


FUNCTIONAL DESCRIPTION

DRICON_S

Variable Speed Motor, ACS550/600/800

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Contents

1. General 4

2. Configuration 4

3. Function Block DRICON_S..... 5

4. DRICON_S Datatypes 8

 4.1 DRICON_S_InPar 8

 4.2 DRICON_S_OutPar 9

 4.3 DRICON_S_Opr..... 10

5. Function Description 11

 5.1 Basic Properties 11

 5.2 Motor Control Modes 11

 5.2.1 JOG 12

 5.2.2 LOCAL 12

 5.2.3 MANUAL 13

 5.2.4 EXTERNAL 1 and EXTERNAL 2 13

 5.2.5 DISABLED 13

 5.2.6 PANEL Mode 13

 5.3 Setpoint Modes 14

 5.3.1 LOCAL Setpoint 14

 5.3.2 MANUAL Setpoint 14

 5.3.3 EXTERNAL Setpoint 14

 5.4 Setpoint Speed 15

 5.5 Setpoint Tracking 15

 5.6 Ready for Start 15

 5.7 Ready 15

 5.8 Start-up 15

 5.9 Interlocks 15

 5.10 Start and Stop 16

 5.10.1 Start and Stop Order at Different Motor Control Modes 17

 5.11 Fault Evaluation in the Drive 18

 5.12 Supervision of Load Control 18

 5.13 Interaction Window 18

 5.13.1 DRICON_S Interaction Window 18

 5.13.2 General Parameters 19

 5.13.3 Order Block 19

 5.13.4 Alarm & Event Block 20

 5.13.5 Interlock Settings 21

 5.13.6 Drive settings 22

 5.13.7 Texts 23

 5.13.8 Ranges & Settings 23

 5.13.9 Maintenance 24

6. Operator Functions 25

 6.1 Display elements 25

 6.1.1 Object Display 26

 6.1.2 Diagnostic Display 26

 6.1.3 Process Display 31

 6.1.4 Interlock Display 31

 6.2 Time-logged Properties 32

 6.3 Faceplate (Dialog) 33

6.4	Alarm and Event Handling.....	35
6.4.1	General.....	35
6.4.2	General Alarm Message	36
6.4.3	General Event Message	36
6.4.4	Event Message specific for AC550	38
6.4.5	Event Message specific for AC600	39
6.4.6	Event Message specific for AC800	41
6.5	Faceplate Tabs	43
6.5.1	Signals.....	43
6.5.2	Alarm Block	43
6.5.3	Digital Inputs.....	44
6.5.4	Info text.....	44
6.5.5	Maintenance	45
7.	Drive Configuration	46
7.1	Parameter Group Configuration.....	46
7.2	Data from the Drive	47
7.3	Drive Supervision	47
8.	Control Builder M Configuration.....	47
8.1	Connection for AC550	47
8.2	Connection for ACS600 and ACS800.....	48

1. General

DRICON_S is a functional unit designed for the control of variable speed motors in different processes. It is based on the functionality of Mot01 and is designed primarily for use with AC frequency converters delivered by ABB.

The functional unit is standardised to a high degree to simplify the work of designing presentation, dialog and control logic. The unit has many optional capabilities, which increase its operational flexibility. DRICON_S normally performs its control function without help from other elements.

DRICON_S is used in the control of variable speed motors from Operate^{IT} Operator Station, control desks or control organs at the motor itself. The motor can be controlled from a master control function (e.g. group start, level regulation from level gauges etc).

2. Configuration

DRICON_S like other functional units is built up of two parts:

- A Function Block, which is handled in the same way as other Function Blocks in the ABB Controller 800M range of products. Figure 3.1 illustrates the terminals on the function block.
- A section for operator functions, which consists of presentation and order functions. Data and parameters from the process are presented on an Operate^{IT} Operator Station. The keyboard of the Operate^{IT} Operator Station is used by the operator to enter commands which control the operation of the functional unit. The response to the operator's intervention is shown on the display screen of the Operate^{IT} Operator Station. The application work for this part is normally limited to the arrangement of the display. Figure 2.1 shows the structure of the functional unit.

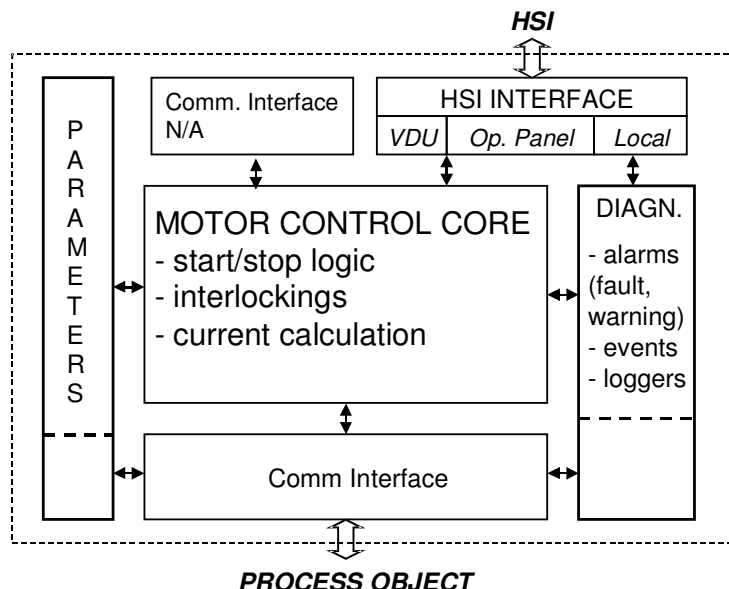


Figure 2-1. The Structure of the Functional Unit

3. Function Block DRICON_S

FUNCTION OF INPUT TERMINALS	DRICON_S		FUNCTION OF OUTPUT TERMINALS
Object name	Name		
Object description	Description		
Enable object	Enable		
	----- DrivePar -----		
1=ACS550, 2=ACS600, 3=ACS800	DriveType	NoInt	No Interlocks
1=ASXR7xxx, 2=ASXR7260	DriveSoftware	NoClnt	No Safety Interlocks (IC)
Profibus status	UnitStatus	NoIBInt	No Process Interlocks (IB)
Enable control circuit alarm	ME	NoAlnt	No Sequence Interlocks (IA)
Control voltage	M1	Trip	Trip
Safety Interlock 1	IC1	Blk	Standby
Safety Interlock 2	IC2	RFS	Ready for start
Safety Interlocks	ICs	Ready	Motor Ready Indication in E1 or E2
Process Interlock 1	IB1	SO1	Start order
Process Interlock 2	IB2	SACk	Start order acknowledgement
Process Interlock 3	IB3	StartWarn	Start warning
Process Interlock 4	IB4	Ack1	Main contactor acknowledge
Process Interlocks	IBs	Run	Running
Sequence Interlock 1	IA1	PanelMode	Panel mode
Sequence Interlock 2	IA2	JogInd	Jog mode
Sequence Interlocks	IAs	LocalInd	Local mode
Start order pulse Time	T1	ManInd	Man mode
Supervision Time	T2	E1Ind	E1 mode
Run interlock delay Time	T3	E2Ind	E2 mode
Start warning time	TWarn	SP_Local	Local SP mode
Start order in E1 mode	E1Start	SP_Man	Man SP mode
Start order in E2 mode	E2Start	SP_Ext	External SP mode
Stop order in external mode	Stop	SP_OUT	Speed setpoint (in unit)
Order mode to Jog	JogEnbl	NormCurr	Normal current (%)
Start order in Jog mode	JogStart	Curr	Actual current (%)
Jog start hold function	JogFunc	Current	Actual current (in unit)
Order mode to Local	LEnbl	Torque	Actual torque (in unit)
Start order in Local mode	L1	Temp	Actual temperature (in unit)
Local Stop order	LStop	ActSpeed	Actual speed (in unit)
Order mode to Man	SeqMan	NoOfStart	Number of start
Order mode to E1	SeqE1	RunTime	Running time (in minutes)
Order mode to E2	SeqE2	OutPar	Out Parameter
Run Interlock 1	RunInt1	Opr	Operator order
Run Interlock 2	RunInt2		
Function for Run Interlock 2	RunInt2F		
Track A Enable - Bumpless from E1 to Auto	Track_A		
Track B Enable - Bumpless from Local to Auto	Track_B		
Order SP mode to Man	SeqManSP		
Order SP mode to External	SeqExtSP		
Max setpoint change rate in External SP mode (unit/s)	Speed1		
External reference setpoint in External SP mode	ExtRef		
Block alarm	AlcBlk		
Acknowledge alarm	AlarmAck		
In Parameter	InPar		
Event name	EventName		

Figure 3-1. Function Block, Complete symbol

Table 3-1 below illustrates the default properties of each terminal of DRICON_S function block.

Name	Data Type	Attributes	Direction	FD Port	Initial value	Description
Name	string	coldretain	in	yes	'Dricon_S'	Object name
Description	string	coldretain	in	yes	'Descr'	Object description
Enable	bool	coldretain	in	yes	true	Enable object
DrivePar	ACS600Std_Par		in_out	yes		Communication with Drive
DriveType	dint	coldretain	in	yes	3	1=ACS550, 2=ACS600, 3=ACS800
DriveSoftware	dint	coldretain	in	yes	1	1=ASXR7xxx, 2=ASXR7260
UnitStatus	dint	retain	in	yes		Profibus status
ME	bool	retain	in	yes	true	Enable control circuit alarm
M1	bool	retain	in	yes	true	Control voltage
IC1	bool	retain	in	yes	true	Safety Interlock 1
IC2	bool	retain	in	yes	true	Safety Interlock 2
ICs	ICConn	by_ref	in	yes		Safety Interlocks
IB1	bool	retain	in	yes	true	Process Interlock 1
IB2	bool	retain	in	yes	true	Process Interlock 2
IB3	bool	retain	in	yes	true	Process Interlock 3
IB4	bool	retain	in	yes	true	Process Interlock 4
IBs	IBConn	by_ref	in	yes		Process Interlocks
IA1	bool	retain	in	yes	true	Sequence Interlock 1
IA2	bool	retain	in	yes	true	Sequence Interlock 2
IAs	IAConn	by_ref	in	yes		Sequence Interlocks
T1	time	coldretain	in	yes	2s	Start order pulse Time
T2	time	coldretain	in	yes	4s	Supervision Time
T3	time	coldretain	in	yes	5s	Run interlock delay Time
TWarn	time	coldretain	in	yes	0s	Start warning time
E1Start	bool	retain	in	yes		Start order in E1 mode
E2Start	bool	retain	in	yes		Start order in E2 mode
Stop	bool	retain	in	yes	true	Stop order in external mode
JogEnbl	bool	retain	in	yes		Order mode to Jog
JogStart	bool	retain	in	yes		Start order in Jog mode
JogFunc	bool	retain	in	yes		Jog start hold function
LEnbl	bool	retain	in	yes		Order mode to Local
L1	bool	retain	in	yes		Start order in Local mode
LStop	bool	retain	in	yes	true	Local Stop order
SeqMan	bool	retain	in	yes		Order mode to Man
SeqE1	bool	retain	in	yes		Order mode to E1
SeqE2	bool	retain	in	yes		Order mode to E2
RunInt1	bool	retain	in	yes	true	Run Interlock 1
RunInt2	bool	retain	in	yes	true	Run Interlock 2
RunInt2F	bool	retain	in	yes		Function for Run Interlock 2
Track_A	bool	coldretain	in	yes	true	Track A Enable - Bumpless from E1 to Auto
Track_B	bool	coldretain	in	yes	true	Track B Enable - Bumpless from Local to Auto
SeqManSP	bool	retain	in	yes		Order SP mode to Man
SeqExtSP	bool	retain	in	yes		Order SP mode to External
Speed1	real	coldretain	in	yes	500	Max setpoint change rate in External SP mode (unit/s)
ExtRef	real	retain	in	yes		External reference setpoint in External SP mode
AlcBlk	bool	retain	in	yes		Block alarm
AlarmAck	bool	retain	in	yes		Acknowledge alarm
InPar	DriconS_InPar	by_ref	in	yes		In Parameter
EventName	string	coldretain	in	yes	' Dricon_'	Event name
NoInt	bool	retain	out	yes		No Interlocks
NoICInt	bool	retain	out	yes		No Safety Interlocks (IC)
NoIBInt	bool	retain	out	yes		No Process Interlocks (IB)
NoIAlnt	bool	retain	out	yes		No Sequence Interlocks (IA)

Name	Data Type	Attributes	Direction	FD Port	Initial value	Description
Trip	bool	retain	out	yes		Trip
Blk	bool	retain	out	yes		Standby
RFS	bool	retain	out	yes		Ready for start
Ready	bool	retain	out	yes		Motor Ready Indication in E1 or E2
SO1	bool	retain	out	yes		Start order
SAck	bool	retain	out	yes		Start order acknowledgement
StartWarn	bool	retain	out	yes		Start warning
Ack1	bool	retain	out	yes		Main contactor acknowledge
Run	bool	retain	out	yes		Running
PanelMode	bool	retain	out	yes		Panel mode
JogInd	bool	retain	out	yes		Jog mode
LocalInd	bool	retain	out	yes		Local mode
ManInd	bool	retain	out	yes		Man mode
E1Ind	bool	retain	out	yes		E1 mode
E2Ind	bool	retain	out	yes		E2 mode
SP_Local	bool	retain	out	yes		Local SP mode
SP_Man	bool	retain	out	yes		Man SP mode
SP_Ext	bool	retain	out	yes		External SP mode
SP_OUT	real	retain	out	yes		Speed setpoint (in unit)
NormCurr	real	retain	out	yes		Normal current (%)
Curr	real	retain	out	yes		Actual current (%)
Current	real	retain	out	yes		Actual current (in unit)
Torque	real	retain	out	yes		Actual torque (in unit)
Temp	real	retain	out	yes		Actual temperature (in unit)
ActSpeed	real	retain	out	yes		Actual speed (in unit)
NoOfStart	dint	coldretain	out	yes		Number of start
RunTime	real	coldretain	out	yes		Running time (in minutes)
OutPar	DriconS_Out Par	by_ref	out	yes		Out Parameter
Opr	DriconS_Opr	by_ref	out	yes		Operator order

Table 3-1 Terminal Properties

4. DRICON_S Datatypes

4.1 DRICON_S_InPar

Name	Data Type	Attributes	Initial value	ISP value	Description
Class	dint	coldretain	500		AE class
Severity	dint	coldretain	1000		AE severity
SpeedRange	RangeReal	coldretain			Speed Range
SpeedSPLimit	RangeLimit	coldretain			Speed SP limit
InitMode	dint	coldretain	5		Init mode (5 = Man ; 7 = E1 ; 8 = E2)
InitSPMode	dint	coldretain	2		Init SP mode (2= Man SP ; 3= ExtSP)
JogBlk	bool	coldretain	false		Block operator order Jog mode
LocalBlk	bool	coldretain	false		Block operator order Local mode
ManBlk	bool	coldretain	false		Block operator order Man mode
E1Blk	bool	coldretain	false		Block operator order E1 mode
E2Blk	bool	coldretain	false		Block operator order E2 mode
LocalSPBlk	bool	coldretain	false		Block operator order Local SP mode
ManSPBlk	bool	coldretain	false		Block operator order Man SP mode
ExtSPBlk	bool	coldretain	false		Block operator order Ext SP mode
StartBlk	bool	coldretain	false		Block operator order Start command
StopBlk	bool	coldretain	false		Block operator order Stop command
AlcBlkEvBlk	bool	coldretain	true		Block event for AlcBlk
LEnblEvBlk	bool	coldretain	true		Block event for LEnbl
JogEnblEvBlk	bool	coldretain	true		Block event for JogEnbl
SeqManEvBlk	bool	coldretain	true		Block event for SeqMan
SeqE1EvBlk	bool	coldretain	true		Block event for SeqE1
SeqE2EvBlk	bool	coldretain	true		Block event for SeqE2
SeqManSPEvBlk	bool	coldretain	true		Block event for SeqManSP
SeqExtSPEvBlk	bool	coldretain	true		Block event for SeqExtSP
PanelEvBlk	bool	coldretain	true		Block event for Panel
ExtStartEvBlk	bool	coldretain	true		Block event for ExtStart
ExtStopEvBlk	bool	coldretain	true		Block event for ExtStop
IABlockNotExtMode	bool	coldretain	true		IA Blocked when Not In E1 or E2 Mode
IA1	IAInParType1	coldretain			Configuration for IA1
IA2	IAInParType1	coldretain			Configuration for IA2
IAs1	IAInParType1	coldretain			Configuration for IAs.IA1
IAs2	IAInParType1	coldretain			Configuration for IAs.IA2
IB1	IBInParType1	coldretain			Configuration for IB1
IB2	IBInParType1	coldretain			Configuration for IB2
IB3	IBInParType1	coldretain			Configuration for IB3
IB4	IBInParType1	coldretain			Configuration for IB4
IBs1	IBInParType1	coldretain			Configuration for IBs.IB1
IBs2	IBInParType1	coldretain			Configuration for IBs.IB2
IBs3	IBInParType1	coldretain			Configuration for IBs.IB3
IBs4	IBInParType1	coldretain			Configuration for IBs.IB4
IBs5	IBInParType1	coldretain			Configuration for IBs.IB5
IBs6	IBInParType1	coldretain			Configuration for IBs.IB6
IBs7	IBInParType1	coldretain			Configuration for IBs.IB7
IBs8	IBInParType1	coldretain			Configuration for IBs.IB8
IC1	ICInParType1	coldretain			Configuration for IC1
IC2	ICInParType1	coldretain			Configuration for IC2
ICs1	ICInParType1	coldretain			Configuration for ICs.IC1
ICs2	ICInParType1	coldretain			Configuration for ICs.IC2
TempScale	real	coldretain	10		Temperature scale
TempUnit	string	coldretain	'C'		Temperature unit
TorqScale	real	coldretain	10000		Torque scale
TorqUnit	string	coldretain	'%'		Torque unit
CurrScale	real	coldretain	10		Current scale
RatedCurr	real	coldretain	100.0		Rated current
NormalCurr	real	coldretain	50.0		Normal current

Name	Data Type	Attributes	Initial value	ISP value	Description
CurrUnit	string	coldretain	'A'		Current unit
ShowCurrent	bool	coldretain	false		Show current presentation
ResetSP	bool	coldretain	false		Reset SP when stopping motor in Man Mode
AEConfigCommErr	dint	coldretain	1		AE configuration for Communication Error
AEConfigExtRun	dint	coldretain	1		AE configuration for External Run Disabled
AEConfigFault	dint	coldretain	1		AE configuration for Fault
AEConfigM1	dint	coldretain	1		AE configuration for M1
AEConfigMCErr	dint	coldretain	1		AE configuration for Main Contactor Error
AEConfigReadyOn	dint	coldretain	1		AE configuration for Motor Not Ready On
AEConfigOnInhibit	dint	coldretain	1		AE configuration for OnInhibit
AEConfigRInt1	dint	coldretain	0		AE configuration for Run Interlock 1
AEConfigRInt2	dint	coldretain	0		AE configuration for Run Interlock 2
AEConfigSuprvLimit	dint	coldretain	1		AE configuration for Actual Value > Supervision Limit
AEConfigWarning	dint	coldretain	1		AE configuration for Warning
EnNoOfStartCounter	bool	coldretain	false		Enable number of start counter
EnRunTimeCounter	bool	coldretain	false		Enable running time counter

4.2 DRICON_S_OutPar

Name	Data Type	Attributes	Initial value	ISP value	Description
AlarmBlk	bool	retain			Alarm blocked
IntlkBlk	bool	retain			Interlock blocked
IntlkBlkActive	bool	retain			Interlock blocked active
EnOverrideAll	bool	retain			Override All button enabled
Mode	dint	retain			Active mode
SPMode	dint	retain			Active SP mode
NormalMode	bool	retain			Normal mode (Active mode = Init mode)
NormalSPMode	bool	retain			Normal SP mode (Active SP mode = Init SP mode)
IA1Ind	bool	retain			IA1 interlocked
IA2Ind	bool	retain			IA2 interlocked
IB1Ind	bool	retain			IB1 interlocked
IB2Ind	bool	retain			IB2 interlocked
IB3Ind	bool	retain			IB3 interlocked
IB4Ind	bool	retain			IB4 interlocked
IC1Ind	bool	retain			IC1 interlocked
IC2Ind	bool	retain			IC2 interlocked
IAs1Ind	bool	retain			IAs1 interlocked
IAs2Ind	bool	retain			IAs2 interlocked
IBs1Ind	bool	retain			IBs1 interlocked
IBs2Ind	bool	retain			IBs2 interlocked
IBs3Ind	bool	retain			IBs3 interlocked
IBs4Ind	bool	retain			IBs4 interlocked
IBs5Ind	bool	retain			IBs5 interlocked
IBs6Ind	bool	retain			IBs6 interlocked
IBs7Ind	bool	retain			IBs7 interlocked
IBs8Ind	bool	retain			IBs8 interlocked
ICs1Ind	bool	retain			ICs1 interlocked
ICs2Ind	bool	retain			ICs2 interlocked
CommErr	AlarmInd	retain			Alarm Indication for CommErr
ExtRun	AlarmInd	retain			Alarm Indication for ExtRun
Fault	AlarmInd	retain			Alarm Indication for Fault
M1	AlarmInd	retain			Alarm Indication for M1
MCErr	AlarmInd	retain			Alarm Indication for MCErr
ReadyOn	AlarmInd	retain			Alarm Indication for ReadyOn
OnInhibit	AlarmInd	retain			Alarm Indication for OnInhibit
RInt1	AlarmInd	retain			Alarm Indication for RInt1

Name	Data Type	Attributes	Initial value	ISP value	Description
RInt2	AlarmInd	retain			Alarm Indication for RInt2
SuprvLimit	AlarmInd	retain			Alarm Indication for SuprvLimit
Warning	AlarmInd	retain			Alarm Indication for Warning
LastStop	dint	retain			Reason for last stop
StartTime	time	retain			Actual starting time
StopTime	time	retain			Actual stopping time

4.3 DRICON_S_Opr

Name	Data Type	Attributes	Initial value	ISP value	Description
BlockAlarm	bool	retain			Operator block alarms
Jog	bool	retain			Operator order Jog mode
Local	bool	retain			Operator order Local mode
Man	bool	retain			Operator order Manual mode
E1	bool	retain			Operator order E1 mode
E2	bool	retain			Operator order E2 mode
Start	bool	retain			Operator order Start command
Stop	bool	retain			Operator order Stop command
Reset	bool	retain			Operator order Reset command
LocalSP	bool	retain			Operator order Local SP mode
ManSP	bool	retain			Operator order Man SP mode
ExtSP	bool	retain			Operator order Ext SP mode
OverrideAll	bool	retain			Operator override all interlocks
IB1Override	bool	retain			Operator override IB1 interlock
IB2Override	bool	retain			Operator override IB2 interlock
IB3Override	bool	retain			Operator override IB3 interlock
IB4Override	bool	retain			Operator override IB4 interlock
IBs1Override	bool	retain			Operator override IBs.IB1 interlock
IBs2Override	bool	retain			Operator override IBs.IB2 interlock
IBs3Override	bool	retain			Operator override IBs.IB3 interlock
IBs4Override	bool	retain			Operator override IBs.IB4 interlock
IBs5Override	bool	retain			Operator override IBs.IB5 interlock
IBs6Override	bool	retain			Operator override IBs.IB6 interlock
IBs7Override	bool	retain			Operator override IBs.IB7 interlock
IBs8Override	bool	retain			Operator override IBs.IB8 interlock
IA1Override	bool	retain			Operator override IA1 interlock
IA2Override	bool	retain			Operator override IA2 interlock
IAs1Override	bool	retain			Operator override IAs.IA1 interlock
IAs2Override	bool	retain			Operator override IAs.IA2 interlock
SP	real	coldretain	0.0		Operator enter manual SP
ResetCounter	bool	retain			Order reset counter

5. Function Description

5.1 Basic Properties

The DRICON_S functional unit is designed for the control of variable speed motors, i.e. AC-Drives.

DRICON_S units consist of the following basic functions.

- Supervision of control circuits
- Evaluation of interlocks
- Control of on/off
- Supervision of motor current/torque
- Running of tests from the motor site
- Control from the local operator's panel
- Manual/External running
- Supervision of operations via Operate^{IT} Operator Station
- Speed Setpoint Control

5.2 Motor Control Modes

DRICON_S is intended for control from Operate^{IT} Operator Station i.e. from a central control room. However, it is also possible to select other modes of control and thus control DRICON_S from other locations.

All the control modes can be selected from the central operator station. The LOCAL control mode may also be selected from the local control station.

The different modes of control are as follows:

- Jog
- Local
- Manual
- External 1
- External 2

By selecting control mode, the operator decides from which location the motor is to be controlled. All control modes may be selected through dialog in Operate^{IT} Operator Station. The LOCAL control mode may also be selected from the local control station through the Function Block input :LE, provided that the current control mode is neither JOG, nor DISABLE.

For the different control modes, DRICON_S is controlled as follows. For a summary of the control modes, see Table 3-1.

5.2.1 JOG

The control mode JOG is suitable for testing the motor in the field. The motor is supposed to be controlled from a stop/start station adjacent to the motor. Control from other locations is blocked. When the motor is leaving Jog mode a stop order is generated automatically.

The supervision of interlocks is limited. Only the safety interlocks SafetyInt1 and SafetyInt 2 as well as faults in the control voltage chain (the input :M1) prevent starting.

The motor is started and stopped through the inputs :JogStart and :JogFunc.

:JogStart, Start order from field-mounted start/stop station

:JogFunc, Stop/Hold function from field-mounted start/stop station

The function of these inputs is set out in tabular form below.

:JogStart	:JogFunc	
0	0	Stop order.
0	1	No change.
1	0	Start and stop order in :JogStart input.
1	1	Start order on :JogStart and stop order on :JogFunc.

When :JogFunc=1, the motor is stopped by breaking the control voltage chain, i.e. signified by any of the :M1 input going low.

5.2.2 LOCAL

The motor is controlled from a local desk or panel. Control from other locations is blocked.

LOCAL control mode, like other points of control, may be selected from Operate^{IT} Operator Station. In addition, LOCAL control mode may be selected from the local control panel through the input :LEnbl as follows:

:LEnbl = 1: The control mode is LOCAL, as long as the Operate^{IT} Operator Station operator does not request JOG or STAND BY. All other control modes are blocked and :LEnbl must be released before a mode change can occur.

LEnbl -> 0: DRICON_S resumes the either the previous or the latest control mode called for from Operate^{IT} Operator Station.

The operator controls the motor through the inputs :Lstart and :LStop.

:LStop Local stop order (active low)

:Lstart Local start order

The function of these inputs is set out in tabular form below.

:Lstop	:Lstart	
0	X	Stop order. Note In order for the motor to start when LStop has been low, LStart must be set high and LStart must make a low-to-high transition
1	0	No change
1	1	Start order

5.2.3 MANUAL

The motor is controlled from Operate^{IT} Operator Station. Control from other locations is blocked. This is the default control mode. To start, the operator has to press the key START. To stop the motor, the key STOP has to be pressed.

5.2.4 EXTERNAL 1 and EXTERNAL 2

The motor is controlled from external signals, e.g. from a process signal. Control from other locations is blocked. This mode is e.g. used for on/off control of levels and for automatic start up and shutdown of belt conveyors etc.

EXTERNAL 2 functions in exactly the same way as EXTERNAL 1. EXTERNAL 2 is used when the motor is to be controlled by Level 2 application software e.g. Auto Series Software.

The function is enabled by inputs :SeqE1 and :SeqE2.

The process controls the motor through the inputs :E1Start, :E2Start and :Stop. The operator is able to stop the motor by issuing stop order from Operate^{IT} Operator Station. The control mode then changes to Manual, to prevent the motor from being restarted.

:Stop Stop order (active low)

:StartE1(2) Start order

The function of these inputs is set out in tabular form below:

:Stop	:StartE1(2)	
0	X	Stop order
1	0 -> 1	Start order

:StartE1(2) are dynamic inputs, i.e. they trigger on the rising edge.

5.2.5 DISABLED

The motor is stopped and all orders to it are blocked. Used to take the motor Out of Service.

5.2.6 PANEL Mode

Panel Mode is activated from the panel unit for the Drive. The motor control will be taken over to the panel unit at the Drive. All Dialog button will be dimmed and operator can't do any actions. During Panel mode all commands from the FB Dricon_S are ignored.

If the motor is running at the time Panel mode is activated the motor will continue to run. When the Panel mode is deactivated the mode will be Manual mode.

5.3 Setpoint Modes

As for the Motor Control Modes above the speed setpoint can also be entered from a local control station (the frequency converters control panel), or from the Operate^{IT} Operator Station or from a program in the AC800M.

The different setpoint modes are as follows:

- Local
- Manual
- External

By selecting setpoint mode, the operator decides from which location the setpoint is to be controlled. All setpoint modes may be selected through dialog in Operate^{IT} Operator Station.

There is no correlation between motor control modes and setpoint modes i.e. when the motor is controlled using LOCAL this does not mean that the Setpoint changes mode to LOCAL too. If this functionality is required then the logic will need to be programmed externally to the function block. All motor control modes are not affected by changes in the Setpoint modes.

For the different setpoint modes, DRICON_S is controlled as follows:

5.3.1 LOCAL Setpoint

The LOCAL setpoint mode may be selected from the drive itself by setting the drive to local. All other setpoint modes are blocked and the drive must be set to remote before a mode change can occur.

The setpoint mode LOCAL is suitable entering a Setpoint from the frequency converter or from a local panel next to the motor. Setpoints from other modes are blocked. The output terminal :SP_Local in the function block is set true indicating the mode is active.

5.3.2 MANUAL Setpoint

The MANUAL setpoint mode is selected by using the Function Block input: SeqManSP or through the dialog in Operate^{IT} Operator Station, provided that function block is not disabled.

When in MANUAL setpoint mode it is possible to change the speed of the motor by entering the desired setpoint. Setpoints from other modes are blocked but it is still possible to change to these modes from the dialog in Operate^{IT} Operator Station.

The output terminal: SP_Man in the function block is set true indicating the mode is active.

5.3.3 EXTERNAL Setpoint

The EXTERNAL setpoint mode is selected by using the Function Block input: SeqExtSP or through the dialog in Operate^{IT} Operator Station, provided that function block is not disabled.

The EXTERNAL mode enables a setpoint to be provided from an external signal e.g. from a PID controllers output. Setpoints from other modes are blocked but it is still possible to change to these modes from the dialog in Operate^{IT} Operator Station

The output terminal: SP_Ext in the function block is set true indicating the mode is active.

5.4 Setpoint Speed

Terminal :Speed1 is a coefficient used to restrict the ramp speed of the setpoint. The value entered is the slope of the curve required. This value will depend on the range of the setpoint. All setpoint changes are restricted by the ramp speed in all modes excepting Local setpoint mode. When changing to local mode from manual mode and external mode the local modes setpoint is indicated directly. In Local mode the setpoint is only displayed in DRICON_S, and setpoint speed has no affect.

Setpoint Speed Coefficient = Setpoint Range / Ramp Time Required

5.5 Setpoint Tracking

The setpoint tracking function is enabled by terminals :Track_A and :Track_B.

Track_A is used to retain the external setpoint when changing mode from External to Manual.

Track_B is used to retain the local setpoint when changing mode from Local to Manual.

5.6 Ready for Start

Ready for start means that all the interlocks are satisfied, that there are no alarms and that the control mode is not JOG or that the control is DISABLED and the drive is in remote mode.

Ready for start is indicated by the DRICON_S displays in the Operate^{IT} Operator Station and by the output terminal :RFS (Ready For Start) in the function block.

5.7 Ready

The output terminal: READY has the same functionality as the terminal: RFS but the motor has to be in External 1 or External 2 mode for the output to be set. This terminal is used in sequence applications to check the status of the motor i.e. when the motor is part of a sequence or group start.

5.8 Start-up

An initialisation phase begins at start of the AC800M system.

The result of this becomes:

The outputs are reset (to zero) except for the ManInd terminal, which is set (to 1).

Manual is the default control mode at system initialisation for both the motor and the setpoint. With additional function block logic it is possible to force the control mode to other modes at system initialisation.

5.9 Interlocks

The motor control can be interlocked by signals from the process and also by signals from the control logic. The interlocks are divided into four groups with the following designations and functions.

Safety Interlocks, which interlock the object for safety purposes. The two safety interlocks, :IC1 and :IC2, cannot be blocked.

Process Interlocks. There are 4 normal process interlocks, :IB1 to :IB4. All four interlocks can be configured to accept blocking by the operator. All four interlocks can also be configured as start interlocks. A start interlock will prevent the motor from starting, but will not stop a running motor.

External (Sequence) Interlocks. Interlocks on terminals :IA1 and :IA2 are used if the object is to be interlocked against other objects such as a pump motor or a group start or other conditions in an automatic sequence. . These interlocks are configurable as blocked or not when not in E1 resp. E2 mode.

If *IA blocked when not Ext* is equal to 1

Motor interlocked if IA1 is 0 and the motor is in E1 mode

Motor interlocked if IA2 is 0 and the motor is in E2 mode

If *IA blocked when not Ext* is equal to 0

Motor interlocked if IA1 or IA2 is 0 and the motor is in Man, E1, E2 or Local mode

The interlocks are not included in the conditions for indication of Ready for start.

Run Interlocks. The inputs :RunInt1 and :RunInt2 are intended for connection to operation monitors to obtain tripping or alarm in the event of faults. The inputs are to be TRUE when the equipment is faultless. In order to allow the motor to reach operational speed, RunInt1 and RunInt2 are blocked during the time :T3 after start-up. When the JOG control mode is selected, RunInt1 and RunInt2 are blocked. When RunInt1 or RunInt2 goes to 0, DRICON_S remembers this error status until the alarm is acknowledged. Input :RunInt1 has a motor tripping function whereas the input :RunInt2 function can be controlled with the parameter :RunInt2F. When input :RunInt2F = TRUE, the motor is tripped. With .RunInt2F = FALSE, only an alarm is given. Alarm handling of :RunInt1 and :RunInt2 is blocked internally in the Function Block with the motor at standstill.

An interlocking is active when the input is 0 (FALSE). All Process and External interlocks are blocked when the JOG control mode is selected.

5.10 Start and Stop

Start and stop commands for DRICON_S may originate from dialog with Operate^{IT} Operator Station or from Function Block inputs, depending on the control mode selected (See Section 5.2 Motor Control Modes, and Table 3.1).

When a start command is issued to DRICON_S, it is forwarded to the motor through the Bus connection DrivePar. The start order is a pulse with a duration which is determined by the input :T1.

The start order must be acknowledge within the time determined by the input :T2. The time T2 ought to be set longer than T1.

If the drive acknowledges the start order pulse within the time T2, DRICON_S keeps it high. The time T3 after the drive having responded, DRICON_S starts supervising the motor current. The time T3 is determined by the input :T3

If the drive does not acknowledge the start order within the time T2, the start attempt is deemed abortive. Consequently, DRICON_S issues an alarm about the start failure and a new attempt at starting may be made.

The start failure alarm indication on the object display of DRICON_S disappears when the operator acknowledges the alarm.

DRICON_S also issues an alarm about start failure when the drive acknowledges start orders falsely, i.e. when it sets the input high without any start order being issued. DRICON_S transmits the alarm the time T2 after the input having been set.

5.10.1 Start and Stop Order at Different Motor Control Modes

The table below describes the commands which can be given at the different control modes of DRICON_S.

Table 3-1. Relation between commands and control modes

Order	Jog	Local	Manual	Ext1	Ext2
Input JogStart	Start Stop	-	-	-	-
Input Lstart	-	Start	-	-	-
Input Lstop	-	Stop	-	-	-
Operator start	-	-	Start	-	-
Operator stop	-	-	Stop	Stop	Stop
Input StartE1	-	-	-	Start	-
Input StartE2	-	-	-	-	Start
Stop	-	-	-	Stop	Stop

5.10.1.1 Control mode JOG
FB input :JogStart

5.10.1.2 Control mode LOCAL
FB input :LStart

5.10.1.3 Control mode MAN
The operator issues a Start order from Operate^{IT} Operator Station.

5.10.1.4 Control mode Ext1 or Ext2

An superior control program sets the input :StartE1 or :StartE2 to issue a new start order. See the table below.

:StartE1(2)	Stop	Descr
0	0	No change.
1	0	No change.
1	1	Start order

5.10.1.5 Control mode DISABLE

The motor cannot be started.

5.11 Fault Evaluation in the Drive

Evaluation is performed in the drive and transmitted thru the bus connection DrivePar to the Function Block. The signal ME interlocks the complete evaluation. ME=0 is used to prevent incorrect alarms with, for example, a total control voltage failure. The input M1 are to be TRUE when there are no errors. The evaluation presupposes that the control circuit consists of a number of breaking contacts in series. Alarm handling of M1 is blocked internally in the Function Block with the motor at standstill.

5.12 Supervision of Load Control

Motor current , the torque or temperature indication is showed in the system. In the Interaction Window the correct measurement range and engineering units can be entered. These will then be presented accordingly in the Faceplate and Object display in the Operate^{IT} Operator Station.

5.13 Interaction Window

The interaction window is available in the Control^{IT} Control Builder. The interaction window is an engineering aid used to simplify configuration and blocking of signals not available on the faceplates. Changes to values in the Interaction window are only available in 'Online' mode in Control^{IT}.

5.13.1 DRICON_S Interaction Window

Interaction window overview. Name and description are shown. The buttons are links to sub-windows.

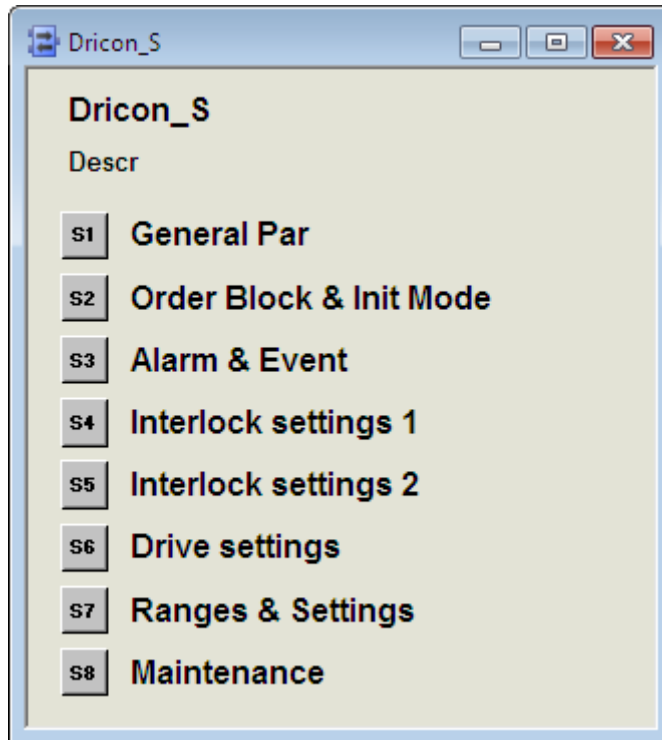


Figure 4-1 Main Interaction Window.

5.13.2 General Parameters

“Class” defines the process section or area in which alarms are grouped. By utilizing class the alarms can be filtered. Valid values are user defined. A suggestion would be to use mill area numbers as class values.

“Severity” defines the alarm priority for general alarms. The severity for alarms is entered in window “Alarm & Event”. Valid values are 1 –1000 where 1000 is the highest priority.

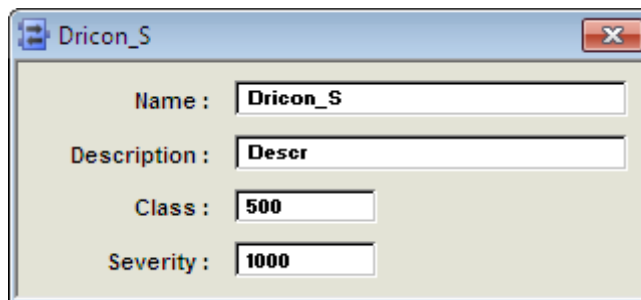


Figure 4-2 General Parameters.

5.13.3 Order Block

Blocking of operator orders is entered in this window.

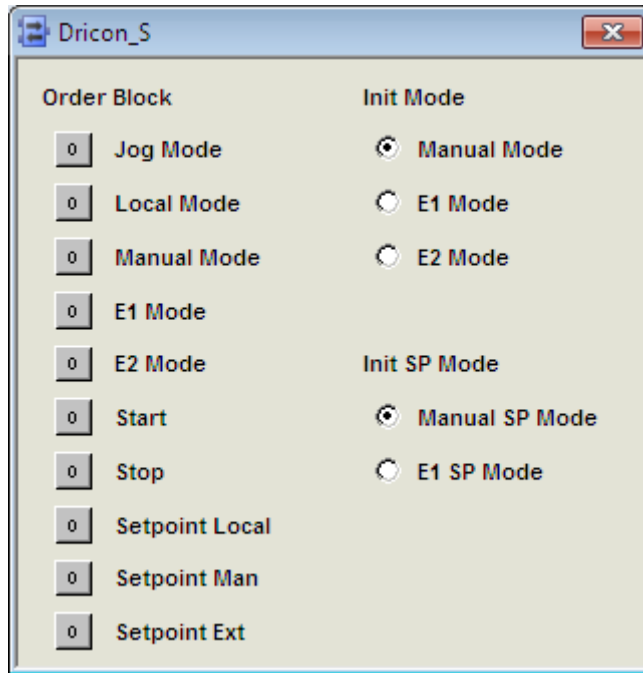


Figure 4-3 Order Block.

5.13.4 Alarm & Event Block

Alarm and Events are generated for status change on the signals defined in interaction window.

The layout of the alarm and event is described in chapter 6.4 Alarm and Event Handling.

All Operator Events are reported by Audit Trail Functionality and not included in the FunctionBlock.

The individual text string for each event is stored in the Alarm and Event Translator aspect. This text can be NLS handled.

Alarm and Event blockings are entered in this window.

For Alarm Configuration the following values are valid

- 0 No Alarm or Event are generated
- 1 Alarm and Event are generated
- 2 Event is generated

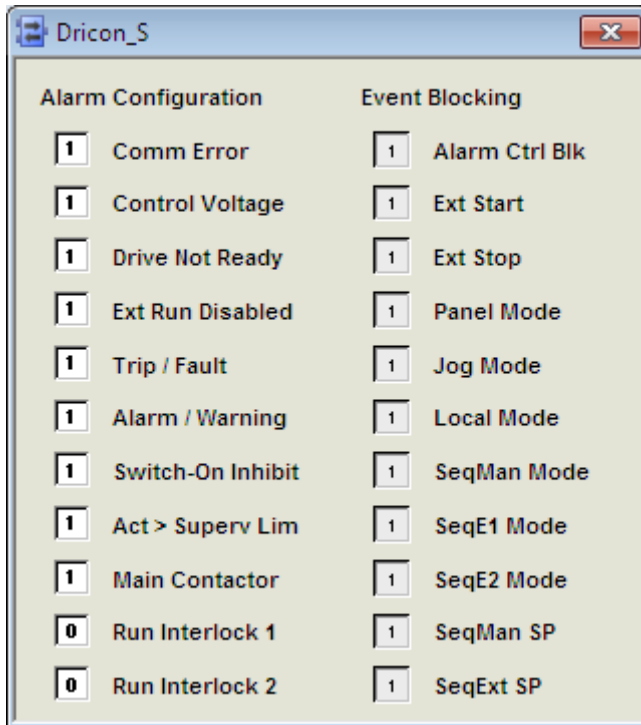


Figure 4-4 Indication Event Block.

5.13.5 Interlock Settings

The different settings for interlocks are entered in this window.

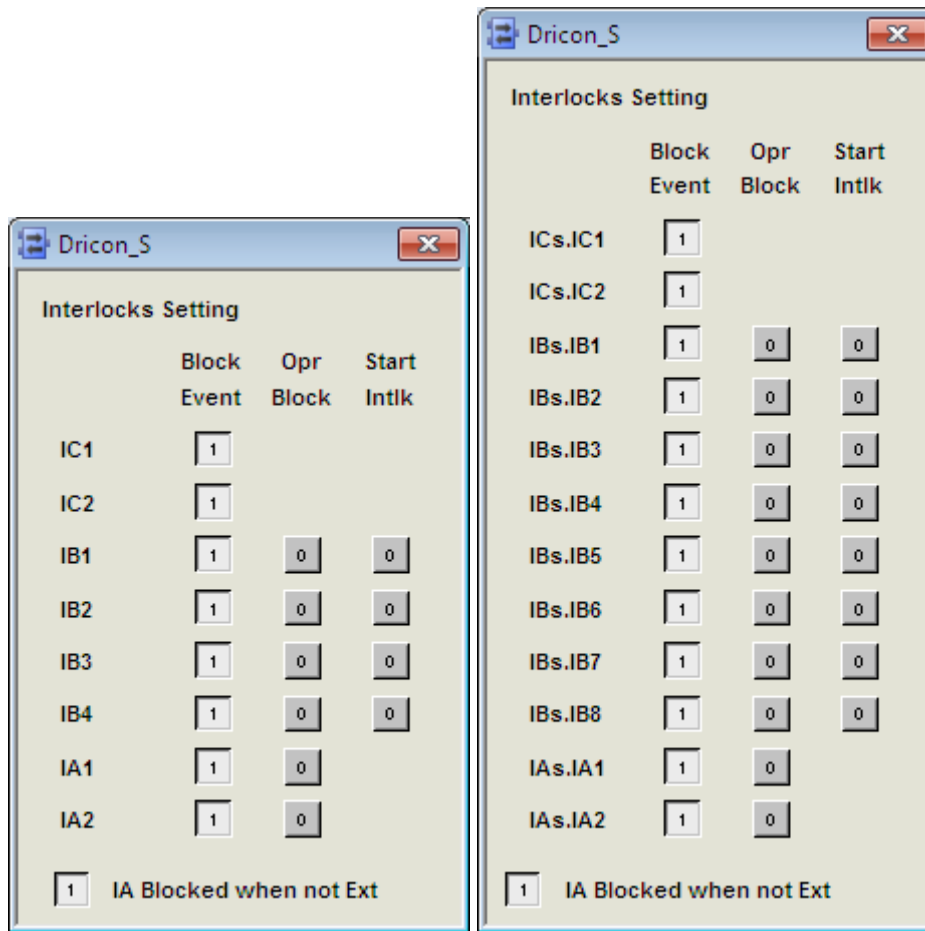


Figure 4-5 Interlock Settings.

5.13.6 Drive settings

Drive nominal (rated) current, torque and temperature is entered in this window.

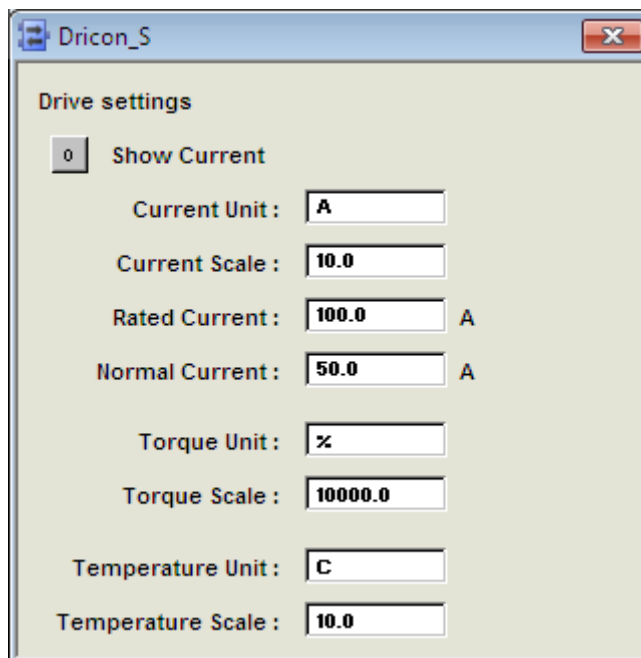


Figure 4-6 Drive settings.

5.13.7 Texts

The different interlock and information texts are entered in the aspect Text Properties. The length of the text is limited to about 60 characters, by the size of presentation element in the Interlock Display.

Name	Value	Type	Description	Readable?	R/Permission	Writable?	W/Permission	Deploy Scheme
M1Text	Control Voltage	String	M1 Text	Yes		Yes	Configure	Always Repla
IC1Text		String	IC1 Interlock Text	Yes		Yes	Configure	Always Repla
IC2Text		String	IC2 Interlock Text	Yes		Yes	Configure	Always Repla
ICs								
IC1Text		String	ICs.IC1 Interlock Te	Yes		Yes	Configure	Always Repla
IC2Text		String	ICs.IC2 Interlock Te	Yes		Yes	Configure	Always Repla
IB1Text		String	IB1 Interlock Text	Yes		Yes	Configure	Always Repla
IB2Text		String	IB2 Interlock Text	Yes		Yes	Configure	Always Repla
IB3Text		String	IB3 Interlock Text	Yes		Yes	Configure	Always Repla
IB4Text		String	IB4 Interlock Text	Yes		Yes	Configure	Always Repla
IBs								
IB1Text		String	IBs.IB1 Interlock Te	Yes		Yes	Configure	Always Repla
IB2Text		String	IBs.IB2 Interlock Te	Yes		Yes	Configure	Always Repla
IB3Text		String	IBs.IB3 Interlock Te	Yes		Yes	Configure	Always Repla
IB4Text		String	IBs.IB4 Interlock Te	Yes		Yes	Configure	Always Repla
IB5Text		String	IBs.IB5 Interlock Te	Yes		Yes	Configure	Always Repla
IB6Text		String	IBs.IB6 Interlock Te	Yes		Yes	Configure	Always Repla
IB7Text		String	IBs.IB7 Interlock Te	Yes		Yes	Configure	Always Repla
IB8Text		String	IBs.IB8 Interlock Te	Yes		Yes	Configure	Always Repla
IA1Text		String	IA1 Interlock Text	Yes		Yes	Configure	Always Repla
IA2Text		String	IA2 Interlock Text	Yes		Yes	Configure	Always Repla
IAS								
IA1Text		String	IAS.IA1 Interlock Te	Yes		Yes	Configure	Always Repla
IA2Text		String	IAS.IA2 Interlock Te	Yes		Yes	Configure	Always Repla
RunInt1Text		String	RunInt1 Interlock Te	Yes		Yes	Configure	Always Repla
RunInt2Text		String	RunInt2 Interlock Te	Yes		Yes	Configure	Always Repla
ExtSPName		String	ExtSP Name	Yes		Yes	Configure	Always Repla
Info1Text		String	Info 1 Text	Yes		Yes	Configure	Always Repla
Info2Text		String	Info 2 Text	Yes		Yes	Configure	Always Repla

Figure 4-7 Texts.

5.13.8 Ranges & Settings

If SP Start Value Enable is set to 1 the Manual SP will be set to SP Min when the motor is stopped.

Dricon_S

Ranges & Settings

MV Max :

MV Min :

MV Unit :

Decimal :

SP HLim :

SP LLim :

SP Start Value Enable

Figure 4-8 Ranges & Settings.

5.13.9 Maintenance

The screenshot shows a software window titled "Dricon_S" with a close button in the top right corner. The window contains a "Maintenance" section with the following settings:

- Enable No of Start counter : 0
- No of starts:
- Enable Run Time counter : 0
- Run Time : mins
- Reset Counters : 0

6. Operator Functions

The Operator functions are divided in principle into 4 parts:

- Presentation (Display elements, Time logged properties)
- Faceplate (Dialog)
- Alarm and Event handling
- Text handling

6.1 Display elements

Display elements which can be used for different display types are available for use in the functional unit DRICON_S.

The display elements show the status and the controls of the process with different degrees of detail and is intended for the following displays:

- Object display
- Diagnostic display
- Process display
- Interlock display

Examples of different display elements which could be used in these displays are given in the following sections.

6.1.1 Object Display

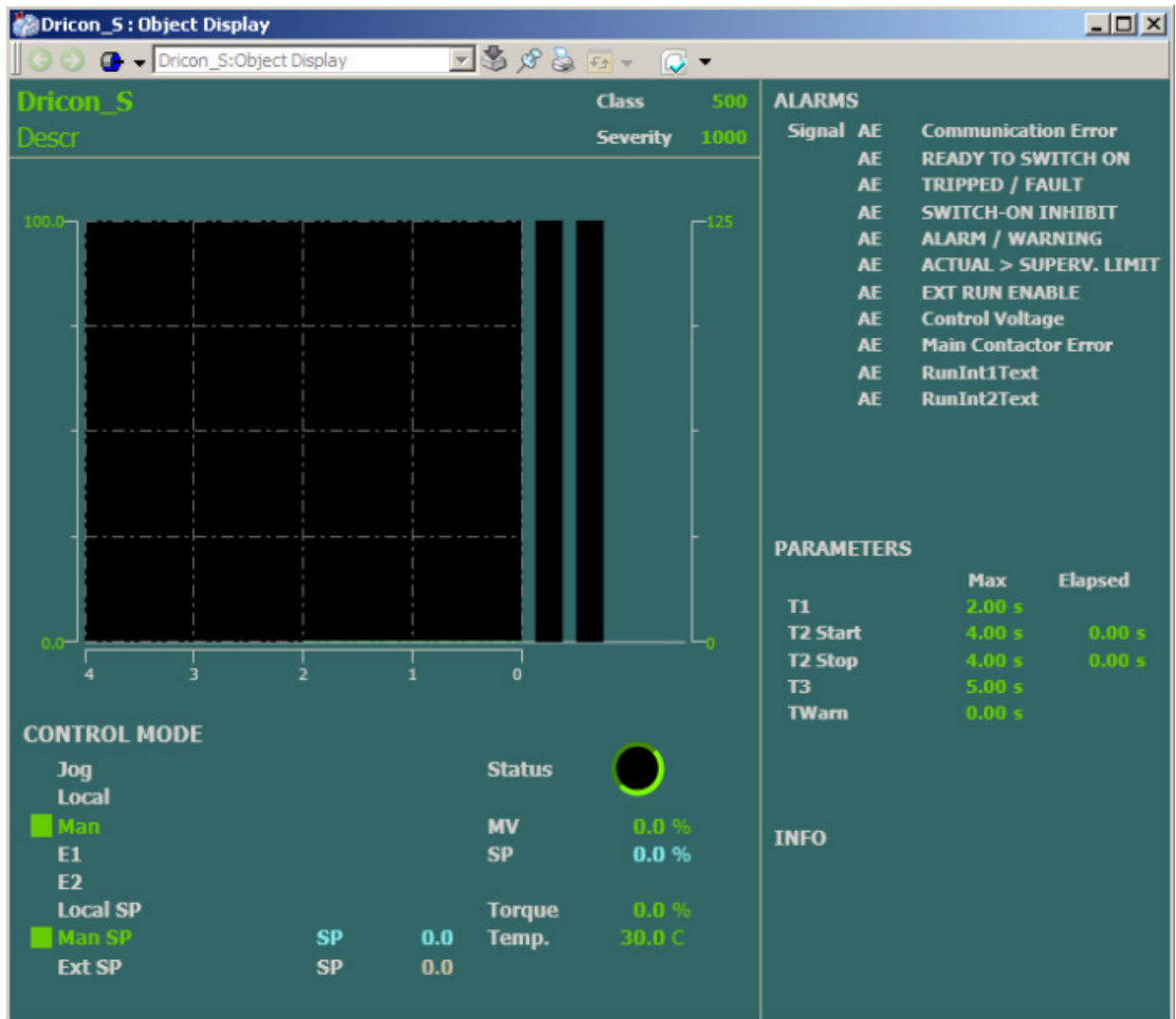


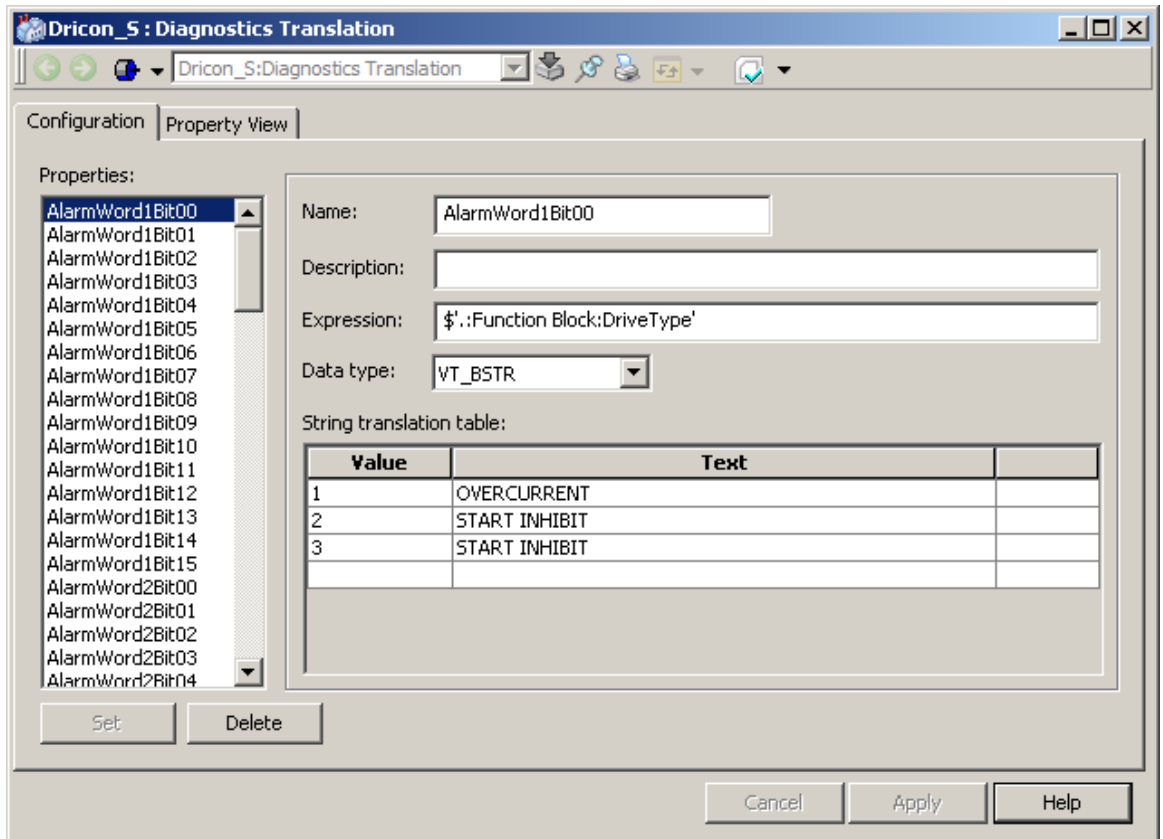
Figure 5-1 Object Display

6.1.2 Diagnostic Display

The extended status information from the Drive unit is showed in a Diagnostic Display. The information showed in the display is controlled by the value of the input parameter Drive Type on the Function Block

The information in the Diagnostic display is configured in an aspect stored in the Object Type Structure. It is possible to change the configuration to adapt the information if needed. If changes are done in this aspect the changes will affect all instances of the object.

If a change should be done to only one object, then the changes has to be done in the aspect stored in the Control Structure.



ACS550 Diagnostics

Alarm Word 1	Fault Word 1	Status Word
OVERCURRENT	OVERCURRENT	<input checked="" type="checkbox"/> READY TO SWITCH ON
OVERVOLTAGE	DC OVERVOLT	READY TO OPERATE
UNDERVOLTAGE	DEV OVERTEMP	OPERATION ENABLED
DIRLOCK	SHORT CIRC	TRIPPED / FAULT
COMM LOSS	-	OFF2 INACTIVE
AI1 LOSS	DC UNDERVOLT	OFF3 INACTIVE
AI2 LOSS	AI1 LOSS	SWITCH-ON INHIBIT
PANEL LOSS	AI2 LOSS	ALARM / WARNING
DEVICE OVERTEMP	MOT OVERTEMP	ACTUAL = REF. VALUE
MOTOR TEMP	PANEL LOSS	<input checked="" type="checkbox"/> REMOTE CONTROL
-	ID RUN FAIL	ACTUAL > SUPERV. LIMIT
MOTOR STALL	MOTOR STALL	EXT2 CONTROL
AUTORESET	CB OVERTEMP	<input checked="" type="checkbox"/> EXT RUN ENABLE
PFC AUTOCHANGE	EXT FAULT 1	-
PFC ILOCK	EXT FAULT 2	-
-	EARTH FAULT	-

Alarm Word 2	Fault Word 2	Control Word
OFF BUTTION	Obselete	OFF1 CONTROL
PID SLEEP	THERM FAIL	<input checked="" type="checkbox"/> OFF2 CONTROL
ID RUN	OPEX LINK	<input checked="" type="checkbox"/> OFF3 CONTROL
-	OPEX PWR	ENABLE OPERATION
START ENABLE 1	CURR MEAS	<input checked="" type="checkbox"/> RAMP OUT
START ENABLE 2	SUPPLY PHASE	<input checked="" type="checkbox"/> ENABLE RAMP FUNCTION
EMERGENCY STOP	ENCODER ERR	<input checked="" type="checkbox"/> RAMP IN
ENCODER ERROR	OVERSPEED	RESET
FIRST START	-	-
-	DRIVE ID	-
USER LOAD CURVE	CONFIG FILE	<input checked="" type="checkbox"/> REMOTE COMMAND
START DELAY	SERIAL 1 ERR	EXT2 CONTROL
-	EFB CON FILE	-
-	FORCE TRIP	-
-	MOTOR PHASE	-
-	OUTP WIRING	-

Dricon_S_1 : Diagnostics Display

Dricon_S_1:Diagnostics Display

ACS600 Diagnostics

<p>-Alarm Word 1-</p> <ul style="list-style-type: none"> START INHIBIT - - MOTOR TEMP ACx 600 TEMP ENCODER ERR T MEAS ALM - - - - COMM MODULE THERMISTOR EARTH FAULT - 	<p>-Fault Word 1-</p> <ul style="list-style-type: none"> SHORT CIRC OVERCURRENT DC OVERVOLT ACx600 TEMP EARTH FAULT THERMISTOR MOTOR TEMP SYSTEM FAULT UNDERLOAD OVERFREQ - - - - - 	<p>-Status Word-</p> <ul style="list-style-type: none"> ■ READY TO SWITCH ON READY TO OPERATE OPERATION ENABLED TRIPED / FAULT OFF2 INACTIVE OFF3 INACTIVE SWITCH-ON INHIBIT ALARM / WARNING ACTUAL = REF. VALUE ■ REMOTE CONTROL ACTUAL > SUPERV. LIMIT EXT2 CONTROL ■ EXT RUN ENABLE - - COMM ERROR
<p>-Alarm Word 2-</p> <ul style="list-style-type: none"> - UNDERLOAD - DC UNDERVOLT DC OVERVOLT OVERCURRENT OVERFREQ ALM (OS_16) ALM (OS_17) MOTOR STALL AI < MIN FUNC - - PANEL LOSS - - 	<p>-Fault Word 2-</p> <ul style="list-style-type: none"> SUPPLY PHASE NO MOT DATA DC UNDERVOLT - RUN DISABLED ENCODER FLT I/O COMM AMBIENT TEMP EXTERNAL FLT OVER SWFREQ AI < MIN FUNC PPCC LINK COMM MODULE PANEL LOSS MOTOR STALL MOTOR PHASE 	<p>-Control Word-</p> <ul style="list-style-type: none"> OFF1 CONTROL ■ OFF2 CONTROL ■ OFF3 CONTROL ENABLE OPERATION ■ RAMP OUT ■ ENABLE RAMP FUNCTION ■ RAMP IN RESET INCHING 1 INCHING 2 ■ REMOTE COMMAND EXT2 CONTROL - - -

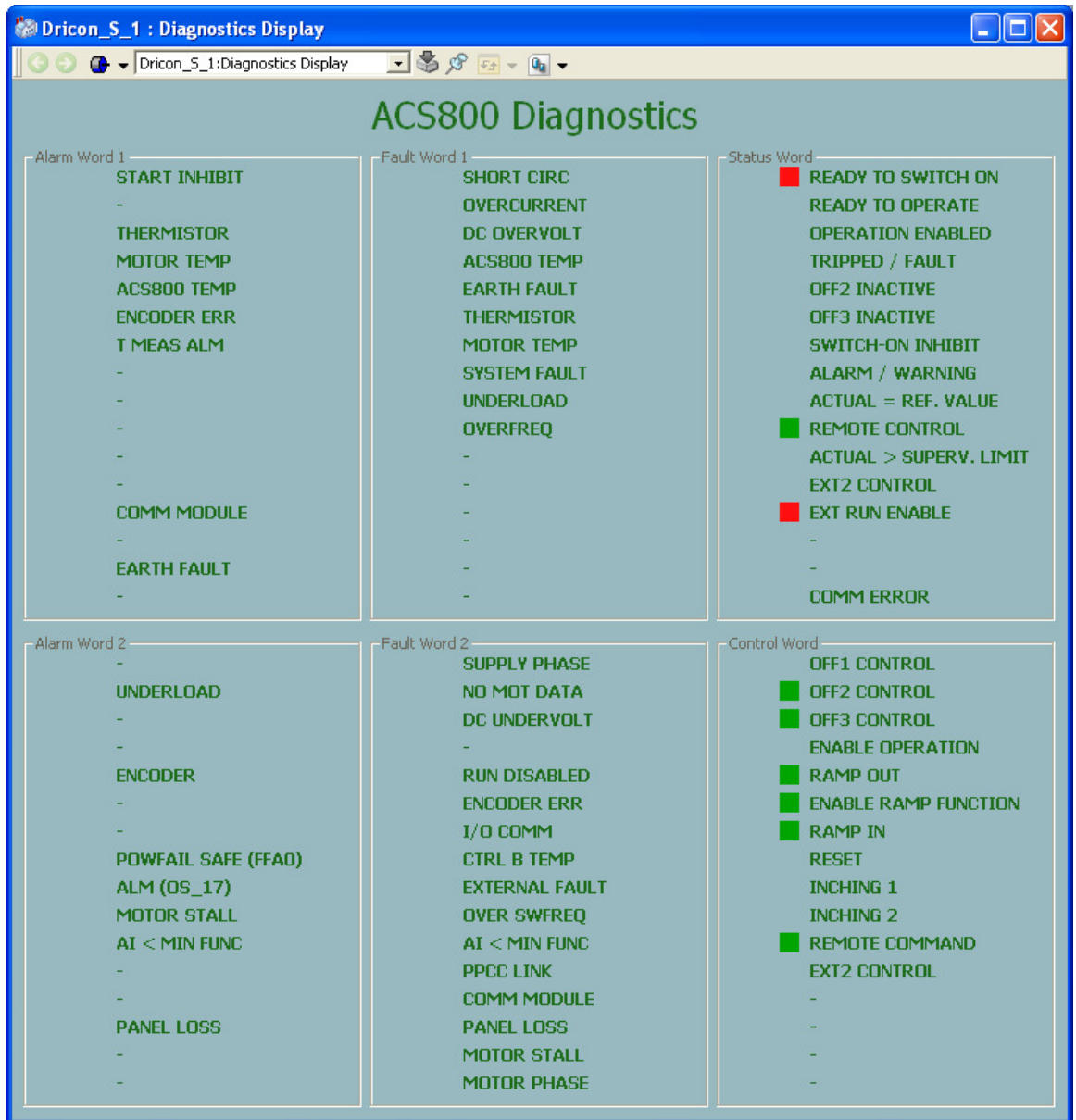


Figure 5-2 Diagnostic Display

6.1.3 Process Display



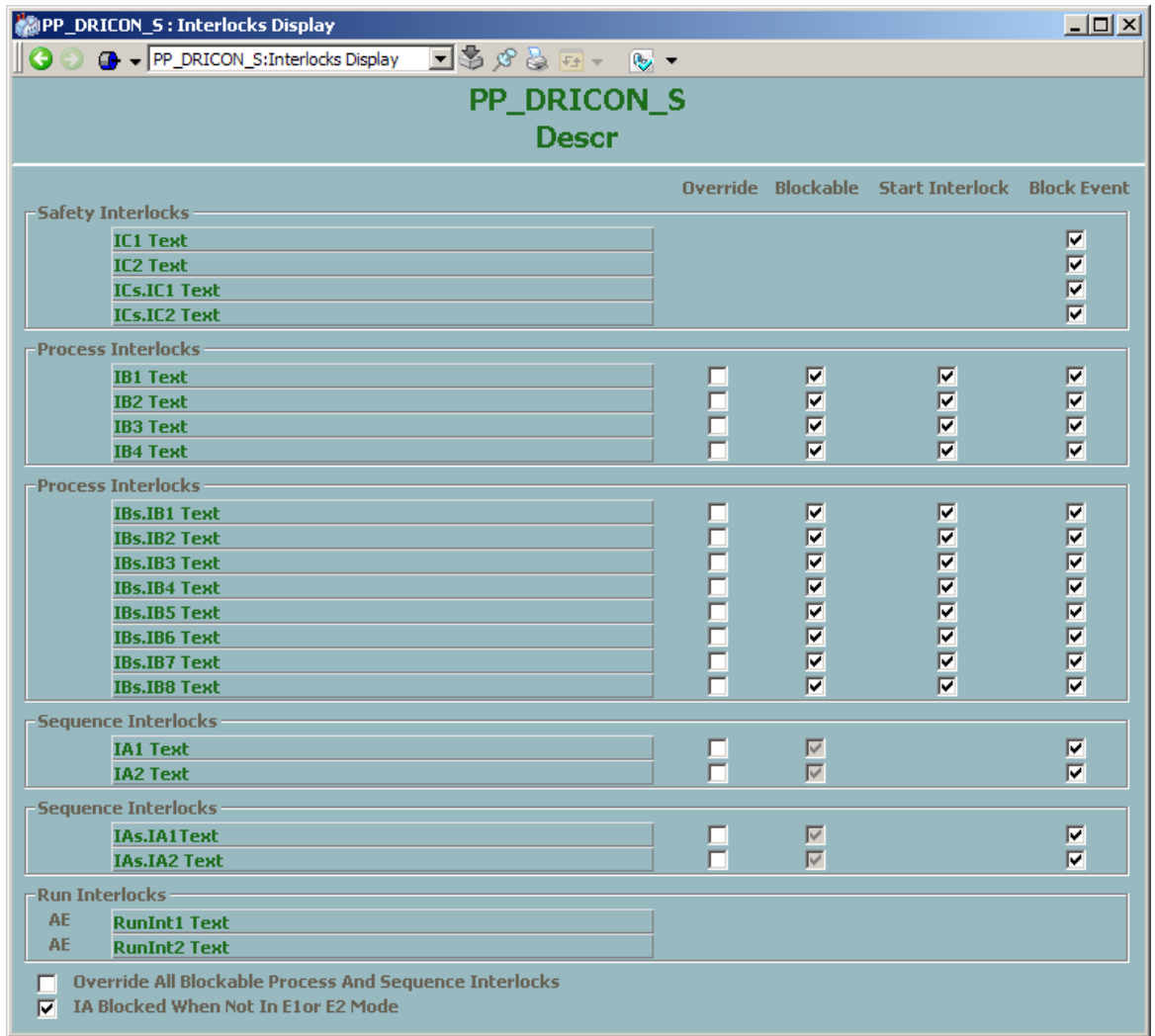
Figure 5-3 Process Display Element.

6.1.4 Interlock Display

This display shows the actual status of all Interlock. The operator can override individual interlocks or all interlock.

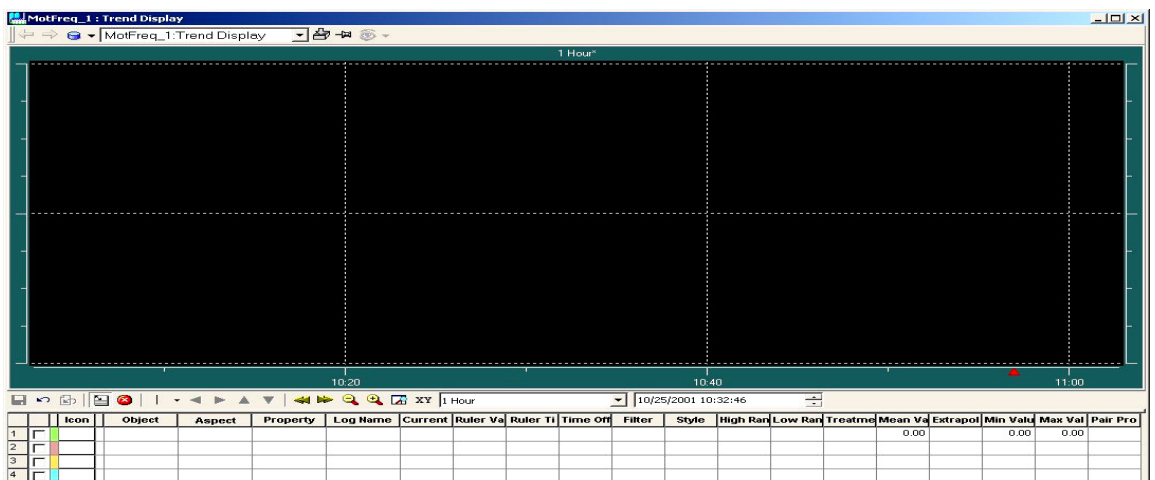
Interlocks that can be overridden must be set to Blockable. This can be done from this display if the user has permission Configure or from the Interaction Window see chapter 5.13.5

Start Interlock, Block Event and IA Blocked when no in E1 or E2 mode are parameters that can be set from this display if the user has Permission Configure or from Interaction Window.



6.2 Time-logged Properties

Measured values stored can be presented graphically in the form of curves on the display screen. Such a display, a **trend display**, can consist of 1-4 curves. All properties for the object DRICON_S are available to be logged on the trend curves.



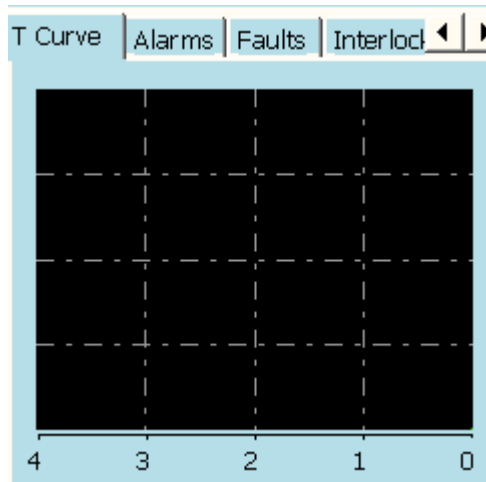


Figure 5-4 Trend Display

6.3 Faceplate (Dialog)

The display screen is supplemented with a mouse and keyboard for operator communication with the functional unit/object.

By using OperateIT the operator can view and control the process through faceplates. The dialogue consists of buttons, indicators and graphic presentations within a Faceplate. A faceplate has three levels of dialogue which are presented by the following three runtime views:

- Reduced Faceplate, where the size and contents typically have been optimized to cover most of the normal process operator actions. Minimum dialogue.
- Faceplate, which typically covers all normal process operator actions.
- Extended Faceplate, with functions and information intended for the process engineer or the advanced operator. Maximum dialogue

The figures 5-5 to 5-14 below and overleaf illustrate the various presentations of the faceplate.

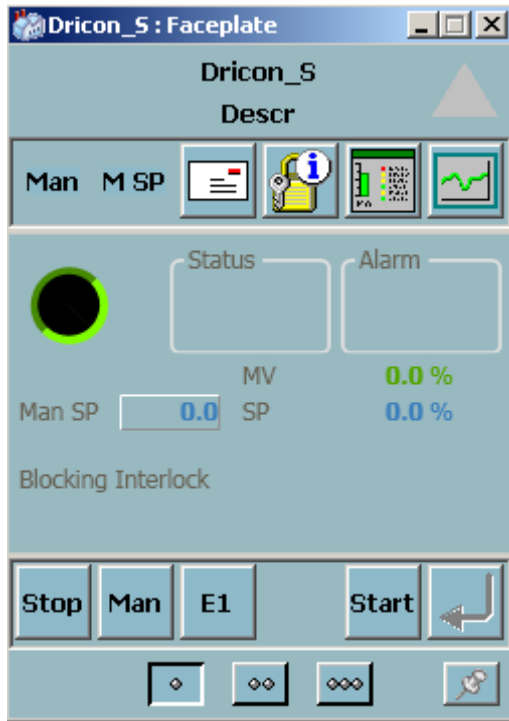


Figure 5-5 Reduced Faceplate

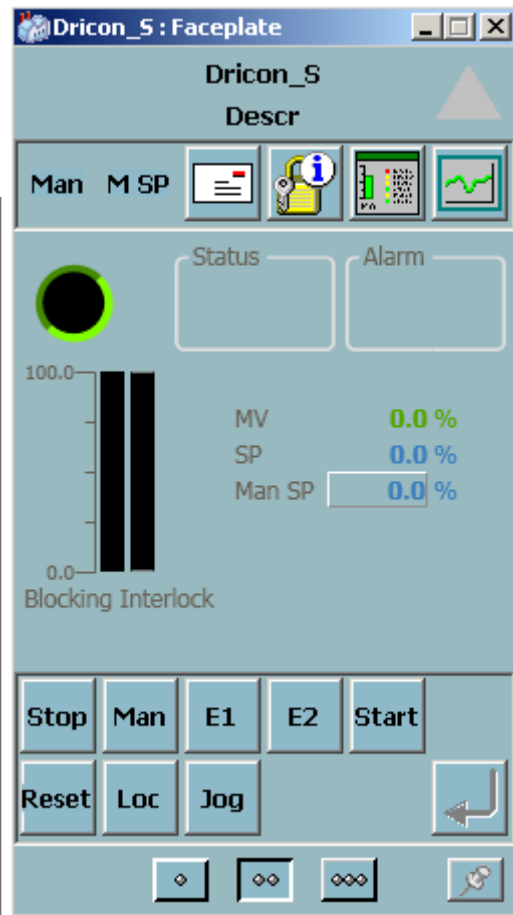


Figure 5-6 Faceplate

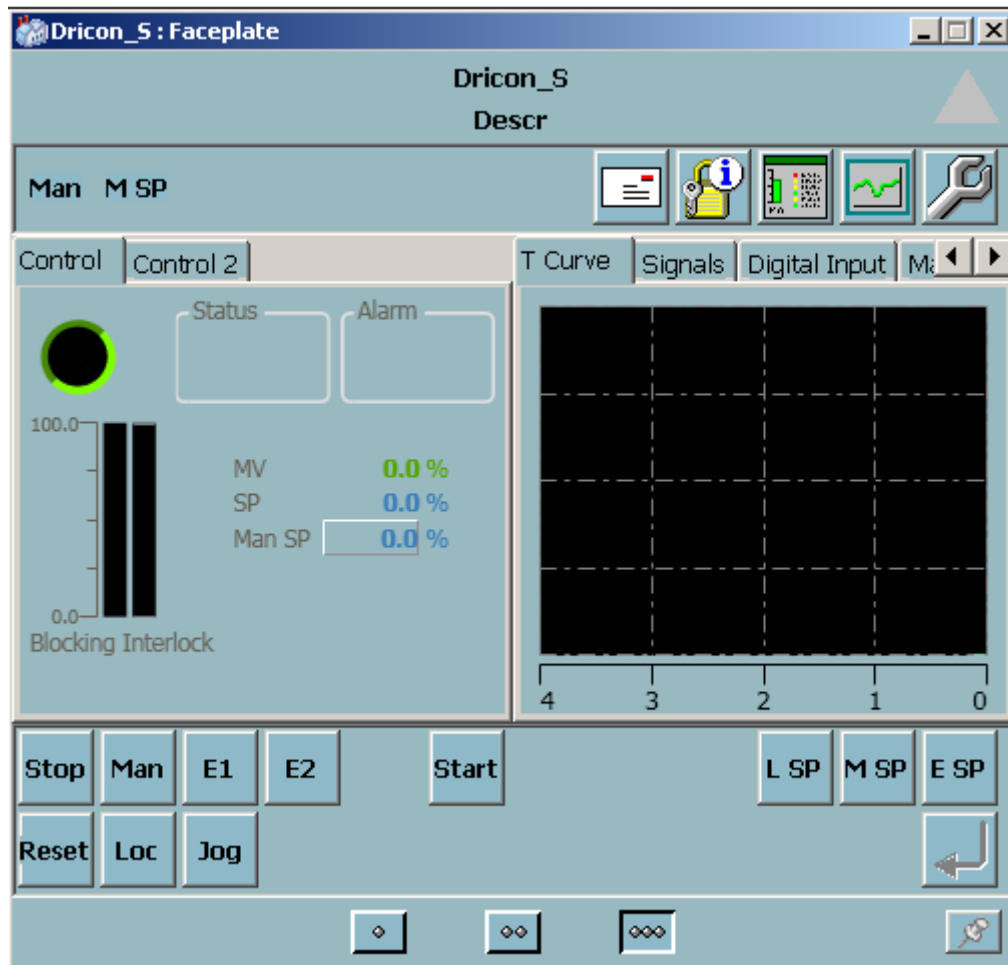


Figure 5-7 Extended Faceplate

6.4 Alarm and Event Handling

6.4.1 General

This section contains a description of all alarms and events in the functional unit DRICON_S.

When a motor fails an alarm and an event is generated and can be viewed on the Operate^{IT} Operator Station. The alarms are indicated in the faceplate, object display and in the alarm and event list.

The possibilities of the operator to block event printouts and alarms are shown under the heading 'Event and alarm blocking' below.

The alarm handling for DRICON_S can be controlled individually for the different types of fault, which can develop. See section 4.14 describing the Interaction Window. Note, that the Function Block itself blocks certain alarms in a number of situations. For example RunInt1 and RunInt2 are blocked with the motor at standstill.

Process interlocks do not appear on the alarm and event lists.

The time stamping of the alarm is done when the function block is executed.

Event Time	Object Name	Object Description	Condition	Message Description
02-05-24 03:46:16.763	264M500.RUN	Pulp Mixer Running	Status	Alarm
02-05-24 01:13:04.785	192.168.0.51-0.11.5		HWError	For info see 'Errors and
02-05-24 00:22:18.784	192.168.0.51-0.11.4		HWError	For info see 'Errors and
02-05-23 23:32:31.458	500F1920	Washing Pulp Flow	AI_Err	Alarm
02-05-23 23:32:31.458	500F1920	Washing Pulp Flow	MV_L1	Alarm
02-05-23 23:32:31.458	500F1920	Washing Pulp Flow	MV_L2	Alarm
02-05-23 23:23:01.784	192.168.0.51-0.11.3		HWError	For info see 'Errors and
02-05-23 20:00:07.762	500F1920	Washing Pulp Flow	MV_L2	Alarm
02-05-23 01:38:52.762	500F1920	Washing Pulp Flow	MV_L1	Alarm
02-05-23 00:18:26.995	500F1920	Washing Pulp Flow	AI_Err	Alarm
02-05-22 00:10:00.709	Mot01	Test Mot01	ControlV	Alarm
02-05-20 17:32:45.784	192.168.0.51-0.11.2		HWError	For info see 'Errors and

Figure 5-8 Alarm List

6.4.2 General Alarm Message

The following alarm texts are generated by the functional unit DRICON_S. The “Condition” text are stored in the Alarm and Event Translator aspect and can be NLS handled.

“Message Description” is “hard coded” in the function block and can not be modified.

Object Name	Object Description	Condition	Message Description
<Name>	<Description>	CommErr	Fault
<Name>	<Description>	Drive Power is OFF	Fault
<Name>	<Description>	External Run Not Enabled	Fault
<Name>	<Description>	Fault	Fault
<Name>	<Description>	Warning	Alarm
<Name>	<Description>	Switch-On Inhibit	Fault
<Name>	<Description>	Actual Value > Supervision Limit	Fault
<Name>	<Description>	Run Interlock 1	Run1 text from Interaction Window
<Name>	<Description>	Run Interlock 2	Run1 text from Interaction Window
<Name>	<Description>	Control Voltage	Fault
<Name>	<Description>	Main Contactor	Fault

6.4.3 General Event Message

The following Event texts are generated by the functional unit DRICON_S.

The “Message Description” text are stored in the Alarm and Event Translator aspect and can be NLS handled.

SourceName	ObjectDescription	Condition	Message Description
<Name>	<Description>		SeqE1 Mode
<Name>	<Description>		SeqE2 Mode
<Name>	<Description>		SeqMan Mode
<Name>	<Description>		Local Mode
<Name>	<Description>		Panel Mode
<Name>	<Description>		Remote Mode
<Name>	<Description>		SeqManSp
<Name>	<Description>		SeqExtSp
<Name>	<Description>		Ext Start
<Name>	<Description>		Ext Stop
<Name>	<Description>		IC1 On
<Name>	<Description>		IC1 Off
<Name>	<Description>		IC2 On
<Name>	<Description>		IC2 Off
<Name>	<Description>		IB1 On
<Name>	<Description>		IB1 Off
<Name>	<Description>		IB2 On
<Name>	<Description>		IB2 Off
<Name>	<Description>		IB3 On
<Name>	<Description>		IB3 Off
<Name>	<Description>		IB4 On
<Name>	<Description>		IB4 Off
<Name>	<Description>		IA1 On
<Name>	<Description>		IA1 Off
<Name>	<Description>		IA2 On
<Name>	<Description>		IA2 Off
<Name>	<Description>		Run On
<Name>	<Description>		Run Off
<Name>	<Description>		Alarm Acknowledge
<Name>	<Description>		Alarm Control Block

6.4.4 Event Message specific for AC550

The following Event texts are generated by the functional unit DRICON_S.

The “Message Description” text are stored in the Alarm and Event Translator aspect and can be NLS handled.

SourceName	ObjectDescription	Condition	Message Description
<Name>	<Description>		DEV OVERTEMP
<Name>	<Description>		CURR MEAS
<Name>	<Description>		EXT FAULT 1
<Name>	<Description>		EMERGENCY STOP
<Name>	<Description>		AI2 LOSS
<Name>	<Description>		MOTOR STALL
<Name>	<Description>		DEVICE OVERTEMP
<Name>	<Description>		SUPPLY PHASE
<Name>	<Description>		OUTP WIRING
<Name>	<Description>		EART FAULT
<Name>	<Description>		MOTOR STALL
<Name>	<Description>		OVERVOLTAGE
<Name>	<Description>		ID RUN
<Name>	<Description>		MOTOR PHASE
<Name>	<Description>		COMM LOSS
<Name>	<Description>		ENCODER ERR
<Name>	<Description>		USER LOAD CURVE
<Name>	<Description>		AI1 LOSS
<Name>	<Description>		Obselete
<Name>	<Description>		FIRST START
<Name>	<Description>		PANEL LOSS
<Name>	<Description>		AI1 LOSS
<Name>	<Description>		CONFIG FILE
<Name>	<Description>		OVERSPEED
<Name>	<Description>		START ENABLE 2
<Name>	<Description>		START ENABLE 1
<Name>	<Description>		EFB CON FILE

SourceName	ObjectDescription	Condition	Message Description
<Name>	<Description>		OPEX PWR
<Name>	<Description>		ID RUN FAIL
<Name>	<Description>		START DELAY
<Name>	<Description>		PID SLEEP
<Name>	<Description>		OFF BUTTON
<Name>	<Description>		THERM FAIL
<Name>	<Description>		FORCE TRIP
<Name>	<Description>		OPEX LINK
<Name>	<Description>		UNDERVOLTAGE
<Name>	<Description>		OVERCURRENT
<Name>	<Description>		ENCODER ERROR
<Name>	<Description>		EXT FAULT 2
<Name>	<Description>		CB OVERTEMP
<Name>	<Description>		PFC ILOCK
<Name>	<Description>		DIRLOCK
<Name>	<Description>		MOT OVERTEMP
<Name>	<Description>		DRIVE ID
<Name>	<Description>		PFC AUTOCHANGE
<Name>	<Description>		AUTORESET
<Name>	<Description>		DC OVERVOLT
<Name>	<Description>		SHORT CIRC

6.4.5 Event Message specific for AC600

The following Event texts are generated by the functional unit DRICON_S.

The “Message Description” text are stored in the Alarm and Event Translator aspect and can be NLS handled.

SourceName	ObjectDescription	Condition	Message Description
<Name>	<Description>		UNDERLOAD
<Name>	<Description>		DC OVERVOLT
<Name>	<Description>		OVERFREQ
<Name>	<Description>		THERMISTOR
<Name>	<Description>		ENCODER ERR
<Name>	<Description>		PANEL LOSS
<Name>	<Description>		I/O COMM
<Name>	<Description>		AI < MIN FUNC
<Name>	<Description>		THERMISTOR
<Name>	<Description>		DC OVERVOLT
<Name>	<Description>		UNDERLOAD
<Name>	<Description>		DC UNDERVOLT
<Name>	<Description>		PANEL LOSS
<Name>	<Description>		MOTOR TEMP
<Name>	<Description>		MOTOR PHASE
<Name>	<Description>		NO MOT DATA
<Name>	<Description>		SYSTEM FAULT
<Name>	<Description>		EXTERNAL FLT
<Name>	<Description>		SHORT CIRC
<Name>	<Description>		ALM (A_17)
<Name>	<Description>		MOTOR TEMP
<Name>	<Description>		MOTOR STALL
<Name>	<Description>		ACx 600 TEMP
<Name>	<Description>		SUPPLY PHASE
<Name>	<Description>		EARTH FAULT
<Name>	<Description>		OVERCURRENT
<Name>	<Description>		OVERCURRENT

SourceName	ObjectDescription	Condition	Message Description
<Name>	<Description>		START INHIBIT
<Name>	<Description>		OVERFREQ
<Name>	<Description>		EARTH FAULT
<Name>	<Description>		AMBIENT TEMP
<Name>	<Description>		AI < MIN FUNC
<Name>	<Description>		ENCODER FLT
<Name>	<Description>		T MEAS ALM
<Name>	<Description>		DC UNDERVOLT
<Name>	<Description>		PPCC LINK
<Name>	<Description>		ALM (A_16)
<Name>	<Description>		MOTOR STALL
<Name>	<Description>		RUN DISABLED
<Name>	<Description>		ACx 600 TEMP
<Name>	<Description>		COMM MODULE
<Name>	<Description>		OVER SWFREQ
<Name>	<Description>		COMM MODULE

6.4.6 Event Message specific for AC800

The following Event texts are generated by the functional unit DRICON_S.

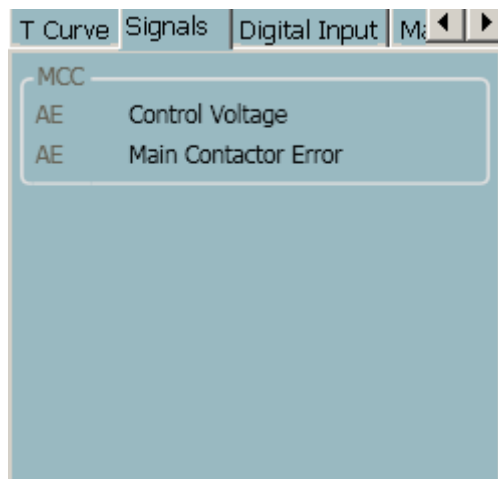
The “Message Description” text are stored in the Alarm and Event Translator aspect and can be NLS handled.

SourceName	ObjectDescription	Condition	Message Description
<Name>	<Description>		THERMISTOR
<Name>	<Description>		UNDERLOAD
<Name>	<Description>		OVER SWFREQ
<Name>	<Description>		MOTOR TEMP
<Name>	<Description>		SUPPLY PHASE
<Name>	<Description>		ACS800 TEMP
<Name>	<Description>		PPCC LINK
<Name>	<Description>		DC UNDERVOLT
<Name>	<Description>		COMM MODULE
<Name>	<Description>		RUN DISABLED
<Name>	<Description>		ENCODER ERR
<Name>	<Description>		PANEL LOSS
<Name>	<Description>		I/O COMM
<Name>	<Description>		PANEL LOSS
<Name>	<Description>		AI < MIN FUNC
<Name>	<Description>		DC OVERVOLT
<Name>	<Description>		SHORT CIRC
<Name>	<Description>		EART FAULT
<Name>	<Description>		COMM MODULE
<Name>	<Description>		UNDERLOAD
<Name>	<Description>		ENCODER ERR
<Name>	<Description>		AI < MIN FUNC
<Name>	<Description>		MOTOR STALL
<Name>	<Description>		SYSTEM FAULT
<Name>	<Description>		ENCODER
<Name>	<Description>		POWFAIL SAFE (FFA0)
<Name>	<Description>		MOTOR PHASE

SourceName	ObjectDescription	Condition	Message Description
<Name>	<Description>		OVER CURRENT
<Name>	<Description>		T MEAS ALM
<Name>	<Description>		THERMISTOR
<Name>	<Description>		OVERFREQ
<Name>	<Description>		CTRL B TEMP
<Name>	<Description>		MOTOR STALL
<Name>	<Description>		EARTH FAULT
<Name>	<Description>		MOTOR TEMP
<Name>	<Description>		ACS800 TEMP
<Name>	<Description>		EXTERNAL FAULT
<Name>	<Description>		START INHIBIT
<Name>	<Description>		NO MOT DATA
<Name>	<Description>		ALM (OS_17)

6.5 Faceplate Tabs

6.5.1 Signals



6.5.2 Alarm Block

By using the faceplate it is possible for the process engineer to block.

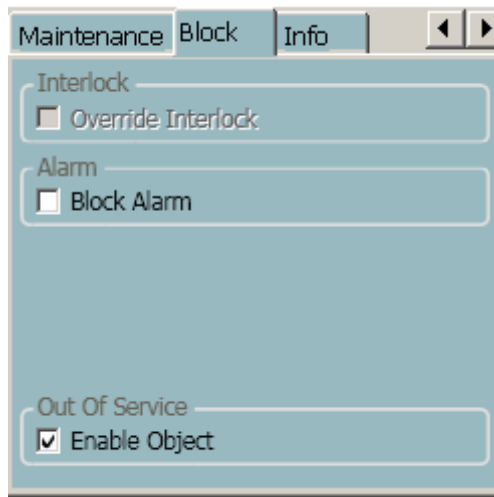


Figure 5-10 Extended Faceplate Element (Block)

6.5.3 Digital Inputs

The status of the Digital Inputs collected in the PPO Type 5 variable DigitalInputs1 is showed in this tab. The text is defined in the aspect Diagnostic Translation.

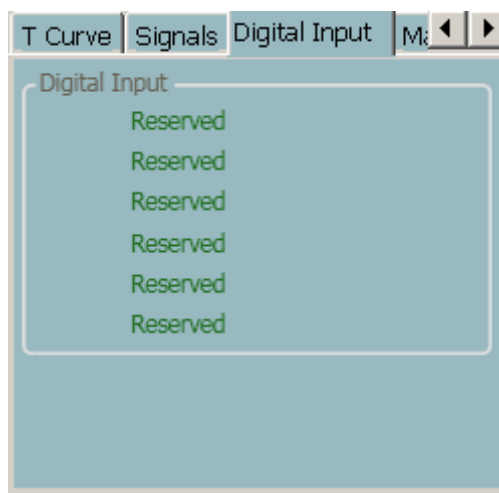


Figure 5-11 Extended Faceplate Element (Digital Input)

6.5.4 Info text

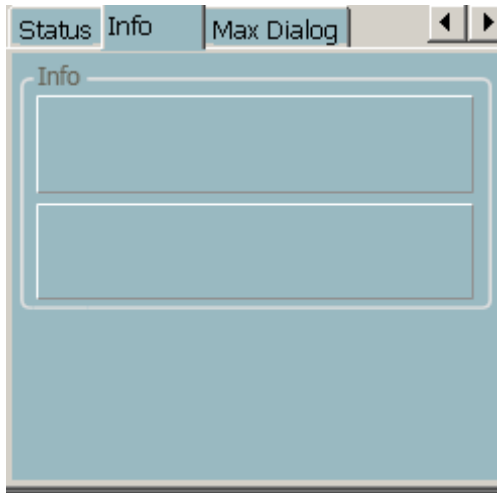


Figure 5-12 Extended Faceplate Element (Info)

6.5.5 Maintenance

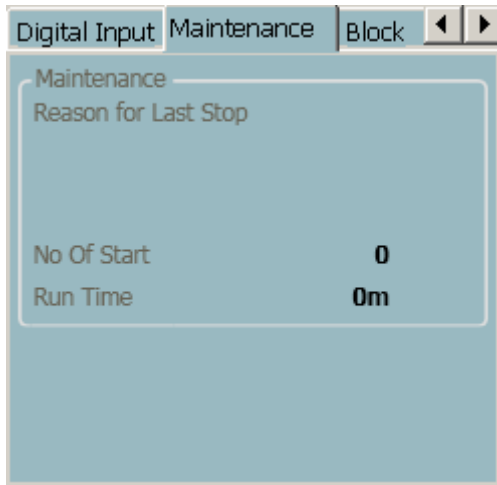


Figure 5-13 Extended Faceplate Element (Digital Maintenance)

7. Drive Configuration

For detailed information of drive configuration see:

Firmware Manual 3AFY 61201441 R0625

Standard Application Program 7.x for ACS 800 Frequency Converters

7.1 Parameter Group Configuration

The ABB drives units are identified in the controller by their respective cluster and position address on the ModuleBus.

To establish the communication between the ABB drives and AC 800M, at least the following parameter groups shall be considered to be reconfigured in the ABB drive systems.

Parameter Group	Parameter Name	Setting
10.1	Ext1 Strt/Stp Dir	COMM. MODULE (CW)
10.2	Ext2 Strt/Stp Dir	COMM. MODULE (CW)
10.3	Direction	Request
11.2	Ext1/Ext2 Select	COMM. MODULE (CW)
11.3	EXT REF1 Select	COMM. REF or FAST COMM
11.6	EXT REF2 Select	COMM. REF or FAST COMM
16.1	RUN Enable	Yes or COMM. MODULE (CW)
16.4	Fault Reset Select	COMM. MODULE (CW)
30.18	COMM FLT Function	Fault
70.1	Channel 0 Addr	See Drives Addressing in the online help for Control Builder M
98.2	COMM. MODULE Link	Advant

7.2 Data from the Drive

The following parameter groups define the type of data you receive from the drive.
This is only an example and you may find other configuration that suits your purpose.

Parameter Group	Parameter Name	Setting
92.2	Main DS ACT1	102 (Speed) Max value 20000
92.3	Main DS ACT2	105 (Torque) Max value 10000
92.4	AUX DS ACT 3	305 (Fault word 1)
92.5	AUX DS ACT 4	308 (Alarm word 1)
92.6	AUX DS ACT 5	306 (Fault word 2)

7.3 Drive Supervision

To prevent the drive from tripping at nominal speed, the parameter 32.02 should be set at least 5% above nominal speed. Parameter 32.01 has no effect.

Parameter Group	Parameter Name	Setting
32.01	Speed 1 Function	NO, LOW LIMIT, HIGH LIMIT, ABS LOW LIMIT
32.02	Speed 1 Limit	- 18000 to 18000 rpm

8. Control Builder M Configuration

8.1 Connection for AC550

To connect AC550 with PPO Type 5 and to be able to reset any alarm in the Drive the highlighted connections have to be done according to below.

The order of the non highlighted connections is depending on the configuration in the Drive unit

Channel	Name	Type	Variable	I/O
IW1.4.0.0	In Parameter IC	dint	PP_Function.Motors.ACS550.InID	
IW1.4.0.1	In Parameter IN	dint		
IW1.4.0.2	In Parameter V	dint		
IW1.4.0.3	In Parameter V	dint		
QW1.4.0.4	Out Parameter	dint	PP_Function.Motors.ACS550.OutID	
QW1.4.0.5	Out Parameter	dint	PP_Function.Motors.ACS550.OutIND	
QW1.4.0.6	Out Parameter	dint	PP_Function.Motors.ACS550.OutVALHi	
QW1.4.0.7	Out Parameter	dint	PP_Function.Motors.ACS550.OutVALLo	
IW1.4.0.8	Status	dint	PP_Function.Motors.ACS550.DrvStat	
IW1.4.0.9	Speed Actual	dint	PP_Function.Motors.ACS550.Act1	
IW1.4.0.10	Actual 3	dint	PP_Function.Motors.ACS550.Curr	
IW1.4.0.11	Actual 4	dint	PP_Function.Motors.ACS550.Torq	
IW1.4.0.12	Actual 5	dint	PP_Function.Motors.ACS550.Temp	
IW1.4.0.13	Actual 6	dint	PP_Function.Motors.ACS550.DigitalInput1	
IW1.4.0.14	Actual 7	dint	PP_Function.Motors.ACS550.DigitalInput2	
IW1.4.0.15	Actual 8	dint	PP_Function.Motors.ACS550.Act4	
IW1.4.0.16	Actual 9	dint	PP_Function.Motors.ACS550.Act3	
IW1.4.0.17	Actual 10	dint	PP_Function.Motors.ACS550.Act5	
QW1.4.0.18	Command	dint	PP_Function.Motors.ACS550.DrvCmd	
QW1.4.0.19	Speed Ref	dint	PP_Function.Motors.ACS550.Ref1	
QW1.4.0.20	Ref 3	dint		
QW1.4.0.21	Ref 4	dint		

8.2 Connection for ACS600 and ACS800

The order of the connections is depending on the configuration in the Drive unit

Drive Parameter	Setting AC600/AC800
10.01 EXT1 STRT/STP/DIRv	COMM.CW
11.03 EXT REF1 SELECT	COMM. REF
16.01 RUN ENABLE	COMM.CW
16.04 FAULT RESET SEL	COMM.CW
98.02 COMM. MODULE LINK	FIELDBUS
98.07 COMM PROFILE	GENERIC

This is an example on the configuration of the Drive parameter 51 and corresponding value in the ACS600Std_Par

Drive Parmeter	Setting AC600/AC800	Hardware- Controller PPO Type5	ACS600Std_Par
51.01 MODULE TYPE			
51.02 NODE ADDRESS			
51.03 BAUDRATE			
51.04 PPO-TYPE			
51.05 PZD3 OUT			
51.06 PZD3 IN	Fault Word 1 305	Actual 3	Act 3
51.07 PZD4 OUT			
51.08 PZD4 IN	Alarm Word 1 308	Actual 4	Act 4
51.09 PZD5 OUT			
51.10 PZD5 IN	Fault Word 2 306	Actual 5	Act 5
51.11 PZD6 OUT			
51.12 PZD6 IN	Alarm Word 2 309	Actual 6	Act 6
51.13 RMIO Par			
51.14 PZD7 OUT			
51.15 PZD7 IN	DI6-1 Status 117	Actual 7	DigitalInput1
51.16 PZD8 OUT			
51.17 PZD8 IN	Current 104	Actual 8	Curr
51.18 PZD9 OUT			
51.19 PZD9 IN	Torque 105	Actual 9	Torq
51.20 PZD10 OUT			
51.21 PZD10 IN	Temp 110	Actual 10	Temp

Channel	Name	Type	Variable
IW1.2.0.0	In Parameter ID	DintIO	
IW1.2.0.1	In Parameter IND	DintIO	
IW1.2.0.2	In Parameter VAL Hi	DintIO	
IW1.2.0.3	In Parameter VAL Lo	DintIO	
QW1.2.0.4	Out Parameter ID	DintIO	
QW1.2.0.5	Out Parameter IND	DintIO	
QW1.2.0.6	Out Parameter VAL Hi	DintIO	
QW1.2.0.7	Out Parameter VAL Lo	DintIO	
IW1.2.0.8	Status	DintIO	PP_Libraries.PP_DriconS.DrvStat
IW1.2.0.9	Speed Actual	DintIO	PP_Libraries.PP_DriconS.Act1
IW1.2.0.10	Actual 3	DintIO	PP_Libraries.PP_DriconS.Act3
IW1.2.0.11	Actual 4	DintIO	PP_Libraries.PP_DriconS.Act4
IW1.2.0.12	Actual 5	DintIO	PP_Libraries.PP_DriconS.Act5
IW1.2.0.13	Actual 6	DintIO	PP_Libraries.PP_DriconS.Act6
IW1.2.0.14	Actual 7	DintIO	PP_Libraries.PP_DriconS.DigitalInput1
IW1.2.0.15	Actual 8	DintIO	PP_Libraries.PP_DriconS.Curr
IW1.2.0.16	Actual 9	DintIO	PP_Libraries.PP_DriconS.Torq
IW1.2.0.17	Actual 10	DintIO	PP_Libraries.PP_DriconS.Temp
QW1.2.0.18	Command	DintIO	PP_Libraries.PP_DriconS.DrvCmd
QW1.2.0.19	Speed Ref	DintIO	PP_Libraries.PP_DriconS.Ref1
QW1.2.0.20	Ref 3	DintIO	
QW1.2.0.21	Ref 4	DintIO	
QW1.2.0.22	Ref 5	DintIO	
QW1.2.0.23	Ref 6	DintIO	
QW1.2.0.24	Ref 7	DintIO	

Connections | Status | Unit Status

If Ref 2 is used the value is connected to Speed Ref. The drive panel must be configured that the connection is using % instead of Rpm.

Data Type - PP_ElementLib.AC5600Std_Par [Read-only]					
Editor Edit View Insert Tools Window Help					
	Name	Data Type	Attributes	Initial Valu	Description
1	DrvStat	dint	retain	0	Main Status Word from Drive.
2	Act1	dint	retain	0	Actual Value Speed (From Drive).
3	Act2	dint	retain	0	Actual Value Arbitrary (From Drive).
4	Act3	dint	retain	0	Actual Value Fault Word 1 (From Drive).
5	Act4	dint	retain	0	Actual Value Alarm Word 1 (From Drive).
6	Act5	dint	retain	0	Actual Value Fault Word 2 (From Drive).
7	Act6	dint	retain	0	Actual Value Alarm Word 2 (From Drive).
8	DigitalInput1	dint	retain	0	Actual Value Digital Input 1 (From Drive)
9	DigitalInput2	dint	retain	0	Actual Value Digital Input 2 (From Drive)
10	DrvCmd	dint	retain	0	Main Control Word to Drive.
11	Ref1	dint	retain	0	Reference value 1 (Rpm to Drive).
12	Ref2	dint	retain	0	Reference value 2 (% to Drive).
13	Ref3	dint	retain	0	Reference value 3 (To Drive).
14	Ref4	dint	retain	0	Reference value 4 (To Drive).
15	Ref5	dint	retain	0	Reference value 5 (To Drive).
16	InID	dint	retain	0	
17	OutID	dint	retain	0	
18	OutIND	dint	retain	0	
19	OutVALHi	dint	retain	0	
20	OutVALLo	dint	retain	0	
21	Curr	dint	retain	0	Actual Value for Current (From Drive)
22	Torq	dint	retain	0	Actual Value for Torque (From Drive)
23	Temp	dint	retain	0	Actual Value for Temperature (From Drive)

REVISION

Rev. ind.	Page (P) Chapt. (C)	Description	Date Dept./Init.
A		Rev. 2.0/0	020123 /MP
B	4, 5, 7	Initialization	04-04-14/FM
C		ACS550, Profibus status added	040708/MP
D	3, 6	Input/Output Terminals, Drive settings	050223/MP
E	4,5	Event handling added and Interaction Windows updated	050329/BP
F	4, 5	Rev 4.0/1, Faceplate	050902/MP
H	3, 3.3.1	Rev 4.0/2	060506/BP
I	4.10	Rev 4.0/5	070510/BP
J		Rev 5.0-1 Interlock functionality is updated	081120/BP
K		Update Rev 5.1/0	101102/BP