily to broadcast a change in the associated active conditions, which are not masked, for this alarm category to a Host System.
57	FD_MAINT_ALM	Used primarily to broadcast a change in the associated active conditions, which are not masked, for this alarm category to a Host System.
58	FD_CHECK_ALM	Used primarily to broadcast a change in the associated active conditions, which are not masked, for this alarm category to a Host System.
59	FD_FAIL_PRI	Allows the user to specify the priority of this alarm category.
60	FD_OFFSPEC_PRI	Allows the user to specify the priority of this alarm category.
61	FD_MAINT_PRI	Allows the user to specify the priority of this alarm category.
62	FD_CHECK_PRI	Allows the user to specify the priority of this alarm category.
63	FD_SIMULATE	Allows the conditions to be manually supplied when simulation is enabled. When simulation is disabled both the diagnostic simulate value and the diagnostic value track the actual conditions. The simulate jumper is required for simulation to be enabled and while simulation is enabled the recommended action will show that simulation is active.
64	FD_RECOMMEN_ACT	A device enumerated summarization of the most severe condition or conditions detected. The DD help should describe by enumerated action, what should be done to alleviate the condition or conditions. 0 is defined as Not Initialized, 1 is defined as No Action Required, all others defined by manufacturer.
65	FD_EXTENDED_ACTIVE_1	An optional parameter or parameters to allow the user finer detail on conditions causing an active condition in the FD_*_ACTIVE parameters.
66	FD_EXTENDED_MAP_1	An optional parameter or parameters to allow the user finer control on enabling conditions contributing to the conditions in FD_*_ACTIVE parameters.
67	COMPATIBILITY_REV	Optionally used when replacing field devices. The correct usage of this parameter presumes the COMPATIBILITY_REV value of the replacing device should be equal or lower than the DEV_REV value of the replaced device.
68	HARDWARE_REVISION	Manufacturer hardware revision
69	SOFTWARE_REV	Manufacturer hardware revision

Table B-1. Resource Block Parameters

Number	Parameter	Description
70	PD_TAG	PD tag description of device
71	DEV_STRING	Used to load new licensing into the device. The value can be written but will always read back with a value of 0.
72	DEV_OPTIONS	Indicates which miscellaneous and diagnostic device licensing options are enabled. It also indicates Transducer options.
73	OUTPUT_BOARD_SN	Output board serial number
74	FINAL_ASSY_NUM	Same final assembly number placed on the neck label
75	DOWNLOAD_MODE	Gives access to the boot block code for over the wire downloads
76	HEALTH_INDEX	Parameter shall be set based on the active FD alarms or PWA alarms. HEALTH_INDEX will show 100 if target mode of block is OOS or there are no active alarms in device. The table below represents HEALTH_INDEX value when FD or PWA alarms are active in a device.
77	FAILED_PRI	Designates the alarming priority of the FAILED_ALM and also used as switch b/w FD and legacy PWA. If value is greater than or equal to 1 then PWA alerts will be active in device else device will have FD alerts.
78	RECOMMENDED_ACTION	Enumerated list of recommended actions displayed with a device alert
79	FAILED_ALM	Alarm indicating a failure within a device which makes the device non-operational
80	MAINT _ALM	Alarm indicating the device needs maintenance soon. If the condition is ignored, the device will eventually fail.
81	ADVISE _ALM	Alarm indicating advisory alarms. These conditions do not have a direct impact on the process or device integrity.
82	FAILED_ENABLE	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. This parameter is the Read Only copy of FD_FAIL_MAP.
83	FAILED_MASK	Mask of Failure Alarm. Corresponds bit for bit to the FAILED_ACTIVE. A bit on means that the failure is masked out from alarming. This parameter is the Read Only copy of FD_FAIL_MASK.
84	FAILED_ACTIVE	Enumerated list of failure conditions within a device. All open bits are free to be used as appropriate for each specific device.This parameter is the Read Only copy of FD_FAIL_ACTIVE.
85	MAINT_PRI	Designates the alarming priority of the MAINT_ALM
86	MAINT_ENABLE	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.This parameter is the Read Only copy of FD_OFFSPEC_MAP.
87	MAINT_MASK	Mask of Maintenance Alarm. Corresponds bit for bit to the MAINT_ACTIVE. A bit on means that the failure is masked out from alarming.This parameter is the Read Only copy of FD_OFFSPEC_MASK.
88	MAINT_ACTIVE	Enumerated list of maintenance conditions within a device. All open bits are free to be used as appropriate for each specific device. This parameter is the Read Only copy of FD_OFFSPEC_ACTIVE.
89	ADVISE_PRI	Designates the alarming priority of the ADVISE_ALM
90	ADVISE_ENABLE	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.This parameter is the Read Only copy of FD_MAINT_MAP & FD_CHECK_MAP.
91	ADVISE_MASK	Mask of Advisory Alarm. Corresponds bit for bit to the ADVISE_ACTIVE. A bit on means that the failure is masked out from alarming.This parameter is the Read Only copy of FD_MAINT_MASK & FD_CHECK_MASK.
92	ADVISE_ACTIVE	Enumerated list of advisory conditions within a device. All open bits are free to be used as appropriate for each specific device. This parameter is the Read Only copy of FD_MAINT_ACTIVE & FD_CHECK_ACTIVE.
93	DEVICE_INFO	Group of device specific informational parameters – software download class, address, and maximum current.
94	SWITCHES_STATE	The state of hardware simulation and write lock security switches.

Block errors

The table below lists conditions reported in the BLOCK_ERR parameter.

Table B-2. BLOCK_ERR Conditions

Number	Name and description
0	Other
1	Block Configuration Error: A feature in CYCLE_SEL is set that is not supported by CYCLE_TYPE.
3	Simulate Active: This indicates that the simulation jumper is in place. This is not an indication that the I/O blocks are using simulated data.
6	Device needs maintenance soon
7	Input failure/process variable has bad status
9	Memory Failure: A memory failure has occurred in FLASH, RAM, or EEPROM memory.
10	Lost Static Data: Static data that is stored in non-volatile memory has been lost.
11	Lost NV Data: Non-volatile data that is stored in non-volatile memory has been lost.
13	Device Needs Maintenance Now
14	Power Up: The device was just powered-up.
15	OOS: The actual mode is out of service.

Modes

The resource block supports two modes of operation as defined by the MODE_BLK parameter:

Automatic (Auto)

The block is processing its normal background memory checks.

Out of service (OOS)

The block is not processing its tasks. When the resource block is in OOS, all blocks within the resource (device) are forced into OOS. The BLOCK_ERR parameter shows Out of Service. In this mode, changes can be made to all configurable parameters. The target mode of a block may be restricted to one or more of the supported modes.

Alarm detection

A block alarm will be generated whenever the BLOCK_ERR has an error bit set. The types of block error for the resource block are defined above. A write alarm is generated whenever the WRITE_LOCK parameter is cleared. The priority of the write alarm is set in the following parameter:

- WRITE_PRI

Table B-3. Alarm Priority Levels

Number	Description
0	The priority of an alarm condition changes to 0 after the condition that caused the alarm is corrected.
1	An alarm condition with a priority of 1 is recognized by the system, but is not reported to the operator.
2	An alarm condition with a priority of 2 is reported to the operator, but does not require operator attention (such as diagnostics and system alerts).
3-7	Alarm conditions of priority 3 to 7 are advisory alarms of increasing priority.
8-15	Alarm conditions of priority 8 to 15 are critical alarms of increasing priority.

Status handling

There are no status parameters associated with the resource block.

B.2 LCD transducer block

Parameter	Index	Description
ALERT_KEY	4	The identification number of the plant unit.
BLK_TAG_1	16	The tag of the block containing DP1.
BLK_TAG_2	22	The tag of the block containing DP2.
BLK_TAG_3	28	The tag of the block containing DP3.
BLK_TAG_4	34	The tag of the block containing DP4.
BLK_TAG_5	40	The tag of the block containing DP5.
BLK_TAG_6	46	The tag of the block containing DP6.
BLK_TAG_7	52	The tag of the block containing DP7.
BLK_TAG_8	58	The tag of the block containing DP8.
BLK_TYPE_1	15	The enumerated block type for DP1's block.
BLK_TYPE_2	21	The enumerated block type for DP2's block.
BLK_TYPE_3	27	The enumerated block type for DP3's block.
BLK_TYPE_4	33	The enumerated block type for DP4's block.
BLK_TYPE_5	39	The enumerated block type for DP5's block.
BLK_TYPE_6	45	The enumerated block type for DP3's block.
BLK_TYPE_7	51	The enumerated block type for DP7's block.
BLK_TYPE_8	57	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	13	A directory that specifies the number, starting indicies, and DD Item ID's of the data collections in each transducer block.
CUSTOM_TAG_1	18	The block description that is displayed for DP1.
CUSTOM_TAG _2	24	The block description that is displayed for DP2.
CUSTOM_TAG _3	30	The block description that is displayed for DP3.
CUSTOM_TAG _4	36	The block description that is displayed for DP4.
CUSTOM_TAG_5	42	The block description that is displayed for DP5.
CUSTOM_TAG_6	48	The block description that is displayed for DP6.
CUSTOM_TAG_7	54	The block description that is displayed for DP7.
CUSTOM_TAG_8	60	The block description that is displayed for DP8.
CUSTOM_UNITS_1	20	This is the user entered units that are displayed when UNITS_TYPE_1=Custom.
CUSTOM_UNITS _2	26	This is the user entered units that are displayed when UNITS_TYPE_2=Custom.
CUSTOM_UNITS _3	32	This is the user entered units that are displayed when UNITS_TYPE_3=Custom.
CUSTOM_UNITS _4	38	This is the user entered units that are displayed when UNITS_TYPE_4=Custom.

Parameter	Index	Description
CUSTOM_UNITS_5	44	This is the user entered units that are displayed when UNITS_TYPE_5=Custom.
CUSTOM_UNITS_6	50	This is the user entered units that are displayed when UNITS_TYPE_6=Custom.
CUSTOM_UNITS_7	56	This is the user entered units that are displayed when UNITS_TYPE_7=Custom.
CUSTOM_UNITS_8	62	This is the user entered units that are displayed when UNITS_TYPE_8=Custom.
DISPLAY_PARAM_SEL	14	This will determine which Display Parameters are active. Bit 0 = DP1 Bit 1 = DP2 Bit 2 = DP3 Bit 3 = DP4 Bit 4 = DP5 Bit 5 = DP6 Bit 6 = DP7 Bit 8 = DP8
MODE_BLK	5	The actual, target, permitted, and normal modes of the block.
PARAM_INDEX_1	17	The relative index of DP1 within its block.
PARAM_INDEX_2	23	The relative index of DP2 within its block.
PARAM_INDEX_3	27	The relative index of DP3 within its block.
PARAM_INDEX_4	35	The relative index of DP4 within its block.
PARAM_INDEX_5	41	The relative index of DP5 within its block.
PARAM_INDEX_6	47	The relative index of DP6 within its block.
PARAM_INDEX_7	53	The relative index of DP7 within its block.
PARAM_INDEX_8	59	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	19	This parameter determines where the units for the display parameter come from.
UNITS_TYPE_2	25	This parameter determines where the units for the display parameter come from.
UNITS_TYPE_3	31	This parameter determines where the units for the display parameter come from.
UNITS_TYPE_4	37	This parameter determines where the units for the display parameter come from.
UNITS_TYPE_5	43	This parameter determines where the units for the display parameter come from.
UNITS_TYPE_6	49	This parameter determines where the units for the display parameter come from.
UNITS_TYPE_7	55	This parameter determines where the units for the display parameter come from.
UNITS_TYPE_8	61	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	12	Provides additional error codes related to transducer blocks.
TRANSDUCER_TYPE_VER	11	Version of transducer identified by TRANSDUCER_TYPE

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