FOXBORO®

PSS 21H-6C1 B4

I/A Series® Hardware
Field Automation Subsystem
Micro-I/A™ Station Integrated Control Software

One of the available software licenses for a Micro-I/A station is the Integrated Control software. This software includes a full range of Foxboro process control function blocks that provide:

- Full capability for any application, with combined regulatory, batch and discrete functions
- Powerful, full featured algorithms and advanced control
- Advanced input/output capability
- Fast, reliable processing
- Object orientation of blocks with display connections to the blocks.

Additional supported functions include:

- Data acquisition
- Alarm detection and notification
- Regulatory, logic, and timing control
- Advanced mathematical computations
- Automatic detail displays.

CONTROL CAPABILITY

Micro-I/A stations, in conjunction with their host, provide for process management and control of continuous, batch and discrete control schemes.

Blocks can be configured by FoxCAE™ software for up-front project engineering, or by the Integrated Control Configurator for on-line maintenance.

Integrated Control software for Micro-I/A stations controls process variables using time-proven block algorithms, including the EXACT® algorithm and the EXACT multivariable (EXACT MV) family of algorithms. These algorithms are contained in the control blocks, which are configured by on-site process engineers to implement the desired control strategies.

The versatility of the algorithms, in conjunction with the variety of fieldbus modules available, allows you to readily implement control strategies ranging from simple feedback and cascade control to highly sophisticated feedforward, nonlinear, and complex characterization control.

Display and adjustment of control parameters are implemented through operator interfaces such as the AW51 and AW70 workstations.

Note that in the following table, the PLB, MDACT, DPIDA, and EVENT blocks must be paired with the appropriate equipment control block (ECB) and software type loaded into valid fieldbus module combinations.

For a description of the various block types, refer to *Integrated Control Software* (PSS 21S-3B1 B3).

SOFTWARE LICENSING

The software application for the control processor is called control station software. The control station software provides a wide variety of Foxboro preprogrammed and user programmable function block types, as listed in the table below.

A flexible method of software licensing allows you to choose from several function block capacities to match your application in both fault-tolerant and non-fault-tolerant versions most economically. Each function block type is assigned a functional point value in value points. For example, an AIN block for a single process variable is assigned one value point, while a MAIN block for up to eight process variables is assigned three value points. Many of the equipment control blocks that run the I/O modules are assigned a weight of zero value points, if they do not display values to process operators.

This licensing method allows you to use any of the available function block types. A message is displayed when your application approaches 90% of the licensed value points. When 100% of the licensed capacity is reached, you must purchase an upgrade to the next larger license to add additional function blocks to your database. A larger license can be added to any system without reconfiguring the existing control scheme.

NOTE

Resource constraints, for example, maximum database memory, maximum block per second throughput and maximum number of FBMs, may limit the application before reaching the licensed value point limit. This is particularly true for the largest license capacity.

Table 1. Set of Function Blocks with Value Points

Input/Output		**Control (Cont.)**	
AIN - Analog Input	1	DPIDA - Distributed Controller	3
AINR - Redundant Analog Input	1	DTIME - Dead Time Compensator	1
AOUT - Analog Output	1	FBTUNE - Feedback Self-Tuner	3
AOUTR - Redundant Analog Output	1	FFTUNE - Feedforward Self-Tuner	3
CIN - Contact Input	1	LIM - Limiter	1
COUT - Contact Output	1	LLAG - Lead/Lag	1
MAIN - Multiple Analog Input	3	LOGIC - Logic	1
MCIN - Multiple Contact Input	3	LONG - Long Integer Data Variable	1
MCOUT - Multiple Contact Output	3	MATH - Mathematics	1
Control		OUTSEL - Output Select	1
ACCUM - Accumulator	1	PACK - Packed Long Integer Variable	1
BIAS - Bias Computation	1	PATT - Pattern Match	1
BOOL - Boolean Data Variable	1	PID - Proportional, Integral, Derivative	3
CALC - Calculator	3	PIDA - Advanced PID	3
CALCA - Advanced Calculator	3	PIDE - PID w/ EXACT Tuning	3
CHARC - Characterizer	1	PIDX - PID Extended	3
DGAP - Differential Gap	1	PIDXE - PID Extended, w/ EXACT Tuning	3

Table 1. Set of Function Blocks with Value Points (Continued)

Control (Cont.)		**FXXX Communication Blocks**	
PTC - Proportional Time Control	3	FCIN - Contact Input	0
RAMP - Multi-Ramp Sequence	1	FCOUT - Contact Output	0
RATIO - Ratio Computation	1	FIIN - Integer Input	0
REAL - Real Data Variable	1	FIOUT - Integer Output	0
SIGSEL - Signal Selector	1	FMCIN - Multi-Contact Input	0
STATE - State	3	FMCOUT - Multi-Contact Output	0
STRING - String Data Variable	1	FRIN - Real Input	0
SWCH - Switch Position Selector	1	FROUT - Real Output	0
Sequence		FSIN - String Input	0
DEP - Dependent	3	FSOUT - String Output	
EXC - Exception	3	FTRIG - Trigger	
IND - Independent	3	**PLC™ Interface**	
MON - Monitor	1	PLCIO - Input-Output	3
TIM - Timer	1	PAKIN - Packed Input	3
Motor		PAKOUT - Packed Output	3
GDEV - General Device	1	BOUT - Binary Output	1
MDACT - Motor Driven Actuator	3	MROUT - Multiple Real Output	3
MTR - Motor Controller	1	RIN - Real Input	1
MOVLV - Motor-Operated Valve	1	MRIN - Multiple Real Input	3
VLV - Valve On/Off Controller	1	ROUT - Real Output	1
Optional		PLSOUT - Pulse Output	1
DSI - Panel Display Station Interface	1	BIN - Binary Input	1
AMSSEC - Gas Chromatograph	1	**Alarm**	
Window Equipment Control Blocks		ALMPRI - Alarm Priority Change	1
AMSPRI - Gas Chromatograph	1	BLNALM - Boolean Alarm	1
ECB13 - Hydrostatic Tank Gauge	3	MEALM - Measurement Alarm	1
ECB18 - Intelligent Transmitter	1	MSG - Message Alarm	1
ECB22 - Mass Flow Transmitter	1	PATALM - Pattern Alarm	1
Miscellaneous		REALM - Real Alarm	1
EVENT - Event Reporting	3	STALM - State Alarm	1
PLB - Programmable Logic Block	3		

NOTE

Additional equipment control blocks are available. They are assigned a value point rating of zero.

PERFORMANCE SPECIFICATIONS FOR Micro-I/A TYPE 1 STATION WITH 486 4 AND 8 MB PROCESSORS

Memory Allocation for Blocks
(typical block size is 650 bytes)
650 KB (up to V6.2)
1240 KB (V6.2 and greater) with 4 MB RAM;
2140 KB (V6.2 and greater) with 8 MB RAM

Blocks Instantiated (maximum)
Lower of Foxboro licensed limit or
1,000 (up to V6.2) or
2,000 (V6.2 and greater with 4 MB RAM) or
4,000 (V6.2 and greater with 8 MB RAM)

Number of FBMs Supported
64 (excluding expansion modules)

Minimum Block Processing Cycle (BPC)
100 ms

Configurable Block Periods
0.1, 0.2, 0.5, 0.6, 1, 2, 5, 6, 10, 30 seconds
1, 10, 60 minutes

Basic Processing Cycle
0.1, 0.2, 0.5, 1.0, or 2.0 seconds, selectable at system configuration time

IPC Connections
51

Object Manager (OM) Lists (maximum)
60

Block Executions Per Second
1100 blocks/second, typical (486SL-25 MHz)
3100 blocks/second, typical (486DX4-75 MHz)

Memory Allocation for OM Scanner Points
560 KB with 4 MB RAM
910 KB with 8 MB RAM

Maximum OM Scanner Database
12,000 points

Sequence Block Size
32 KB maximum for each block

Interface Cards (maximum)
I/A Series Fieldbus Interface – 1
GE™ Fanuc™ Direct Connect I/O Interface – 3
Allen-Bradley™ Remote I/O Interface – 3
PROFIBUS-DP™ Interface – 3
Modbus™ Interface – 2
Allen-Bradley PLC5™ Ethernet Interface – 1

Concurrent Mixing of Interface Cards
Mixtures of I/A Series Fieldbus Interface, GE Fanuc Direct Connect I/O Interface, Allen-Bradley Remote I/O Interface, PROFIBUS-DP Interface, Modbus Interface and Allen-Bradley PLC5 Ethernet Interface

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