Functional Description

Total01 - Totalizer

Version 5.2-0

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Section 1 - Introduction

General

Total01 is a functional unit for totalizer in Control^{IT}, to be operated from 800xA System. A Total01 normally performs a complete function independently.

Total01 has the following functions and properties:

- Different control modes, set by operator or by control logic
- Store current and previous value
- Reset function
- Event detection and handling

Section 2 - Function Block & Data Types

Function Block

Name	Data Type	Attributes	Direction	FD Port	Initial value	Description
Name	string	coldretain	in	yes	'Total01'	Object name
Description	string	coldretain	in	yes	'Descr'	Object description
Enable	bool	coldretain	in	yes	true	Enable object
MV	real	retain	in	yes		Measured Value
Scale	real	coldretain	in	yes	1.0	Bias
InputErr	dword	retain	in	yes	16#C0	MV status
TI	time	coldretain	in	yes	1h	Integration Time
Reset	bool	retain	in	yes		Reset (Q value is moved to Q_Prev)
SeqHold	bool	retain	in	yes		Order mode to Man
SeqE1	bool	retain	in	yes		Order mode to E1
InPar	Total01_InPar	by_ref	in	yes		In Parameter
EventName	string	coldretain	in	yes	'||Total01_'	Event name
Q	real	coldretain	out	yes		Total for this period
Q_Prev	real	coldretain	out	yes		Total for previous period
HoldInd	bool	retain	out	yes		Man mode
E1	bool	retain	out	yes		E1 mode
SignalErr	bool	retain	out	yes		Error
OutPar	Total01_OutPar	by_ref	out	yes		Out Parameter
Opr	Total01_Opr	by_ref	out	yes		Operator order

Data Types

Total01_InPar

Total01_InPar data type contains all configuration parameter available in Total01. Configuration can be entered by writing value to this structured data type and connecting it to input **InPar** of Total01 function block.

Name	Data Type	Attributes	Initial value	ISP value	Description
Class	dint	coldretain	500		AE class
Severity	dint	coldretain	1000		AE severity
Unit	string[10]	coldretain	''		Totaliser Unit
Dec	dint	coldretain	1		Totaliser Decimal
MVUnit	string[10]	coldretain	''		MV Unit
MVDec	dint	coldretain	1		MV Decimal
InitMode	dint	coldretain	7		Init mode (7 = E1 ; 11 = Hold/Man)
HoldBlk	bool	coldretain	false		Block operator order Hold mode
E1Blk	bool	coldretain	false		Block operator order E1 mode
ResetBlk	bool	coldretain	false		Block operator order Reset command
SeqHoldEvBlk	bool	coldretain	true		Block event for SeqHold
SeqE1EvBlk	bool	coldretain	true		Block event for SeqE1
ResetEvBlk	bool	coldretain	true		Block event for Reset
ErrCtrl	bool	coldretain	false		No error at overflow

Total01_OutPar

Total01_OutPar data type contains all information on the object which not available on the output parameter of the function block.

Name	Data Type	Attributes	Initial value	ISP value	Description
Mode	dint	retain			Active mode
NormalMode	bool	retain			Normal mode (Active mode = Init mode)
AlErr	bool	retain			MV error

Total01_Opr

Total01_Opr data type contains all operator order.

Name	Data Type	Attributes	Initial value	ISP value	Description
Hold	bool	retain			Operator order Hold mode
E1	bool	retain			Operator order E1 mode
Reset	bool	retain			Operator order Reset command

Permission

All variables in **Total01_InPar** data type are set with *Configure* permission in 800xA system. All variables in **Total01_Opr** data type are set with *Operate* permission.

The variable permission can be configured according to the plant requirement. This can be done by adding **Property Attribute Override** aspect for the object in Control Structure or for the object type in Object Type Structure.

Section 3 - Function

Control Modes

Two control modes are available: E1 and Hold. Active mode is indicated on the faceplate and object display. These modes can also be blocked individually from operator access.

E1 Mode

E1 mode is the default init mode of the Total01. In this mode, output **Q** is obtained by incrementing the input **MV**. E1 mode can be activated from the **E1** button on the faceplate or with a rising edge pulse to the input **SeqE1** of the function block.

Hold Mode

In this mode, the totalizing function is hold. The output **Q** value is not updated. Hold mode can be activated from the **Hold** button on the faceplate or with a rising edge pulse to the input **SeqHold** of the function block.

Range

Range parameter can be set from interaction window. It includes Decimal / Fraction and Unit for both the input and the totalizer value.

Function

The total value is calculated from the input **MV**. It will be incremented on each scan and also depends on the input parameter **Scale** and **TI**. The input **Scale** can be used to scale the output **Q** when there's a need to convert to different unit. The input **TI** is used to define the integration time and should follow the input unit.

For example, the input ***MV*** is in *kg/h*. The input **TI** shall be set to *1h*. If the output is defined as *kg*, then input **Scale** should be set to *1*. If the output is defined as *tons*, then input **Scale** should be set to *0.001*.

The output **Q** value will be transferred to **Q_Prev** when reset is occurred. Reset can be activated from the **Reset** button on the faceplate or with a rising edge pulse to the input **Reset** of the function block

Signal Status

Total01 monitors the **MV** status using input parameter **InputErr**. Error occurs if **MV** connected to IO module and the IO module function is deemed nonfunctional. Typical caused of errors are missing or faulty hardware and out of range values.

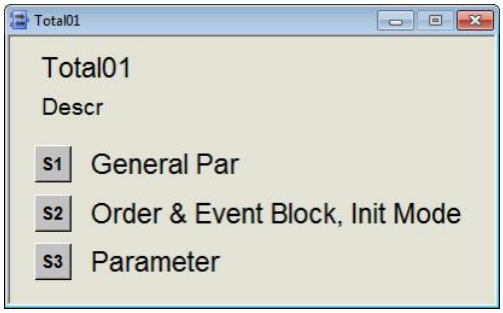
Errors generated from IO module are passed to Total01. The output parameter **SignalErr** is set to *True* when there is error. When error occurs, the totalizing function is held and output **Q** will not be updated.

Overflow or underflow will occur if the A/D converter is given value out of its range. In interaction window, it's possible to select no error when overflow.

Interaction Window

Interaction Window is used to configure the object's parameter in the Control Builder. It is only accessible when Control Builder is in *Online* mode by right clicking the function block.

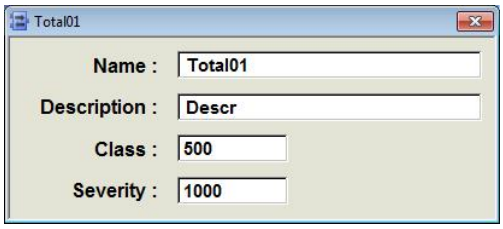
The main Interaction Window shows the name and description of the function block. The buttons are link to open the sub-window.



1. General Par

Name and **Description** can be entered from interaction window or from the function block parameters directly. After performing *Name Uploader*, these values will be used as Object Name and Description and shown in faceplate.

Class defines the process section or area in which alarms are grouped. By utilizing **Class**, the alarms can be filtered. Valid values are 1 - 9999. **Severity** defines the alarm priority for general alarms. Valid values are 1 - 1000 where 1000 is the highest priority.



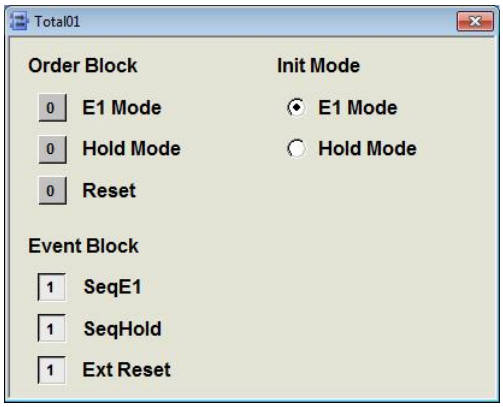
2. Order & Event Block, Init Mode

Order Block is used to prevent operator from giving an order of certain activity. The faceplate button will be dimmed if order block is activated (set to 1).

Event Block is used to block the event message generated due to changes in value from logic connection. To enable event for selected message, press the button to set the value to 0. The text

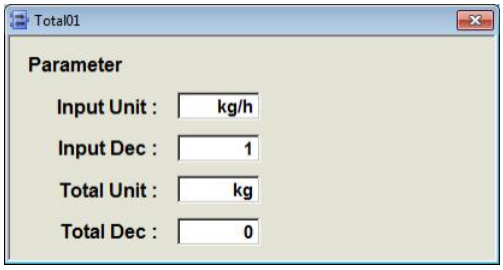
message for each event is stored in the **AE Translator** aspect. List of events for all operator activity is managed in 800xA system with Audit Trail functionality.

Init Mode defines the initial mode of the object when cold download is performed. By default, the init mode for Total01 is E1 mode.



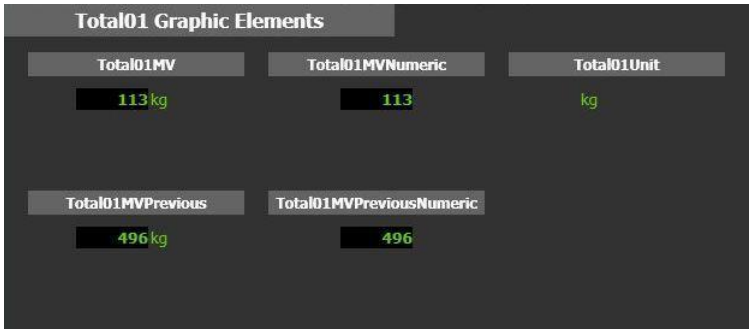
3. Parameter

It covers unit and decimal of input and the total.



Process Display

Total01 has the following graphic elements which can be inserted into graphic displays.



Faceplate

Aspect Link

Icon	Aspect View
	Operator Note

Faceplate

Faceplate gives basic information about the object. Size and contents have been optimized to cover most of the normal process operator action.



Alarm & Event

Alarm & Event List

All alarm & event list aspect is configured to follow the templates defined in **PP Library Alarm & Event List Configurations** in Library Structure.

Event Message

The **Message Description** is stored in the **AE Translator** aspect in Object Type Structure and support NLS functionality.

Resource Id	Message Description
Reset	Ext Reset
SeqE1	SeqE1
SeqHold	SeqHold