VAISALA

Install IRIS/RDA 10.1.3 patch release

Revision history

Revision	Date/Name	Description of change	Approver
A	2025-01-17 Sami Koskelo	Installation instructions for 10.1.3 patch release	Approver
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1 Install IRIS/RDA v10.1.3 patch

This document has instructions to install the IRIS/RDA v10.1.3 patch on system that is already running IRIS/RDA v10.1.0. In case of full installation, normal IRIS/RDA installation instructions can be used.

1.1 Patch content and files needed

This patch has updates to RVP9, RVP10 and RCP8. These updates also require installing new common packages and for RVP10 installations new IFDR10 firmware. Due to package dependencies, all vaisala-wr packages must be updated to 10.1.3 even most of them doesn't have any changes.

Download installation iso-file: **vaisala-iris-rda-10.1.3-el9.iso**

1.1.1 Installation to the RVP9 and RVP10 systems

Login to the server using admin account. Copy the iso-file to the server or insert the USB-drive having the patch files.

1) Login as admin
2) Stop all IRIS/RDA processes: `sudo qiris; sudo qant`
3) Check that no IRIS/RDA processes are running: `ps_iris`
4) Insert the USB memory. (Or mount the iso image file to desired path.
5) Run command: `cd /run/media/admin/VAISALA-IRIS-RDA-INSTALL/vaisala-iris-rda/Packages/`
   (If the iso-image as mounted to other path, adjust the command accordingly)
6) Run command: `sudo dnf update "vaisala-wr*" ./* --disablerepo="*"`
7) Run command: `sudo dnf remove kmod-rda-5.14.0-427.el9_4-10.1.0-1.el9.1.x86_64`
8) Run command: `sudo akmods`

   Note! Next steps are needed only in RVP10 systems:

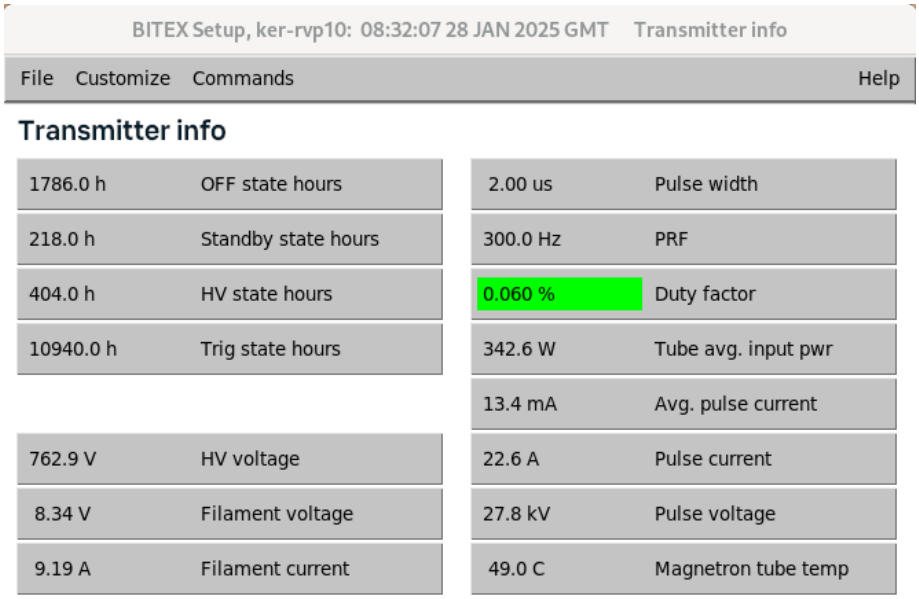
9) Reboot IFDR10, run command: `ifdr_reboot`
10) Wait until IFDR10 has rebooted. Check status with command: `ifdr_status`
11) Flash new IFDR10 firmware, run command: `rdaflash -ifdr10`

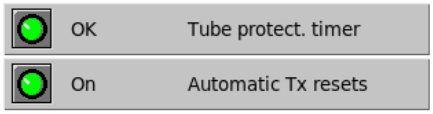
1.1.2 Update BITEX for Scandinova transmitter

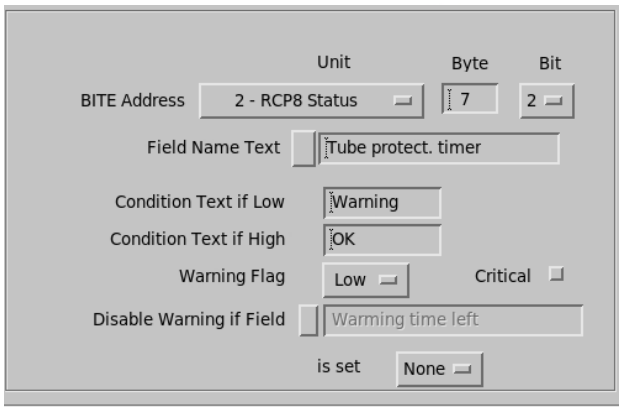
Open Bitex in setup mode: `bitex -setup &`

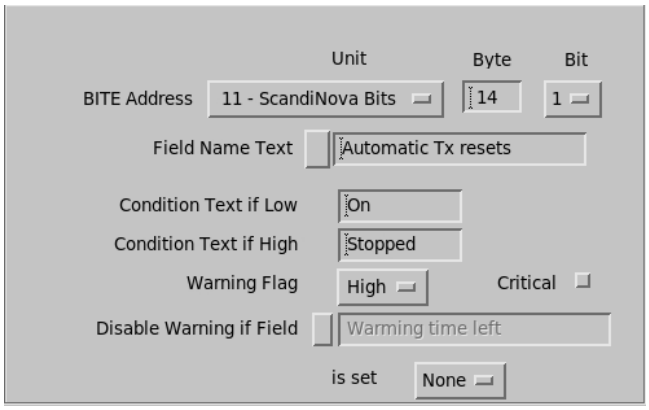
Change the configuration:

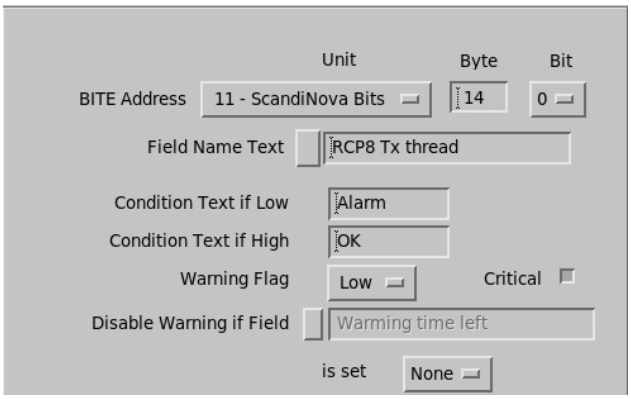
- Scandinova BITE packet byte count is now **15**
- On the transmitter info screen, pulse width has an additional decimal of precision, so cal slope should be set to **0.01**
- Add 4 new status fields to the Transmitter Info window. Configurations shown in pictures below.

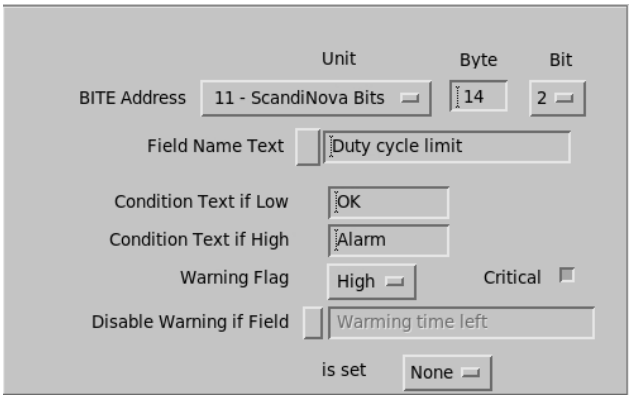












1.1.3 RCP8 configuration

In the RCP8 antx menu do the following changes:

Open antx, run command : `antx`

In antx open control logic menun command : `co lo`

1.1.3.1 Changes to control logic when using Scandinova M060 transmitter:

Old control logic line	New control logic line
# Disable radiate if canbus fails v6 = !s80	*# Disable radiate if canbus fails or polarization switched* v6 = !(s80 | t6_change_2)
# Disable radiate if no fans or only one fan is running v14 = (s26 & s27) | (s26 & s28) | (s27 & s28)	*# Disable radiate when polarization is changed* t6_change_2 = cPolHoriz
# Allow v14 to be shown in Bitex s29 = v14	[deleted]
v15 = v12 & v14	[deleted]
# Disable radiate if something critical fails cRadiate = cRadiate & v5 & v6 & v15	*# Disable radiate if something critical fails* cRadiate = cRadiate & v5 & v6 & v12
# Extend 1 hour timer if radiate is ON and PRF > 0. t8_extend_3600 = (cRadiate & s134) | (t10_single_1)	*# Transmitter reset or RCP8 reset pressed* v7 = c0 | cReset *# Extend 1 hour timer if radiate is ON and PRF > 0 or reset was pressed* t8_extend_3600 = (sRadiate & s134) | (t10_single_1 | v7) *# Allow t8 to be shown in Bitex* s30 = t8_extend_3600

1.1.3.2 Changes to control logic when using Scandinova M050 transmitter:

Old control logic line	New control logic line
# Disable radiate if canbus fails v6 = !s80	*# Disable radiate if canbus fails or polarization switched* v6 = !(s80 | t6_change_2)
# Extend 1 hour timer if radiate is ON and PRF > 0. t8_extend_3600 = (cRadiate & s134) | (t10_single_1)	*# Transmitter reset or RCP8 reset pressed* v7 = c0 | cReset *# Extend 1 hour timer if radiate is ON and PRF > 0 or reset* was pressed t8_extend_3600 = (sRadiate & s134) | (t10_single_1 | v7) *# Allow t8 to be shown in Bitex* s30 = t8_extend_3600 *# Disable radiate when polarization is changed* t6_change_2 = cPolHoriz

1.1.3.3 Scandinova configurations

If the RCP8 reports the Scandinova startup check fails, the mismatching lines can be fixed according to the listings below, or commented out in file `/etc/vaisala/irisrda/scandinova_modulator.conf`

File should be looking like this for M050:

```
v1.0 M050 # File format version and modulator model

# Startup checks for Scandinova magnetron modulator

# Check format: <REGISTER_ADDRESS>[_OPTIONAL_COMMENT] <REGISTER_TYPE> <CHECK_TYPE> <OPERAND_A> <OPERAND_B> # <COMMENT>
# <REGISTER_ADDRESS>: Modbus register address. Can be followed by an optional comment, e.g. 4000_my_register
# <REGISTER_TYPE>: uint16, uint32, float (charN not supported)
# <CHECK_TYPE>: equals or range
# <OPERAND_A>: equals check: expected value, range check: minimum value
# <OPERAND_B>: equals check: optional delta value for comparison (default 0 for integers, 1e-6 for floats), range check: maximum value
# <COMMENT>: Anything after a "#" is a comment and empty lines are ignored

5126_MB_FIL_SET                  float   equals  9.50
5128_MB_FIL_SET_2                float   equals  0.00
5130_MB_FIL_RAMP_SPEED           float   equals  0.20     # Unit V or A / sec
5132_MB_HV_SET                   float   range   700.00   850.00   # Unit V
5134_MB_HV_RAMP_SPEED            float   equals  400.00   # Unit V/sec
5189_MB_ENABLE_STANDBY_INTERLOCK uint32  equals  39
5191_MB_ENABLE_HV_INTERLOCK      uint32  equals  0
5193_MB_ENABLE_TRIG_INTERLOCK    uint32  equals  46
```

5195_MB_COM_TIMEOUT_SET	uint16	equals	1500	# Unit ms	
5196_MB_PEAK_POWER	float	range	450.00	700.00	# Unit kW
5198_MB_BLOCK_TIME_1	uint16	equals	300		# Unit sec
5199_MB_BLOCK_TIME_2	uint16	equals	0		# Unit sec
5200_MB_CONFIG_WORD	uint32	equals	2076		
5202_MB_PULSE_WIDTH_SET_H_LIM	float	equals	3.50		# Unit us
5204_MB_PULSE_WIDTH_SET_L_LIM	float	equals	0.00		# Unit us
5206_MB_HV_SET_H_LIM	float	equals	800.00		# Unit V
5208_MB_HV_SET_L_LIM	float	equals	0.00		# Unit V
5210_MB_FIL_SET_H_LIM	float	equals	10.00		# Unit V or A
5212_MB_FIL_SET_L_LIM	float	equals	0.00		# Unit V or A
5214_MB_PRF_SET_H_LIM	float	equals	2450.00		# Unit Hz
5216_MB_PRF_SET_L_LIM	float	equals	0.00		# Unit Hz
5218_MB_HV_VOLT_READ_H_LIM	float	equals	0.00		# Unit V (Not implemented in M050)
5220_MB_CT_CVD_READ_DELAY	float	equals	150.00		# Unit 10 ns
5222_MB_IGBT_DELAY	uint16	equals	0		# Unit 10 ns
5224_MB_FIL_VOLT_READ_WINDOW	float	equals	5.00		# Unit %
5228_MB_FIL_CURR_READ_WINDOW	float	equals	5.00		# Unit %
5230_MB_PRF_READ_H_LIM	float	equals	2450.00		# Unit Hz
5232_MB_PRF_READ_L_LIM	float	equals	0.00		# Unit Hz
5234_MB_FIL_WARNING_VOLT_READ_H_LIM	float	equals	10.00		# Unit V
5236_MB_FIL_WARNING_VOLT_READ_L_LIM	float	equals	5.00		# Unit V
5238_MB_FIL_WARNING_CURR_READ_H_LIM	float	equals	14.00		# Unit A
5240_MB_FIL_WARNING_CURR_READ_L_LIM	float	equals	5.00		# Unit A
5242_MB_MAX_ARC_CONSECUTIVE	uint16	equals	10		
5243_MB_MAX_ARC_SHORT_WINDOW	uint16	equals	25		# Arcs during one second
5244_MB_MAX_ARC_LONG_WINDOW	uint16	equals	100		# Arcs during one hour
5245_MB_ARC_RECOVERY_START	uint16	equals	10		# Unit 10 ns
5246_MB_ARC_RECOVERY_INC	uint16	equals	1		# Unit 10 ns
5247_MB_A_INPUT_DELAY	uint16	equals	0		# Unit 10 ns
5248_MB_B_INPUT_DELAY	uint16	equals	0		# Unit 10 ns
5249_MB_C_INPUT_DELAY	uint16	equals	0		# Unit 10 ns
5250_MB_SW_INPUT_DELAY	uint16	equals	0		# Unit 10 ns
5251_MB_TRIG_INPUT_MAX_WIDTH	uint16	equals	1100		# Unit 10 ns
5252_MB_MAX_AVERAGE_POWER	float	equals	0.92		# Unit kW

A check for set calibration values starting from address 5333 (note: read calibration values have the order of uint16 and float swapped)

5333_MB_FIL_RUNBACK_TABLE_X0	float	equals	0.0		
5335_MB_FIL_RUNBACK_TABLE_Y0	uint16	equals	100		
5336_MB_FIL_RUNBACK_TABLE_X1	float	equals	200.0		
5338_MB_FIL_RUNBACK_TABLE_Y1	uint16	equals	93		
5339_MB_FIL_RUNBACK_TABLE_X2	float	equals	400.0		
5341_MB_FIL_RUNBACK_TABLE_Y2	uint16	equals	86		
5342_MB_FIL_RUNBACK_TABLE_X3	float	equals	600.0		
5344_MB_FIL_RUNBACK_TABLE_Y3	uint16	equals	79		
5345_MB_FIL_RUNBACK_TABLE_X4	float	equals	800.0		
5347_MB_FIL_RUNBACK_TABLE_Y4	uint16	equals	72		

5459_MB_CCPS_INT_LEV_HV	uint16	equals	1050		# Unit V
5460_MB_CCPS_PWM_NUM_PULSES_MAX	uint16	equals	2500		

5463_MB_CCPS_PWM_HALF_PERIOD	uint16	equals	400		
5464_MB_CCPS_PWM_PULSE_LENGTH_MAX	uint16	equals	250		
5465_MB_CCPS_CHARGE_LIMIT	uint16	equals	40		
5466_MB_CCPS_FINE_TUNE_LIMIT	uint16	equals	20		
5467_MB_CCPS_PWM_PULSE_LENGTH_MIN	uint16	equals	100		
5468_MB_CCPS_PWM_PULSE_LENGTH_INC	uint16	equals	50		
5469_MB_CCPS_FINE_TUNE_WAIT_TIME	uint16	equals	50		
5470_MB_CCPS_INT_LEV_PRIM_CT	uint16	equals	65000		# Unit ADC units
5471_MB_CCPS_P_PAR	uint16	equals	14000		
5472_MB_CCPS_H_PAR	uint16	equals	14000		
5473_MB_CCPS_K_PAR	uint16	equals	6000		
5474_MB_CCPS_I_MAX	uint16	equals	380		
5475_MB_CCPS_PRIM_DC_CALC	uint16	equals	41984		
5476_MB_CCPS_K_FINE_PAR	uint16	equals	8000		
5477_MB_CCPS_PWM_HALF_PERIOD_MAX	uint16	equals	900		# Unit 10 ns
5478_MB_CCPS_ITUNE_TARGET	uint32	equals	20000		
5556_MB_VERSION	uint16	equals	12554		
5557_MB_FPGA_VERSION	uint16	equals	1296		
6002_MB_DISABLE_TRIG_INT_SUM_OUTPUT	uint32	equals	0		
6004_MB_DISABLE_HV_INT_SUM_OUTPUT	uint32	equals	0		
6006_MB_DISABLE_STANDBY_INT_SUM_OUTPUT	uint32	equals	0		
6008_MB_ARC_RECOVERY_DELAY	uint16	equals	1		
6040_MB_FIL_INTERLOCK_CURR_READ_H_LIM	float	equals	16.00		# Unit A
6042_MB_FIL_INTERLOCK_CURR_READ_L_LIM	float	equals	5.00		# Unit A
6044_MB_IGBT_DELAY_1	uint16	equals	0		# Unit 10 ns
6045_MB_IGBT_DELAY_2	uint16	equals	0		# Unit 10 ns
6046_MB_IGBT_DELAY_3	uint16	equals	0		# Unit 10 ns
6047_MB_IGBT_DELAY_4	uint16	equals	0		# Unit 10 ns
6048_MB_IGBT_DELAY_5	uint16	equals	0		# Unit 10 ns
6049_MB_IGBT_DELAY_6	uint16	equals	10000		# Unit 10 ns
6050_MB_NUMBER_OF_IGBT	uint16	equals	5		
6052_MB_IGBT_TRIG_PWM_CTRL	uint16	equals	0		
6093_MB_CCPS_DU_DT_LIMIT_LO	float	equals	0.00		# Unit V/s
6095_MB_CCPS_DU_DT_LIMIT_HI	float	equals	600.00		# Unit V/s
6097_MB_CCPS_DU_DT_NUM_PWM	uint16	equals	128		
6109_MB_DUTY_FACTOR_INT_LEVEL	float	equals	0.13	0.001	
6113_MB_PROTRON_BALANCE	float	equals	0.00		
6114_MB_FORWARD_POW_READ	float	equals	0.00		
6121_MB_REFLECTED_POW_CORRECTION	float	equals	0.00		
6137_MB_MAG_UP_TEMP_LIM	float	equals	100.00		# Unit Celsius

Scandinova M060 file:
v1.0 M060 # File format version and modulator model

Startup checks for Scandinova magnetron modulator

Check format: <REGISTER_ADDRESS>[_OPTIONAL_COMMENT] <REGISTER_TYPE> <CHECK_TYPE> <OPERAND_A> <OPERAND_B> # <COMMENT>
<REGISTER_ADDRESS>: Modbus register address. Can be followed by an optional comment, e.g. 4000_my_register
<REGISTER_TYPE>: uint16, uint32, float (charN not supported)
<CHECK_TYPE>: equals or range
<OPERAND_A>: equals check: expected value, range check: minimum value

<OPERAND_B>: equals check: optional delta value for comparison (default 0 for integers, 1e-6 for floats), range check: maximum value
<COMMENT>: Anything after a "#" is a comment and empty lines are ignored

5126_MB_FIL_SET	float	equals	9.50		
5128_MB_FIL_SET_2	float	equals	0.00		
5130_MB_FIL_RAMP_SPEED	float	equals	0.20	# Unit V or A / sec	
5132_MB_HV_SET	float	range	600.00	850.00	# Unit V
5134_MB_HV_RAMP_SPEED	float	equals	200.00		# Unit V/sec
5189_MB_ENABLE_STANDBY_INTERLOCK	uint32	equals	227		
5191_MB_ENABLE_HV_INTERLOCK	uint32	equals	1		
5193_MB_ENABLE_TRIG_INTERLOCK	uint32	equals	3903		
5195_MB_COM_TIMEOUT_SET	uint16	equals	1500		# Unit ms
5196_MB_PEAK_POWER	float	range	500.00	700.00	# Unit kW
5198_MB_BLOCK_TIME_1	uint16	equals	300		# Unit sec
5199_MB_BLOCK_TIME_2	uint16	equals	0		# Unit sec
5200_MB_CONFIG_WORD	uint32	equals	165916		
5202_MB_PULSE_WIDTH_SET_H_LIM	float	equals	3.50		# Unit us
5204_MB_PULSE_WIDTH_SET_L_LIM	float	equals	0.00		# Unit us
5206_MB_HV_SET_H_LIM	float	equals	700.00		# Unit V
5208_MB_HV_SET_L_LIM	float	equals	0.00		# Unit V
5210_MB_FIL_SET_H_LIM	float	equals	10.00		# Unit V or A
5212_MB_FIL_SET_L_LIM	float	equals	0.00		# Unit V or A
5214_MB_PRF_SET_H_LIM	float	equals	2450.00		# Unit Hz
5216_MB_PRF_SET_L_LIM	float	equals	0.00		# Unit Hz
5218_MB_HV_VOLT_READ_H_LIM	float	equals	1000.00		# Unit V
5220_MB_CT_CVD_READ_DELAY	uint16	equals	130.00		# Unit 10 ns
5222_MB_IGBT_DELAY	uint16	equals	0		# Unit 10 ns
5224_MB_FIL_VOLT_READ_WINDOW	float	equals	5.00		# Unit %
5228_MB_FIL_CURR_READ_WINDOW	float	equals	5.00		# Unit %
5230_MB_PRF_READ_H_LIM	float	equals	2450.00		# Unit Hz
5232_MB_PRF_READ_L_LIM	float	equals	0.00		# Unit Hz
5234_MB_FIL_WARNING_VOLT_READ_H_LIM	float	equals	10.00		# Unit V
5236_MB_FIL_WARNING_VOLT_READ_L_LIM	float	equals	5.00		# Unit V
5238_MB_FIL_WARNING_CURR_READ_H_LIM	float	equals	14.00		# Unit A
5240_MB_FIL_WARNING_CURR_READ_L_LIM	float	equals	5.00		# Unit A
5242_MB_MAX_ARC_CONSECUTIVE	uint16	equals	10		
5243_MB_MAX_ARC_SHORT_WINDOW	uint16	equals	25	# Arcs during one second	
5244_MB_MAX_ARC_LONG_WINDOW	uint16	equals	100	# Arcs during one hour	
5245_MB_ARC_RECOVERY_START	uint16	equals	10		# Unit 10 ns
5246_MB_ARC_RECOVERY_INC	uint16	equals	1		# Unit 10 ns
5247_MB_A_INPUT_DELAY	uint16	equals	0		# Unit 10 ns
5248_MB_B_INPUT_DELAY	uint16	equals	1000		# Unit 10 ns
5249_MB_C_INPUT_DELAY	uint16	equals	1000		# Unit 10 ns
5250_MB_SW_INPUT_DELAY	uint16	equals	0		# Unit 10 ns
5251_MB_TRIG_INPUT_MAX_WIDTH	uint16	equals	1000		# Unit 10 ns
5252_MB_MAX_AVERAGE_POWER	float	equals	0.925		# Unit kW

A check for set calibration values starting from address 5333 (note: read calibration values have the order of uint16 and float swapped)

5333_MB_FIL_RUNBACK_TABLE_X0	float	equals	0.0
5335_MB_FIL_RUNBACK_TABLE_Y0	uint16	equals	100
5336_MB_FIL_RUNBACK_TABLE_X1	float	equals	200.0
5338_MB_FIL_RUNBACK_TABLE_Y1	uint16	equals	93

5339_MB_FIL_RUNBACK_TABLE_X2	float	equals	400.0		
5341_MB_FIL_RUNBACK_TABLE_Y2	uint16	equals	86		
5342_MB_FIL_RUNBACK_TABLE_X3	float	equals	600.0		
5344_MB_FIL_RUNBACK_TABLE_Y3	uint16	equals	79		
5345_MB_FIL_RUNBACK_TABLE_X4	float	equals	800.0		
5347_MB_FIL_RUNBACK_TABLE_Y4	uint16	equals	72		
5459_MB_CCPS_INT_LEV_HV	uint16	equals	1100		# Unit V
5460_MB_CCPS_PWM_NUM_PULSES_MAX	uint16	equals	1		
5462_MB_CCPS_DU_DT_NUM_PWM_WAIT	uint16	equals	46		
5463_MB_CCPS_PWM_HALF_PERIOD	uint16	equals	400		
5464_MB_CCPS_PWM_PULSE_LENGTH_MAX	uint16	equals	370		
5465_MB_CCPS_CHARGE_LIMIT	uint16	equals	15		
5466_MB_CCPS_FINE_TUNE_LIMIT	uint16	equals	0		
5467_MB_CCPS_PWM_PULSE_LENGTH_MIN	uint16	equals	30		
5468_MB_CCPS_PWM_PULSE_LENGTH_INC	uint16	equals	10		
5469_MB_CCPS_FINE_TUNE_WAIT_TIME	uint16	equals	200		
5471_MB_CCPS_P_PAR	uint16	equals	50000		
5472_MB_CCPS_H_PAR	uint16	equals	17000		
5473_MB_CCPS_K_PAR	uint16	equals	8000		
5474_MB_CCPS_I_MAX	uint16	equals	250		
5475_MB_CCPS_PRIM_DC_CALC	uint16	equals	41984		
5476_MB_CCPS_K_FINE_PAR	uint16	equals	6000		
5477_MB_CCPS_PWM_HALF_PERIOD_MAX	uint16	equals	400		# Unit 10 ns
5478_MB_CCPS_ITUNE_TARGET	uint32	equals	16777215		
5556_MB_VERSION	uint16	equals	16148		
5557_MB_FPGA_VERSION	uint16	equals	1309		
6002_MB_DISABLE_TRIG_INT_SUM_OUTPUT	uint32	equals	0		
6004_MB_DISABLE_HV_INT_SUM_OUTPUT	uint32	equals	0		
6006_MB_DISABLE_STANDBY_INT_SUM_OUTPUT	uint32	equals	0		
6008_MB_ARC_RECOVERY_DELAY	uint16	equals	0		
6040_MB_FIL_INTERLOCK_CURR_READ_H_LIM	float	equals	16.00		# Unit A
6042_MB_FIL_INTERLOCK_CURR_READ_L_LIM	float	equals	5.00		# Unit A
6045_MB_IGBT_DELAY_2	uint16	equals	0		# Unit 10 ns
6046_MB_IGBT_DELAY_3	uint16	equals	10000		# Unit 10 ns
6047_MB_IGBT_DELAY_4	uint16	equals	10000		# Unit 10 ns
6048_MB_IGBT_DELAY_5	uint16	equals	10000		# Unit 10 ns
6049_MB_IGBT_DELAY_6	uint16	equals	10000		# Unit 10 ns
6050_MB_NUMBER_OF_IGBT	uint16	equals	2		
6052_MB_IGBT_TRIG_PWM_CTRL	uint16	equals	0		
6053_TIP1N	uint16	equals	0		
6093_MB_CCPS_DU_DT_LIMIT_LO	float	equals	0.00		# Unit V/s
6095_MB_CCPS_DU_DT_LIMIT_HI	float	equals	600.00		# Unit V/s
6097_MB_CCPS_DU_DT_NUM_PWM	uint16	equals	20		
6109_MB_DUTY_FACTOR_INT_LEVEL	float	equals	0.13	0.001	
6118_MB_FORWARD_POW_CORRECTION	float	equals	0		
6120_MB_REFL_AND_FORW_SAMPLE_DELAY	uint16	equals	150		
6121_MB_REFLECTED_POW_CORRECTION	float	equals	0.00		
6137_MB_MAG_TEMP_TRIP_LIMIT	float	equals	100.00		# Unit Celsius
6139_MB_ARC_DETECT_TRIP_LIMIT	uint32	equals	5060		# Unit raw ADC
6143_MB_FAN_CONTROL_PC	float	equals	0.00		# Unit %
6145_MB_TANK_TEMP_TRIP_LIMIT	float	equals	60.00		# Unit Celsius
6147_MB_MAGFIL_CABLE_N_AVERAGE	uint16	equals	10		
6148_MB_MAGFIL_CABLE_V_H_LIM	float	equals	1.00		# Unit V
6150_MB_MAGFIL_CABLE_A_L_LIM	float	equals	0.20		# Unit V

6153_MB_TRIG_VOLT_H_LIM	float	equals	10.00	# Unit V
6155_MB_TRIG_VOLT_L_LIM	float	equals	10.00	# Unit V
6157_MB_TRIG_VOLT_ARC_H_LIM	float	equals	30.00	# Unit V
6159_MB_TRIG_VOLT_ARC_L_LIM	float	equals	30.00	# Unit V
6167_MB_FAN_INTERLOCK_FILTER	float	equals	10.00	# Unit s
6169_MB_PT100_MAG_INTERLOCK_FILTER	float	equals	10.00	# Unit s
6171_MB_PT100_TANK_INTERLOCK_FILTER	float	equals	10.00	# Unit s