

Fluke 884X Magic

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Author: pigrew

Outguard Firmware

The outguard FPGA bitstream is in U66. It is a STMicro M25P40. It probably can be programmed through JTAG using the J13 connector, though it's unclear which pins to use. My guess is that this was programmed out-of-circuit due to a paint mark/sticker installed on the package.

The uclinux filesystem is stored in U77.

Inguard Firmware

Inguard firmware is also stored in a STMicro M25P40 (U69). The bitstream is "u69_nios.flash".

User Measurement port (3490, configurable port)

wizard elfbreath	Enable magic commands
cco [CALNAME],value	Set calibration value
ccorecord	Write calibration to flash
cccos?	Read calibration coefficients
ig_download "/usr/bin/u69_nios.flash"	Write file to inguard flash (should be Motorola ROM format containing Altera FPGA bitstream)
sernum?	Query serial number
syst:rem	Got to remote (lock display)
version?	Request HW/SW versions
DISP:TEXT "Hello World"	

Telnet Port (23)

User: root

Password: spider

FTP

User: root

Password: uClinux

Calibration Constants

Constant Name	Value	Description
DC100MV_G	-2.10591033E-02	u
DC100MV_N	-2.10652649E-02	
DC100MV_Z	-3.00000000E+00	

DC100MV_R_Z	1.30000000E+01	
DC1V_G	-2.04340816E-02	
DC1V_N	-2.04321966E-02	
DC1V_Z	0.00000000E+00	
DC1V_R_Z	1.00000000E+00	
DC10V_G	-2.05846746E-02	
DC10V_N	-2.05833036E-02	
DC10V_Z	0.00000000E+00	
DC100V_G	-2.06787065E-02	
DC100V_N	-2.06728838E-02	
DC100V_Z	0.00000000E+00	
DC1000V_G	-2.08312776E-02	
DC1000V_N	-2.08290517E-02	
DC1000V_Z	0.00000000E+00	
DC100MV_DF50	2.81000000E+02	
DC100MV_DF60	2.81000000E+02	
DC100MV_DF50_1PLC	2.81000004E+01	
DC100MV_DF60_1PLC	2.81000004E+01	
DC10V_REF_Z	0.00000000E+00	
DC1V_REF_Z	0.00000000E+00	
DC100MV_REF_Z	0.00000000E+00	
DC1V_REF_R_Z	0.00000000E+00	
DC100MV_REF_R_Z	0.00000000E+00	
DC100UA_G	-3.04470658E-02	
DC100UA_N	-3.04650273E-02	
DC100UA_Z	1.79350000E+03	
DC1MA_G	-3.06956060E-02	
DC1MA_N	-3.06981243E-02	
DC1MA_Z	1.78500000E+02	
DC10MA_G	-1.77682098E-02	
DC10MA_N	-1.77769959E-02	
DC10MA_Z	1.74450000E+03	
DC100MA_G	-1.80484317E-02	
DC100MA_N	-1.80558357E-02	
DC100MA_Z	1.78000000E+02	
DC400MA_G	-1.74214877E-02	
DC400MA_N	-1.74208209E-02	
DC400MA_Z	1.77999992E+01	
DC1A_G	-2.57633291E-02	
DC1A_N	-2.57694293E-02	
DC1A_Z	1.29900000E+03	
DC10A_G	-2.61284392E-02	
DC10A_N	-2.61783991E-02	

DC10A_Z	1.34500000E+02	
R10OHM_G	0.00000000E+00	
R10OHM_Z	0.00000000E+00	
R10OHM_R_Z	0.00000000E+00	
R100OHM_G	-5.87117579E-03	
R100OHM_Z	1.80000000E+02	
R100OHM_R_Z	1.39500000E+02	
R1KOHM_G	-5.23026753E-03	
R1KOHM_Z	1.70000000E+01	
R1KOHM_R_Z	1.25000000E+01	
R10KOHM_G	-8.83253384E-03	
R10KOHM_Z	1.70000000E+01	
R10KOHM_R_Z	1.30000000E+01	
R100KOHM_G	-8.49675760E-03	
R100KOHM_Z	1.70000000E+01	
R100KOHM_R_Z	1.25000000E+01	
R1MOHM_G	-8.63952842E-03	
R1MOHM_Z	1.00000000E+00	
R10MOHM_G	-6.20183675E-03	
R10MOHM_Z	1.00000000E+00	
R100MOHM_G	-1.91225519E-03	
R100MOHM_O	3.67030000E+04	
R1GOHM_G	0.00000000E+00	
R1GOHM_O	0.00000000E+00	
AC100MV_GS	-3.86919715E-02	
AC100MV_GF	-3.84965129E-02	
AC100MV_OS	0.00000000E+00	
AC100MV_OF	0.00000000E+00	
AC100MV_LF	5.52846827E-02	
AC100MV_P	-3.00000000E+00	
AC1V_GS	-4.59646657E-02	
AC1V_GF	-4.57730070E-02	
AC1V_OS	0.00000000E+00	
AC1V_OF	0.00000000E+00	
AC1V_LF	5.52846827E-02	
AC1V_P	1.00000000E+00	
AC10V_GS	-3.50827165E-02	
AC10V_GF	-3.48902419E-02	
AC10V_OS	0.00000000E+00	
AC10V_OF	0.00000000E+00	
AC10V_LF	5.52846827E-02	
AC10V_P	-3.00000000E+00	
AC100V_GS	-2.57352814E-02	

AC100V_GF	-2.55291928E-02	
AC100V_OS	0.00000000E+00	
AC100V_OF	0.00000000E+00	
AC100V_LF	5.52846827E-02	
AC100V_P	-4.00000000E+00	
AC1000V_GS	-2.33191941E-02	
AC1000V_GF	-2.31136512E-02	
AC1000V_OS	0.00000000E+00	
AC1000V_OF	0.00000000E+00	
AC1000V_LF	5.52846827E-02	
AC1000V_P	-1.00000000E+00	
AC100UA_GS	0.00000000E+00	
AC100UA_GF	0.00000000E+00	
AC100UA_OS	0.00000000E+00	
AC100UA_OF	0.00000000E+00	
AC100UA_LF	5.52846827E-02	
AC1MA_GS	0.00000000E+00	
AC1MA_GF	0.00000000E+00	
AC1MA_OS	0.00000000E+00	
AC1MA_OF	0.00000000E+00	
AC1MA_LF	5.52846827E-02	
AC10MA_GS	8.42787884E-03	
AC10MA_GF	8.64203088E-03	
AC10MA_OS	0.00000000E+00	
AC10MA_OF	0.00000000E+00	
AC10MA_LF	5.52846827E-02	
AC100MA_GS	8.50246812E-04	
AC100MA_GF	1.06136897E-03	
AC100MA_OS	0.00000000E+00	
AC100MA_OF	0.00000000E+00	
AC100MA_LF	5.52846827E-02	
AC400MA_GS	1.73295580E-03	
AC400MA_GF	1.94284169E-03	
AC400MA_OS	0.00000000E+00	
AC400MA_OF	0.00000000E+00	
AC400MA_LF	5.52846827E-02	
AC1A_GS	1.11490932E-04	
AC1A_GF	2.41402464E-04	
AC1A_OS	0.00000000E+00	
AC1A_OF	0.00000000E+00	
AC1A_LF	5.52846827E-02	
AC10A_GS	-7.64098810E-03	
AC10A_GF	-7.37048127E-03	

AC10A_OS	0.00000000E+00	
AC10A_OF	0.00000000E+00	
AC10A_LF	5.52846827E-02	
ACLIN_A0	5.86465683E+01	
ACLIN_A1	6.26325607E-04	
ACLIN_A2	-1.35006772E-09	
ACLIN_A3	4.18771183E-16	
C_PULSE_G	0.00000000E+00	
C_O	0.00000000E+00	
SPARE0	0.00000000E+00	
SPARE1	0.00000000E+00	

Filesystem

/proc/mtd

```
# cat /proc/mtd
dev:      size   erasesize  name
mtd0: 00080000 00010000 "Configuration flash"
mtd1: 004e0000 00020000 "romfs/JFFS2"
mtd2: 00300000 00020000 "loader/kernel"
mtd3: 00800000 00020000 "Dnld buffer space (JFFS2)"
mtd4: 00020000 00020000 "romfs/Protected"
#
```

```
# /usr/bin/md5sum /usr/bin/u69_nios.flash
4a01562a74f5af26d488bee8fcbeceba /usr/bin/u69_nios.flash
```