

Automation Implementation Description

AS-0.2230 Automaatio- ja systeemitekniikan laboriotyöt
Työ 14

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1 Version history

24.8.2009	Created this document, added up to date pictures of all the control programs and SCADA screens	AK
28.8.2009	Added the sequence control implementation	AK

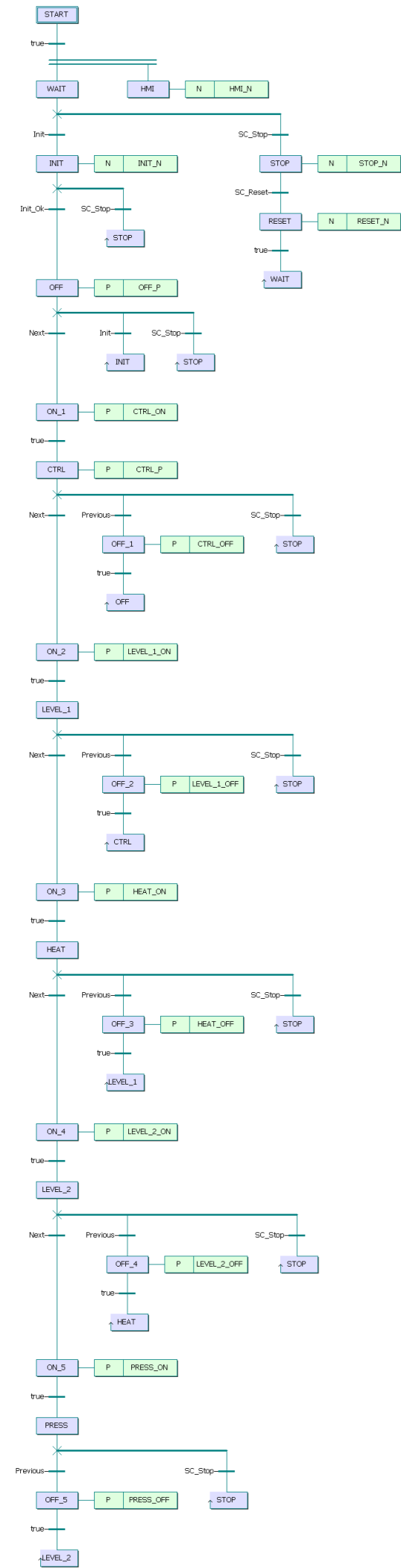
2 About this document

This document illustrates the control circuits and SCADA screens which implement the automation requirements defined in the Automation Requirements – document. This is not a full documentation of the programs, as it is designed to be used mainly for reference and overview purposes.

3 Program implementations

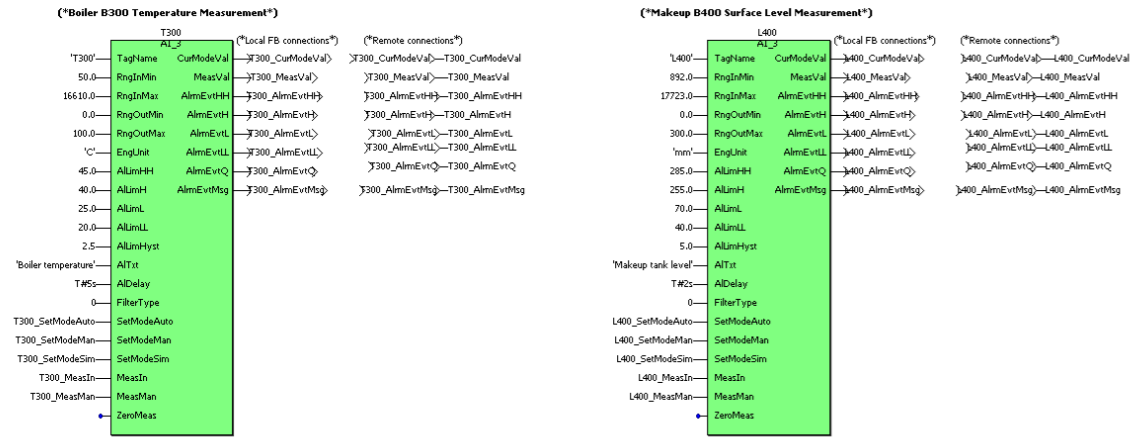
3.1 Sequence program

Program: SEQUENCE
Date: 24.8.2009



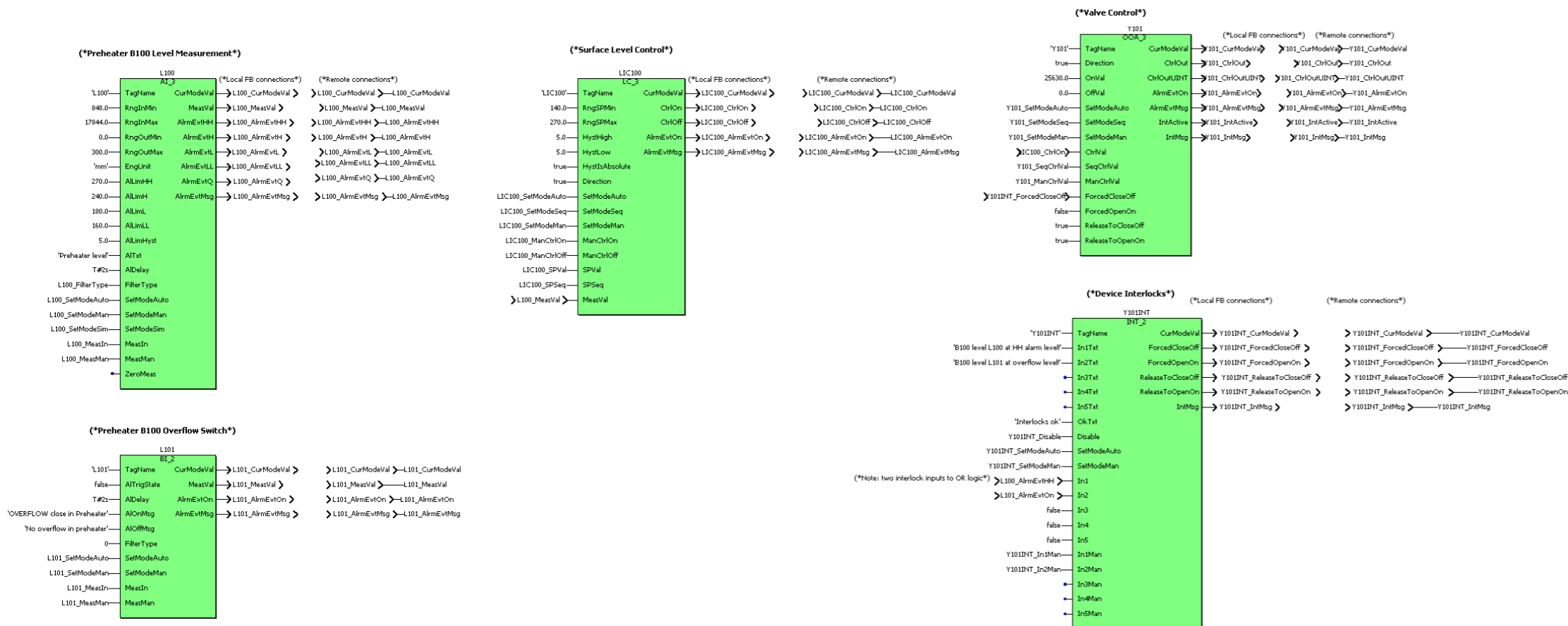
3.2 Generic measurement program

Program: GENMEASPROG
Date: 24.8.2009



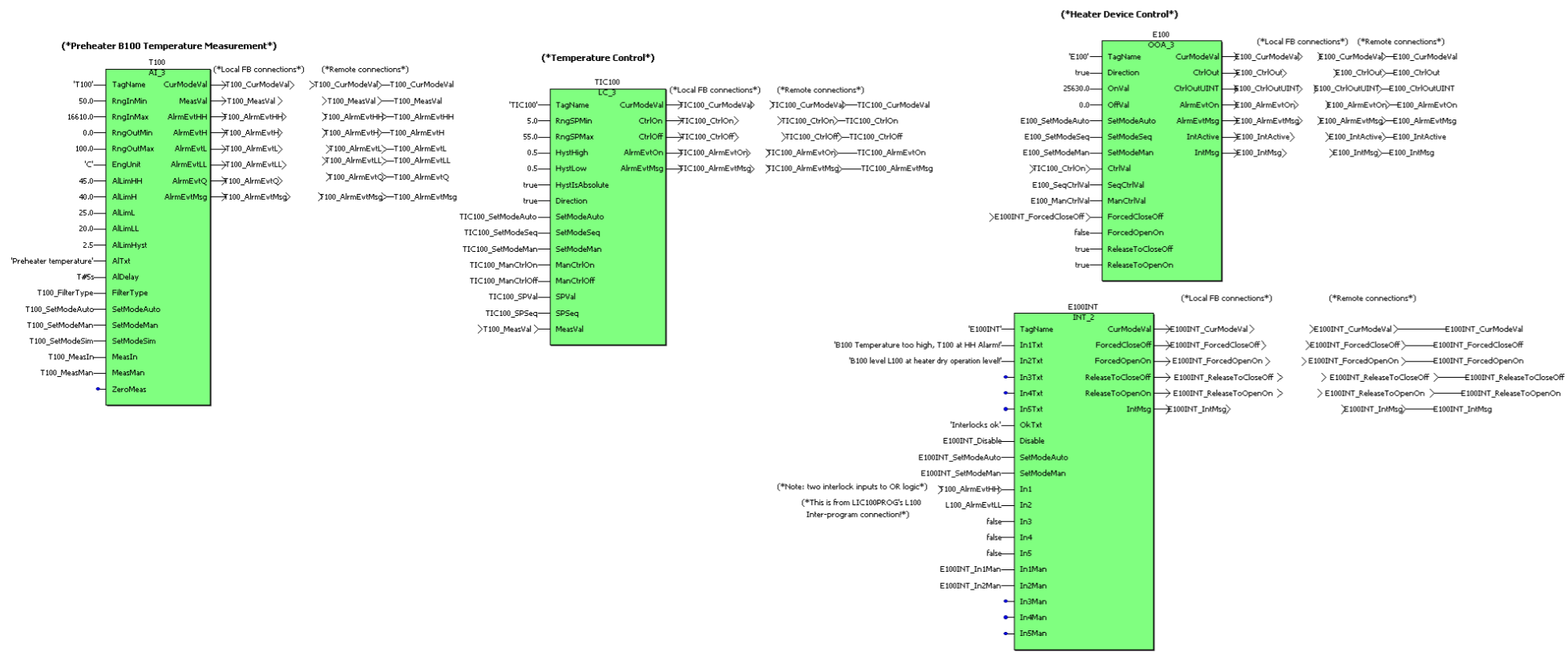
3.3 LIC100 program

Program: LIC100PROG
Date: 24.8.2009



3.4 TIC100 program

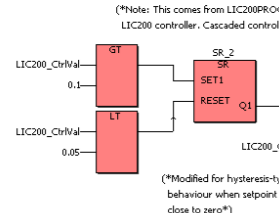
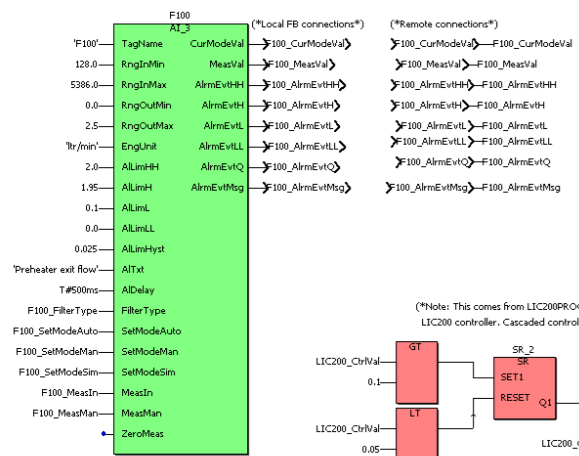
Program: TIC100PROG
Date: 24.8.2009



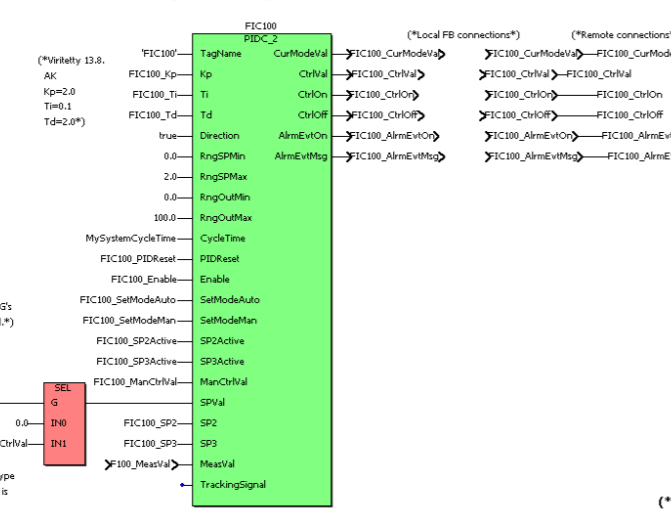
3.5 FIC100 program

Program: FIC100PROG
Date: 24.8.2009

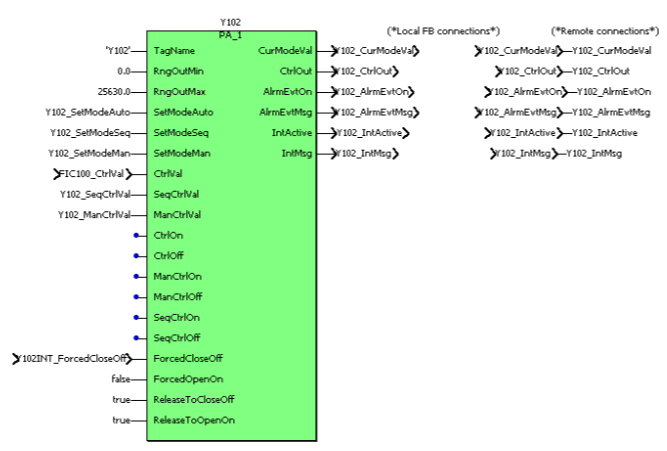
(*Preheater B100 Exit Flow Measurement*)



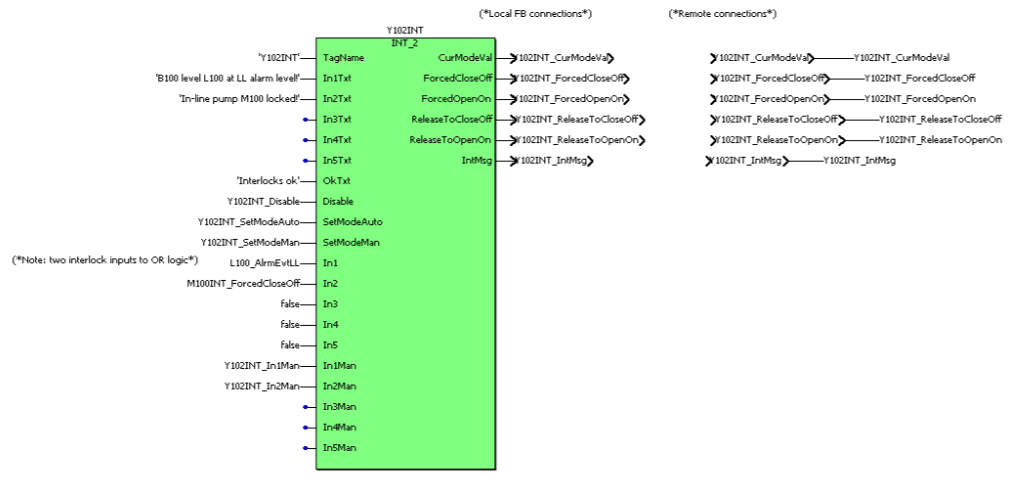
(*Flow Control*)



(*Valve Control*)



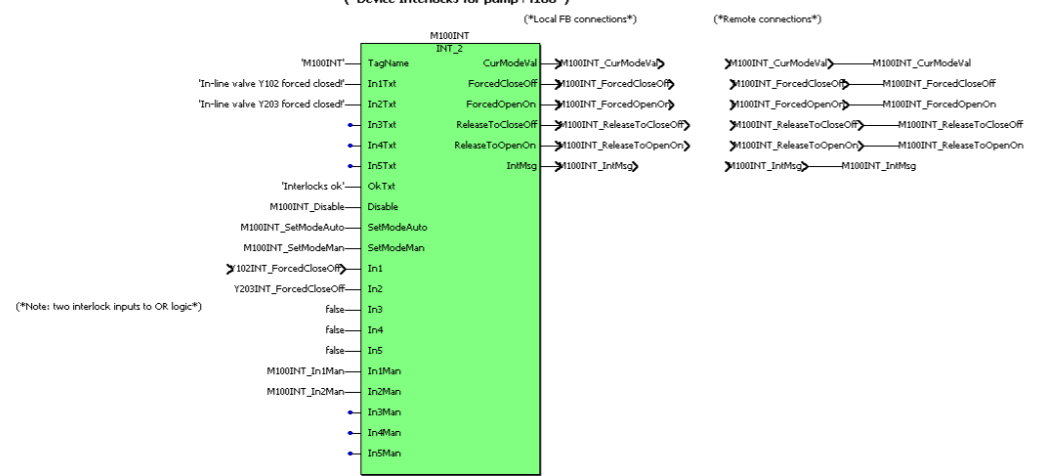
(*Device Interlocks for control valve Y102*)



(*Pump Control*)

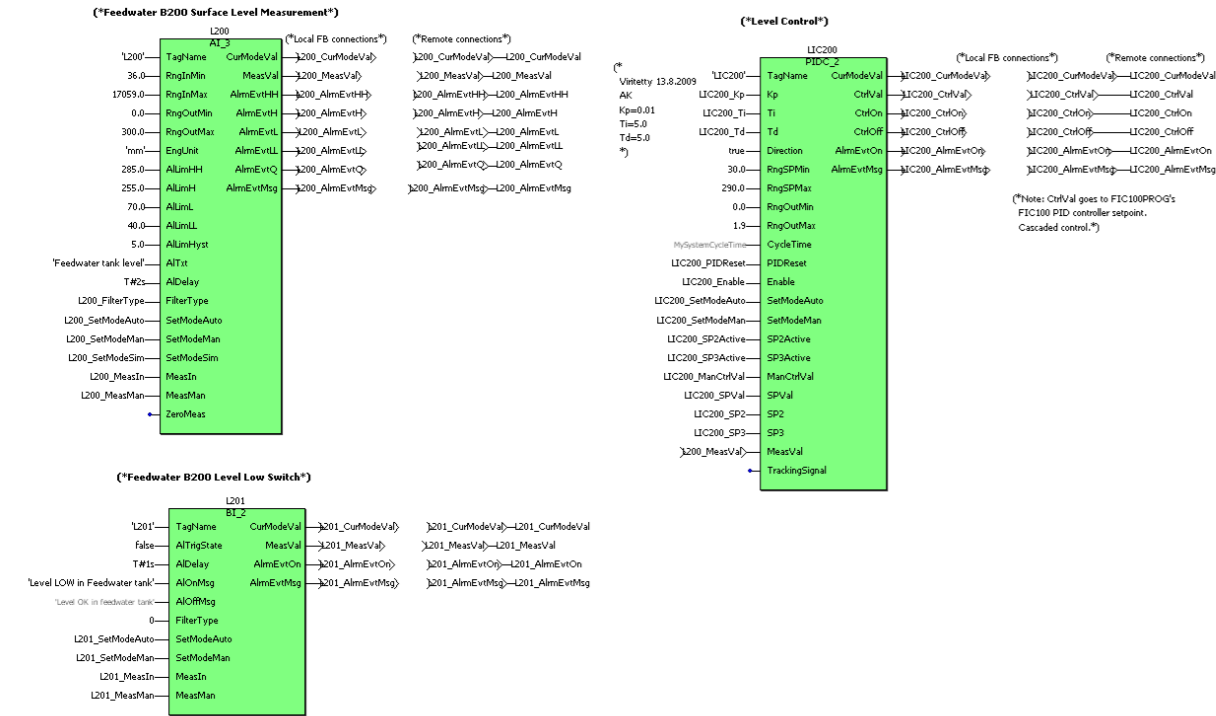


(*Device Interlocks for pump M100*)



3.6 LIC200 program

Program: LIC200PROG
Date: 24.8.2009



3.7 PIC300 program

Program: PIC300PROG
Date: 24.8.2009



3.8 Generic actuator program

Program: GENACTPROG
Date: 24.8.2009

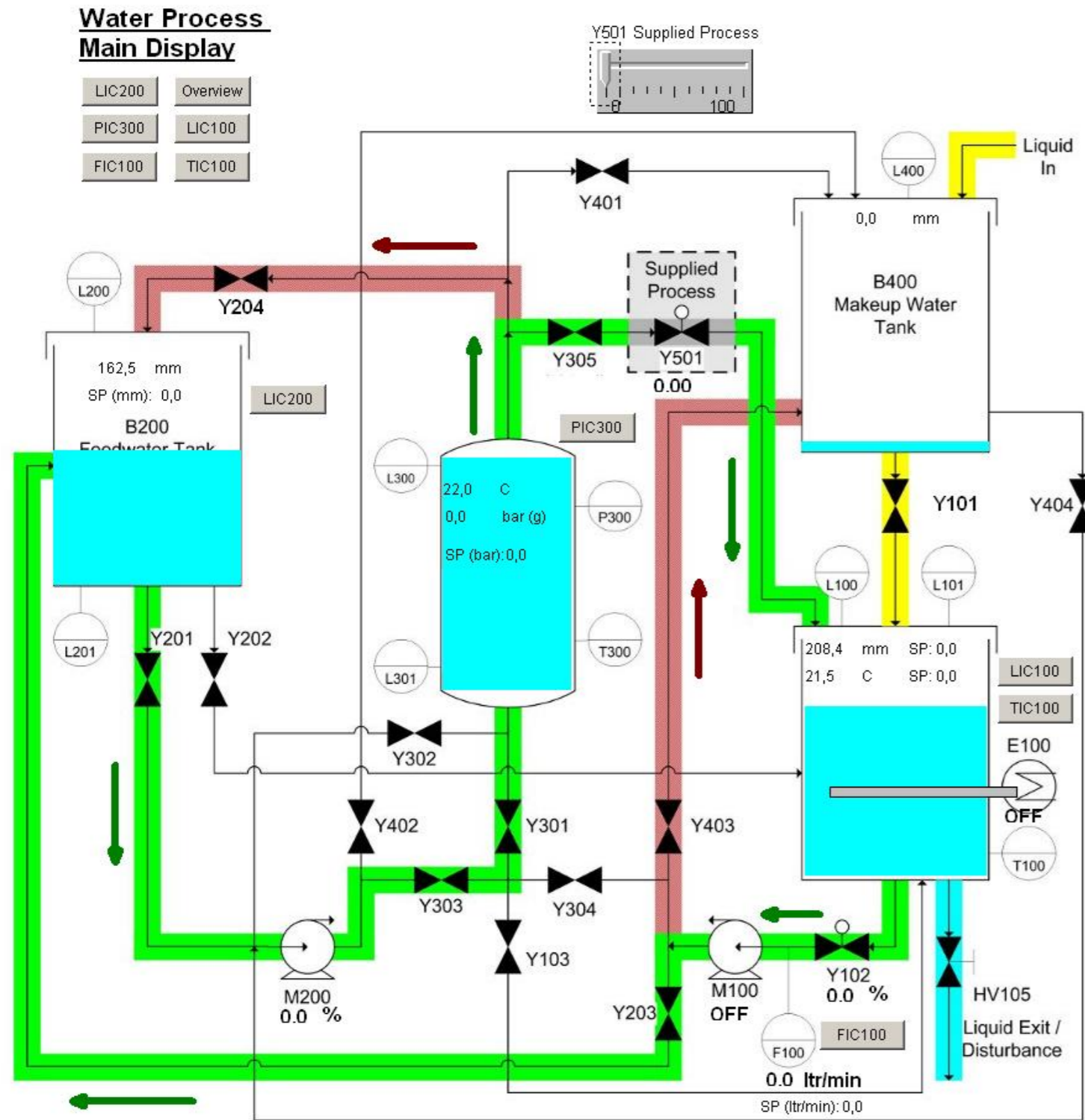


4 SCADA screens

4.1 Main screen

Screen: Main

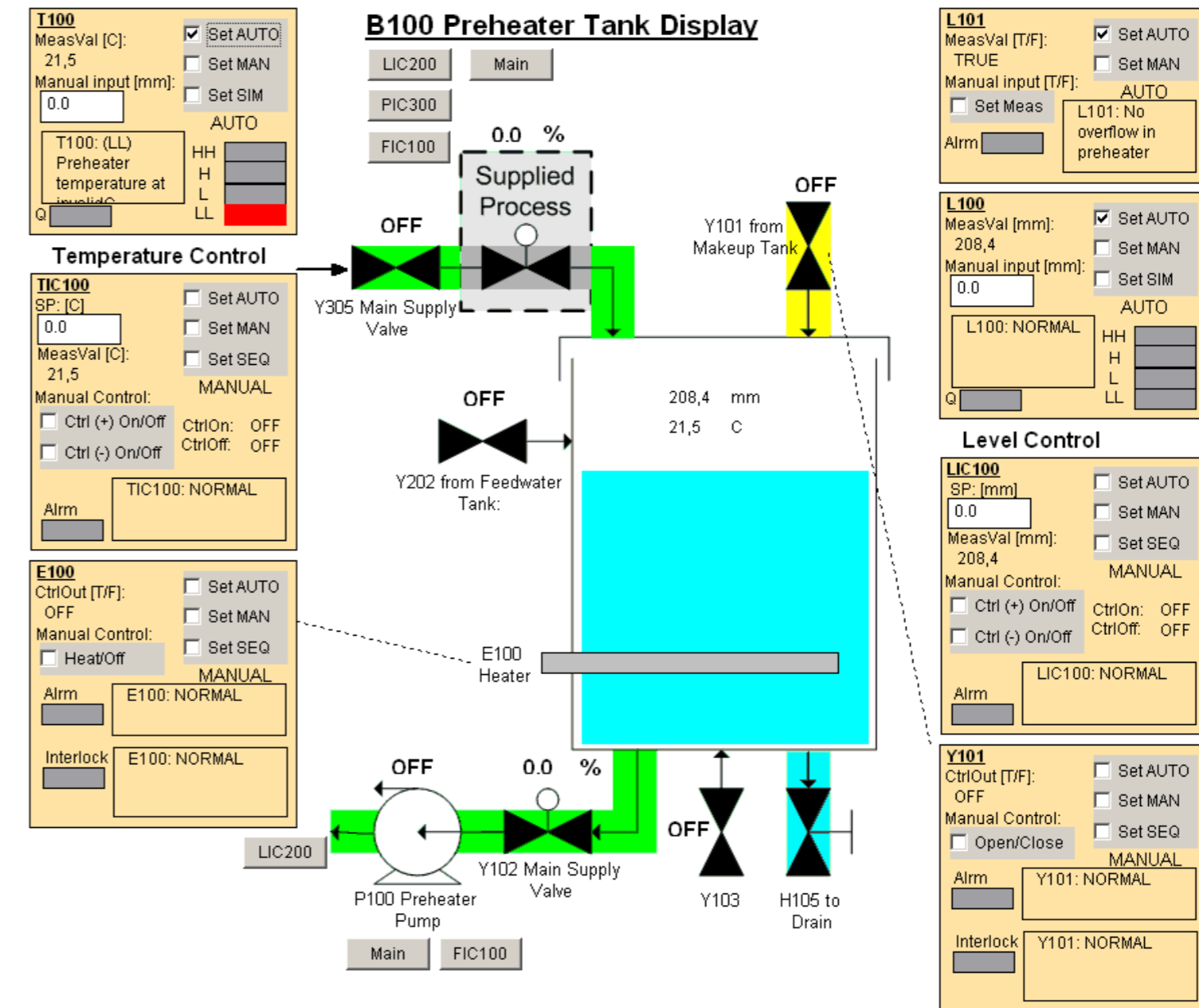
Date: 24.8.2009



4.2 Preheater tank screen

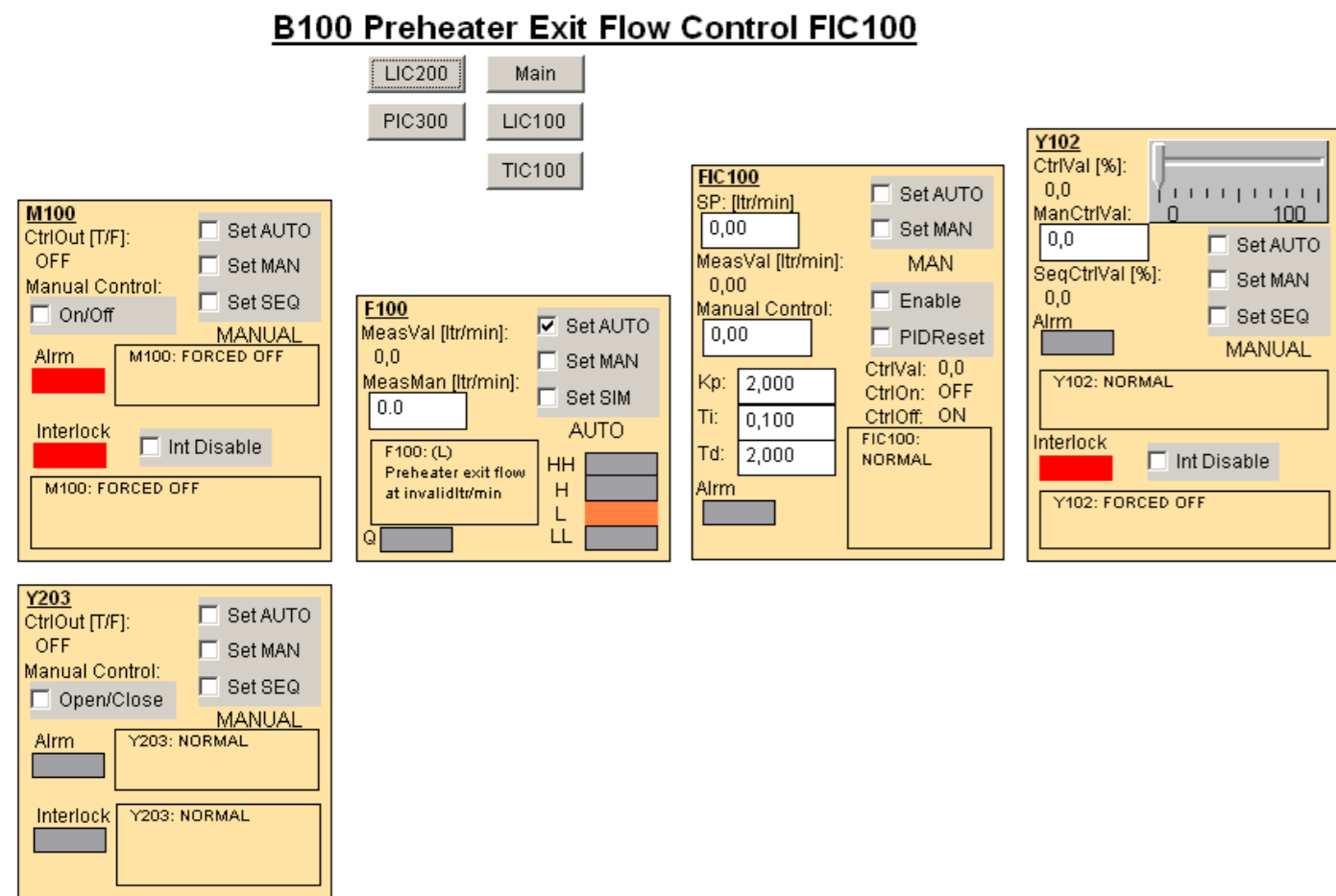
Screen: Preheater

Date: 24.8.2009



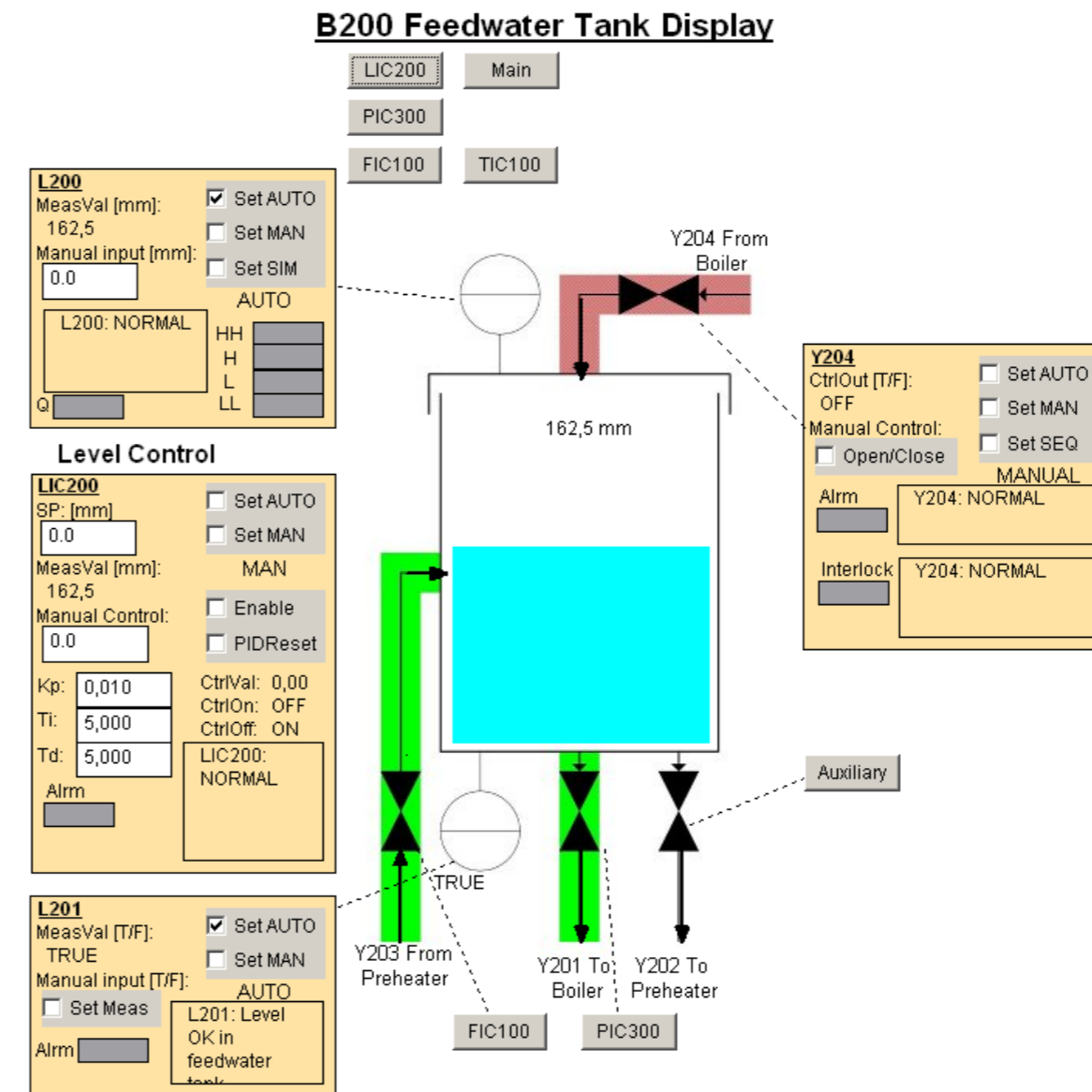
4.3 FIC100 screen

Screen: FIC100
Date: 24.8.2009



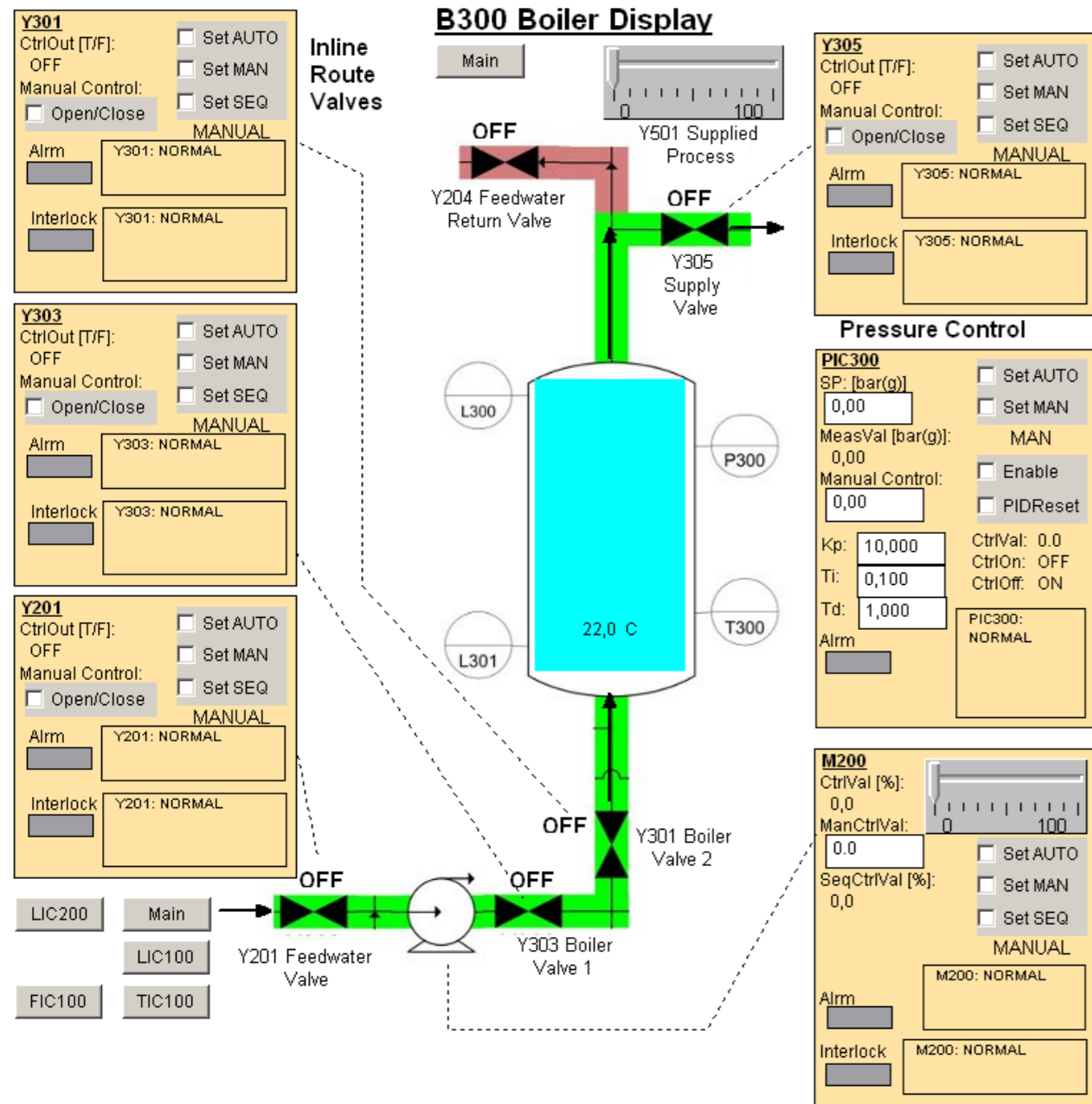
4.4 Feedwater tank screen

Screen: Feedwater
Date: 24.8.2009



4.5 Boiler tank screen

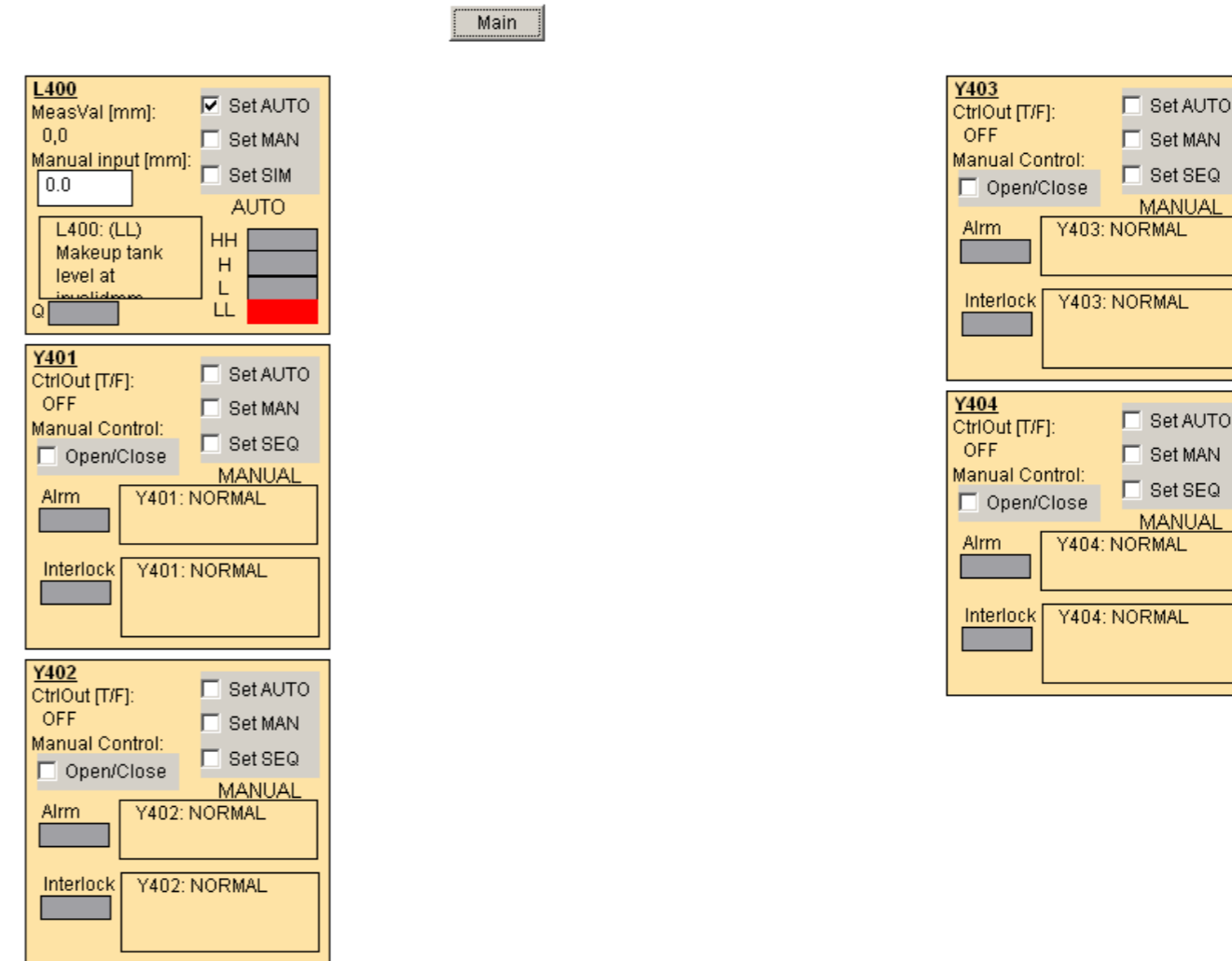
Screen: Boiler
Date: 24.8.2009



4.6 Makeup water tank screen

Screen: Makeup
Date: 24.8.2009

B400 Makeup Tank Display



4.7 Auxiliary equipment screen

Screen: AuxiliaryEq

Date: 24.8.2009

B100 Auxiliary Equipment

Main

Y103 CtrlOut [T/F]: <input type="checkbox"/> Set AUTO OFF <input type="checkbox"/> Set MAN Manual Control: <input type="checkbox"/> Set SEQ <input type="checkbox"/> Open/Close MANUAL Alarm Y103: NORMAL Interlock Y103: NORMAL	Y202 CtrlOut [T/F]: <input type="checkbox"/> Set AUTO OFF <input type="checkbox"/> Set MAN Manual Control: <input type="checkbox"/> Set SEQ <input type="checkbox"/> Open/Close MANUAL Alarm Y202: NORMAL Interlock Y202: NORMAL	Y302 CtrlOut [T/F]: <input type="checkbox"/> Set AUTO OFF <input type="checkbox"/> Set MAN Manual Control: <input type="checkbox"/> Set SEQ <input type="checkbox"/> Open/Close MANUAL Alarm Y302: NORMAL Interlock Y302: NORMAL
Y304 CtrlOut [T/F]: <input type="checkbox"/> Set AUTO OFF <input type="checkbox"/> Set MAN Manual Control: <input type="checkbox"/> Set SEQ <input type="checkbox"/> Open/Close MANUAL Alarm Y304: NORMAL Interlock Y304: NORMAL		

4.8 Process overview screen

Screen: Overview

Date: 24.8.2009

Process Overview

Main

STOP

Preheater tank initial level: 160,0 mm

Feedwater tank initial level: 70,0 mm

RESET

INITIALIZE

PREVIOUS

Initialize controllers

- Preheater level control LIC100
- Heater control TIC100
- Feedwater level control LIC200 and FIC100
- Pressure control PIC100

NEXT

P300

PIC300

Setpoint 0,00 bar Kp 10,000

Y501 Control Value 00

Ti 0,100

Td 1,000

L200

LIC200

Setpoint 0,0 mm Kp 0,010

Ti 5,000

Td 5,000

F100

FIC100

Setpoint 0,00 l/min Kp 2,000

Ti 0,100

Td 2,000

L100

LIC100

Setpoint 0,0 mm

160 .. 250

T100

TIC100

Setpoint 0,0 C

20 .. 50

L400

T300