

APPLICATION NOTE

INTRODUCING SMARTSCAN & MONOSCAN ERROR SIGNAL CONFIGURATION

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Table of Contents

1.	Scope	3
2.	objectives.....	3
3.	error signal.....	3
3.1	SmartScan 4-20mA signal error messages.....	4
3.1.1	4-20mA output	5
3.2	MonoScan Implementation	6
3.2.1	Error messages list:	6
3.2.2	4-20mA output	7

1. SCOPE

This document defines the configuration procedure of **SmartScan** and **MonoScan** units for error status indication in the 4-20mA output.

2. OBJECTIVES

- Familiarize the user with configuring the **SmartScan** unit to support error status indication via the 4-20mA output.
- Familiarize the user with configuring the **MonoScan** unit to support error status indication via the 4-20mA output.
- Familiarize the user with the different error status mode, generating error signals messages.
- Familiarize the user with the different 4-20mA output, for each configuration.

3. ERROR SIGNAL

Error signal feature is a special analog current that alerts the user on failure or non-normal operation of the SmartScan or MonoScan unit.

As level gauge instruments use the standard analog current between 4 to 20mA to indicate the level information, the error signal current value must be either lower than 4mA, or higher than 20mA.

Since MonoScan is a two-wire device, 4mA is the minimum current for normal working condition and therefore 3.7mA error indication is not applicable.

For SmartScan units, error signal can be **either** 3.7mA **–or–** 22mA as these are four-wire units and low-current consumption is not an obstacle.

In some cases, one may find a controller that does not support an analog current that is lower than 4mA or higher than 20mA. Hence, in these cases one **must** disable the error signal indication.

3.1 SMARTSCAN 4-20mA SIGNAL ERROR MESSAGES

General:

In previous SmartScan versions, errors were alerted only by displaying an error message according to the list of errors presented in the SmartScan user manual.

The new SmartScan version enables the user to use current signaling to present an error on the 4-20mA and on the SmartScan display. Such option is highly popular in applications where the user wants to view errors from a remote station (depending on the capability of the remote station to support this current signaling).

Implementation:

New configuration program, **<Pr.6>**, added under the **<Additional menu>**.

Under **<Pr.6>** the user can set one of the following legal values:

- 0 – Enables 22mA error current signaling.
- 1 – Enables 3.7mA error current signaling.
- 2 – Disables error current signaling.

Error messages will appear on screen in the following cases:

Near Zone – 'FFFFF' message appears on the SmartScan screen indicating that the measured level is below the defined dead zone.

Lost Echo – 'EEEEEE' message appears on the SmartScan screen, indicating that the level is below the configured 4mA value or that the echo is lost.


Tank Empty – 'EEEEEE' appears on screen indicating that the measured distance is higher than the configured tank height (this is typical to tanks with conical ending).

Noises/Interferences – 'AUTO' blinking, followed by inaccurate reading appears on screen, indicating that there are noises or other interferences in the unit surroundings. The noise/interference is causing disturbances to the measurement procedure.

ⓘ Note!

Auto blinking indicates the presence of acoustic interferences. However, SmartScan will continue measuring, while indicating the actual level/distance/flow of the measured material.

3.1.1 4-20mA output

Condition	Error signal disabled	Error signal enabled
Loss of echo or the measurement value is higher than the tank height (EEEE).	Unit output = 4mA.	Unit output 22mA – or- 3.7mA (based on user configuration of Pr.06 in the Additional Menu,).
Near dead zone (FFFF). Target is located within the unit's dead-zone.	Unit output = 20mA.	
 Icon during measurement mode – indicates acoustic problems.	Unit output 4-20mA based on the liquid/solid level in the tank.	

ⓘ Note!

When error signal is enabled, either 3.7mA or 22mA, (based on Pr. 6 configuration) is activated acoustic interferences are present.

3.2 MONOSCAN IMPLEMENTATION

As the MonoScan is a 2-wire unit, error signal notification may be obtained only by 22mA output.

Implementation:

Enter the Function Menu by pressing simultaneously **<Ent>** and **<Esc>**. Select Pr. 02 Tank Height function in the function menu. Enter the access code 00.16 to define the error signal mode. The following options are available:

E000 - Error signal enabled.

d000 - Error signal disabled.

3.2.1 Error messages list:

Near Zone – 'FFFFF' message appears on the SmartScan screen indicating that the measured level is below the defined dead zone.

Lost Echo – 'EEEE' message appears on the SmartScan screen, indicating that the level is below the configured 4mA value or that the echo is lost.

Tank Empty – 'EEEE' appears on screen indicating that the measured distance is higher than the configured tank height (this is typically to tank with conical ending).

Err. EC11 – Noise – indicating that there are noises or other interferences in the unit surroundings. The Noise/Interference is causing disturbances to the measurement procedure.

Err. E555 – Indicating faulty power supply.

8818 - Any combination of there 8s and one 1 indicate a button pressed to long.

3.2.2 4-20mA output

Condition	Error signal disabled	Error signal enabled
Loss of echo or the measurement value is higher than the tank height (EEEE).	Unit output = 4mA.	Unit output should be 22mA.
Near dead zone (FFFF). Target is located within the unit's dead-zone.	Unit output = 20mA.	
Err. EC11 – Noise.	Unit 4-20mA output as configured under Pr.4 and Pr.5 and represents current measured value.	
Err. 5544 – Sensor disconnected.		
Err. E555 – Power supply problem.		
A combination of three 8 and one 1 - either due to shortage or when two pads pushed simultaneously.		

ⓘ Note!

When error signal is enabled, 22mA, is activated acoustic interferences are present.