APPLICATION NOTE

INTRODUCING SMARTSCAN NEW FEATURES

Revision Record:

Date	Description	Written by	Rev.
11/15/2003	Initial release	Amit Gelber	1.03

Table of Contents

1. SCOPE

This document introduces new features included in the new versions of the SmartScan.

SmartScan type	Previous version	New version
SmartScan25	v2.04	v2.05
SmartScan50	v5.03	V5.04 - 5.06

The first part of this document will introduce new SW features included in both SmartScan 25 and 50.
The second part will introduce new SW features currently available in SmartScan 50 only.

2. OBJECTIVES

- Familiarize the user with new features of the SmartScan and their implementation.
- Familiarize the user with SmartScan configuration changes.
- Familiarize the user with 4-20mA signal error messages.
- Familiarize the user new open-channel flumes coding.
- Familiarize the user with new totalization features.
- Familiarize the user with new display indication options.
- Familiarize the user with new advanced relay configuration features.

3. NEW SMARTSCAN FEATURES

Part I – describes a list of new features that were implemented in both SmartScan 25 V2.05 and SmartScan50 V5.04 SW versions:

1. **4-20mA Signal Error messages:** an option to alert on signal errors via the 4-20mA current output using a current of 22mA or 3.7mA.
2. **Open Channel standard:** an option to choose between American or European flumes/weirs standards.
3. **New Flow Totalization feature:** Enables storing last flow totalization value in memory and resetting totalization value.

Part II – describes new SW features currently available only for SmartScan 50 5.06 SW versions:

4. **Display Indication options:** enable toggling between various display indications modes.
5. **Advanced Relay configuration:** an option to configure relays operation to level, distance or flow modes (currently available in SmartScan50 only).

3.1 PART I – NEW SW FEATURES FOR SW VERSIONS 2.05 AND 5.04 OF SMARTSCAN 25 AND 50 (RESPECTIVALY)

3.1.1 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 will be displayed on the SmartScan screen indicating that the measured level is below the defined dead zone.

Lost Echo – '**EEEEE**' message will be displayed on the SmartScan screen, indicating that the level is below the configured 4mA value or that the echo is lost.

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

Noises/Interferences – 'AUTO' followed by inaccurate reading will appear on screen, indicating that there are noises or other interferences in the unit surroundings that are causing disturbances to the measurement procedure.

3.1.2 OPEN CHANNEL STANDARDS

General:
There are more than few differences between American and European open channel standards. These differences happen as a result of:

1. Different popularity of flumes/weirs types.
2. Different measurement system (meter/feet; M^3/GPM).

Solid AT implemented this option to enable the user to set the unit to either American or European standard. This option provides approximately 17 different predefined types of flumes/weirs already implemented in the SmartScan memory, which shortens installation time and setup procedure. Once the user selects the desired standard, the **parsh.flum** coding of flume/weir type and dimensions will be according to the standard he has chosen.

Implementation:
Consult your local provider to modify the open channel standard from the one currently defined in your SmartScan unit.

ⓘ Note!
The user on screen indication symbol will be:

- Predefined open channel, American standard: **XU.YY**.
- Predefined open channel, European standard: **XE.YY**.

'X' stands for the flume/weir type and 'YY' stands for the flume/weir dimensions, as described in the user manual.

3.1.3 NEW FLOW TOTALIZATION FEATURES

General:
Enabling the totalization mode in SmartScan allows the user to view the actual amount of flow in real time updated every 30 seconds.
In the previous SmartScan version the totalization value was not stored in memory and could have been lost in case of power failure.
In the new SmartScan version the total accumulative totalization value is stored in memory from the point of activating this mode, and can be retrieved in case of power failure.

Implementation:
This feature has been implemented under **<Pr.0>**, in the <**Additional menu>**.
Until now, setting the totalization mode in SmartScan models was done by selecting **<Ind2>**.
In the new SmartScan SW version, the following options are definable under **<Ind2>**:

0 – Reset totalization.
1 – Activate totalization.
2 – Deactivate totalization.

Totalization values are shown in two separate screens for high and low numbers. High (large) numbers are indicated by H followed by the first five digits of the value; low (small) numbers are indicated by L followed by the last four digits of the value. Toggling between these screens using **<NEXT>** or **<BACK>** buttons allowa the user to view the different totalization values.
For example, if the total flow is 147,521 gallons, the user will see 'H00001' in the high numbers screen and 'L47521' in the low numbers screen.

3.2 PART II – NEW SW FEATURES AVAILABLE ONLY FOR SMARTSCAN 50 5.06V

3.2.1 DISPLAY INDICATION OPTIONS

General:
In the past, when setting the SmartScan unit for a certain indication mode, the user could view measurement results only in the selected indication mode. This new SW version enables the user to view obtained measurement results in various types of indication modes. For example, if the user sets the SmartScan unit for distance, he will be able to obtain measurement results in either distance or level.

The table below describes the optional indication modes available:

Indication	Indication Toggle Option
Distance/Level	Distance/Level
Flow	Flow/Level/Distance
Totalization	Totalization(High)/Totalization (Low)/Distance/Flow
Volume	Volume/Level/Distance

Implementation:
In the main menu move to <**Indication Modes**> select the desired indication and exit the main menu. On the SmartScan default screen, use <**NEXT>** button to toggle between indication modes.
For example, if the user sets the SmartScan unit for volume, the default screen will display the current volume value. By pressing <**NEXT**> button once, he will be able to view measurement results in Level values, pressing **<NEXT>** once again will display measurement results in Distance values.

ⓘ **Note!**
The display will return to the default indication mode after 30 seconds.

3.2.2 ADVANCED RELAYS CONFIGURATION

General:
In the new SmartScan50 SW version user can configure relays operation to level, distance, flow, volume and totalization values.
Default operation mode for relay configuration is always level, but the user can change it to work with other modes as described above.

Here are the optional relays set-up modes:

	Non Flow Application			Flow Application	
Indication Mode	Dist.	Level	Vol.	Flow	Totalization
Relay Mode	Dist., Level		Vol.	Flow, Dist., Level	Flow, Total.

For example, when the indication mode is configured for distance or level, the user will be able to configure relay operation values for either distance or level units. When the indication mode is configured for flow values, the user will be able to configure relay operation values for flow, distance or level values.

In addition, relay 4 and 5 can be configured to perform other tasks in addition to the normal relay settings.

- Relay 4 can be configured to activate an alarm in case the unit produces inaccurate measurement results due to an electrical failure or acoustic problem.
- Relay 5 can be configured for flow totalization pulse indication. This option enables the user to receive a pulse indication from the relay per X m^3/gallons of flow.

Implementation:
Option to enter parameters in each of the modes: Level/Distance/Flow.
If flow indication mode was selected, relays can be configured to Level/Distance/Flow values.
After selecting the relays mode (Level/Distance/Flow) the user will be able to configure Open/Close relays modes.

Optionally, the user can configure relay 4 to report errors. The relay will be closed and 'EEEEE' message will appear on screen in case of lost echo or if measurement results are higher than tank height. 'FFFFF' message will be appear on screen in case of near dead zone.

In addition, the can configure relay 5 for flow totalization pulse indication. The flow value can be selected from a list of optional values from 1 to 100,000. An electrical pulse will be generated whenever the relay total value will be greater than the value selected from the list. The user can also define a pulse width between 20 to 2000ms with a resolution of 10ms.

For example, a pulse with duration of 1000ms will be generated each time the value of flow will reach 10,000m³ (if the value that was selected from the optional values list is, 10,000).

ⓘ Note!

For safety reasons, relays operational values will reset when the following occurs:

- Change of 'tank height'.
- Change of measuring mode from Level/Distance to Flow and vice versa.
- Change of Relays mode: Level/Distance/Flow.
- Change of flume type in Flow mode
- Change from solid to liquid mode
- Change of measurement units

4. RELAYS CONFIGURATION EXAMPLES

➢ To set the relay values for level or distance:

	Press / Action	Display	Explanation
⇨	ENT. to enter relay setup.	RELAY	With the **RELAY** icon flashing.
⇨	ENT. to assign an indication mode for the relays.	dISt LEUEL	Choose the desired relay configuration mode: **Level**, **Distance**, **Flow**, **Totalization** or **volume**. Use the **NEXT** button to toggle between indication modes and **ENT**. to select the mode (refer to the *Relay Setup Options* table) .
⇨	ENT. to enter open mode.	OPE.n and 1	Enters the open values mode of the relay setup. The appropriate relay number flashes throughout the process of defining values for that relay.
⇨	ENT. or ESC. BACK or NEXT	000.000	Displays 0 or the previously entered relay value.
⇨	ENT. to enter values for the relay.	002.000	Use to enter the relay value.

	Press / Action	Display	Explanation
⇨	Press ENT. at the end of entering a value for relay 1, to enter close value parameters.	CLO.SE and 1	Enters close values mode of the relay setup. Enter and save the close values in the same way as described above for the open values.
⇨	Press ENT. on the far-right digit to save the value.	OPE.n and 2	Repeat the previous steps to set an open/close values for each relay to be used. (If you do not want to set a value for every relay, use the **Esc** button to exit the relays set-up mode.)

Relays values can be configured in two separate screens when set to flow, similar to volume mode configuration (after setting the SmartScan unit to **FLOW** in the indication mode menu).

➢ **To set the relay values for flow:**

	Press / Action	Display	Explanation
⇨	ENT. to enter relay setup.	RELAY	With the **RELAY** icon flashing.
⇨	ENT. to assign an indication mode.	FLOuu	Choose FLOW from the optional modes, and press ENT.
⇨	BACK or NEXT	For example, 1 and OPEn	Select the relay number you wish to configure, using NEXT and BACK buttons and press ENT. Select OPEN and press ENT.
⇨	ENT.	H00001	This screen allows you to enter up to four digits of High numbers of flow values.
⇨	ENT.	For example, L20.000	Use this screen to enter Low numbers of up to five digits of flow values.
⇨	ENT.	CLOSE	Enter relay values for Close mode, as described above for Open mode.

As shown in the above example, relay values were configured in the following way: 1 was entered in the high numbers H=1 and 20,000 was entered in the low numbers L=20,000 which mean a total value of 120,000 gallons.

Configuring relays for volume mode is done in a similar way, however "Vol" Uol should be selected instead of "Flouu" FLOuu.

Setting relay 4 to report errors

This mode enables you to use relay 4 as a trigger to activate an alarm or siren in case the unit produces inaccurate measurement results due to an electrical failure or acoustic problem. You can configure relay 4 to report errors or to remain in normal set-up mode.
The relay will remain in Open mode as long as the unit displays proper measurement values.

➢ **To set relay 4 for error report:**

	Press / Action	Display	Explanation
⇨	BACK or NEXT	OPE.n	Move to relay 4 using NEXT or BACK buttons and ENT. to enter the relay mode.
⇨	ENT.	Err En Err dS	Choose Err En to enable error alert option, or Err dS to disable this option.

Setting relay 5 for flow totalization pulse indication

You can choose to set relay number 5 for flow totalization pulse indication or to remain in normal set-up mode. This option enables you to reserve the accumulated value gathered by the unit, by using an external counter.

➢ **To set relay 5 for pulse indication:**

	Press / Action	Display	Explanation
⇨	ENT. or ESC. BACK or NEXT	OPEn CLOSE	Move to relay 5 using NEXT or BACK buttons and ENT. to enter the desired operation mode.
⇨	ENT. to select enable or disable mode.	tOt En tOt dS	Choose tot En to enable pulse indication option or tot-ds to disable this option.
⇨	ENT. to select a pulse value from the list.	010 000 For example, 10,000m³.	Select a pulse value from the list of optional values using NEXT button and then ENT. to save your selection. Optional values are between 1 to 100,000.
⇨	ENT. to enter a pulse width value (as specified in your equipment).	PL1 000 For example, 1000ms.	Enter a pulse width value between 20 milliseconds and 2000 milliseconds (the resolution of 10 milliseconds).