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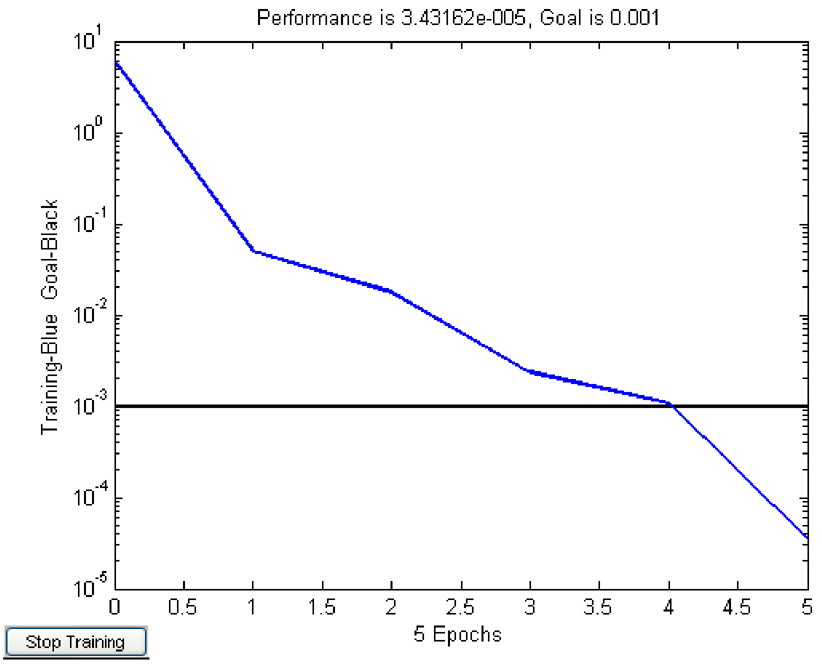
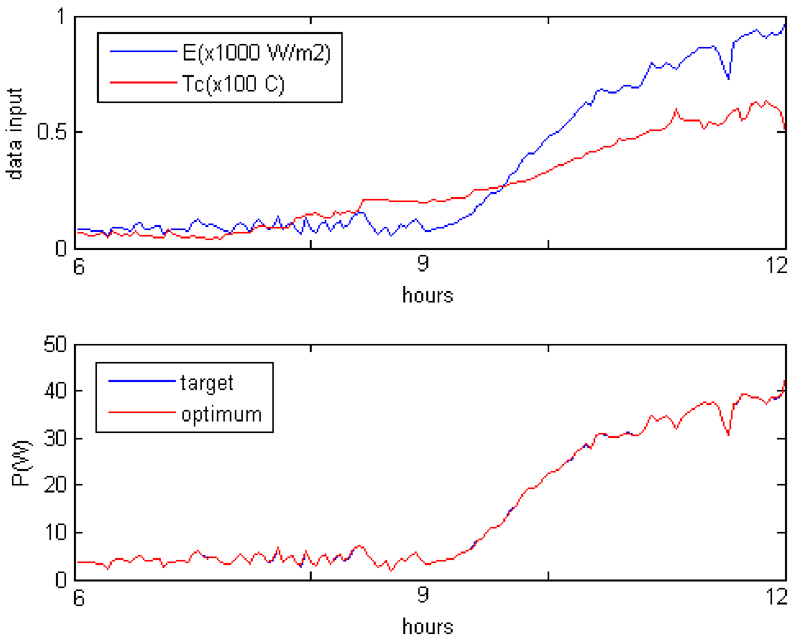
Lampiran 1**. Hasil proses training RBF untuk masing-masing modul**

a. ASE-50-ATF/17 (EFG mc-Si)

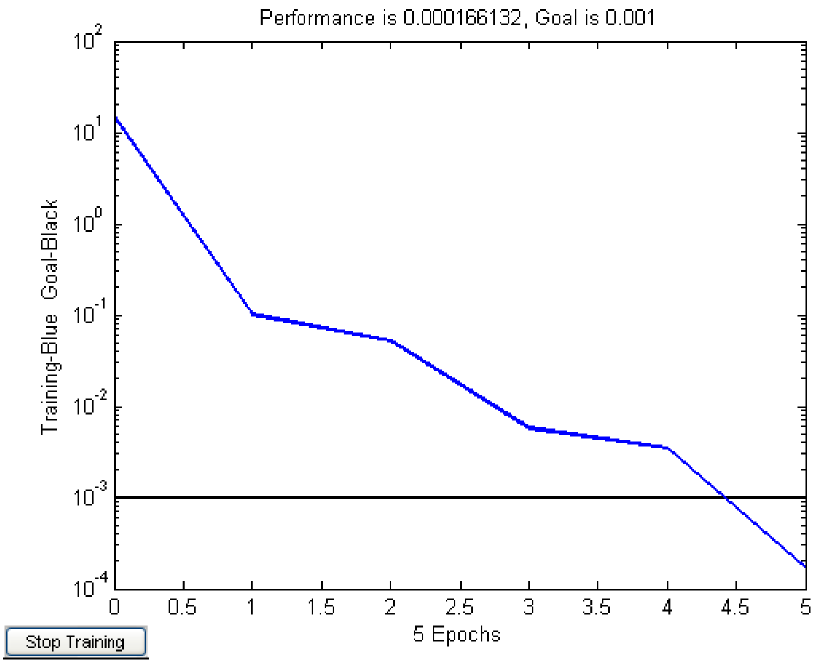


a.1 Training epoch RBF

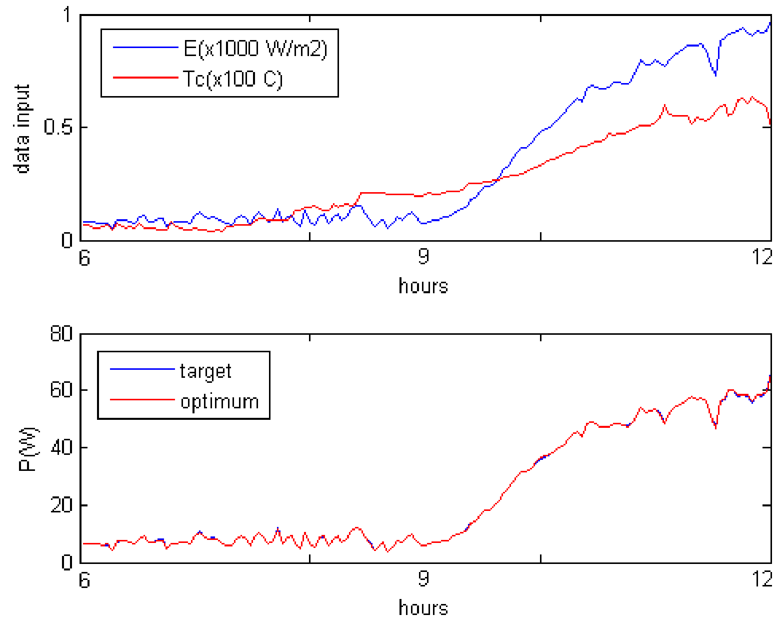


a.2 Training data dan estimasi hasil training

b. Kyocera KC-80 (wafer mc-Si)

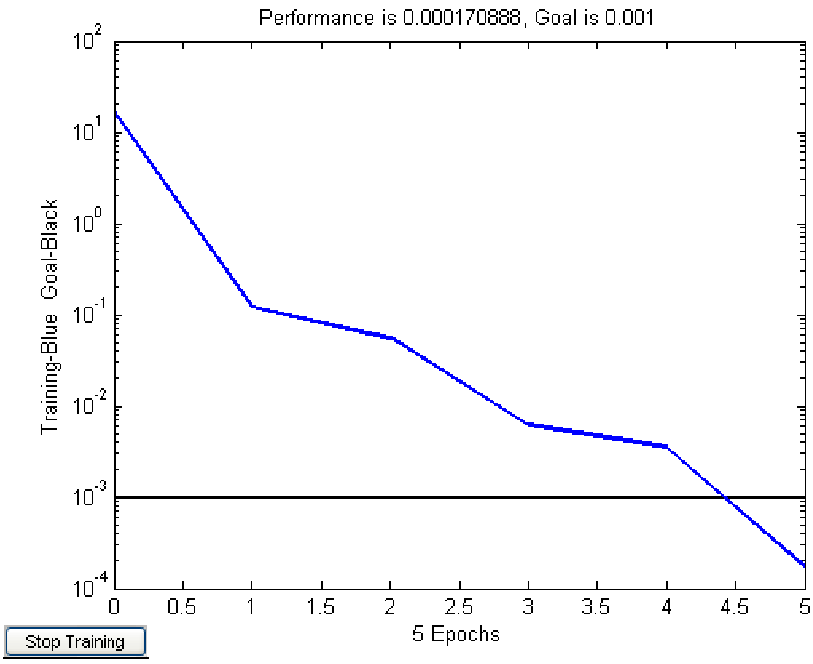


b.1 Training epoch RBF

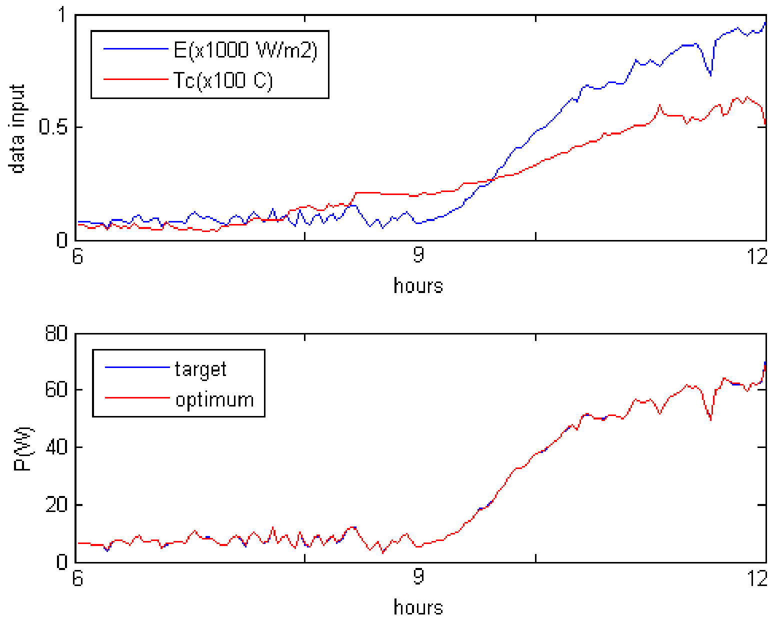


b.2 Training data dan estimasi hasil training

c. BP Solar BP-585 (c-Si)

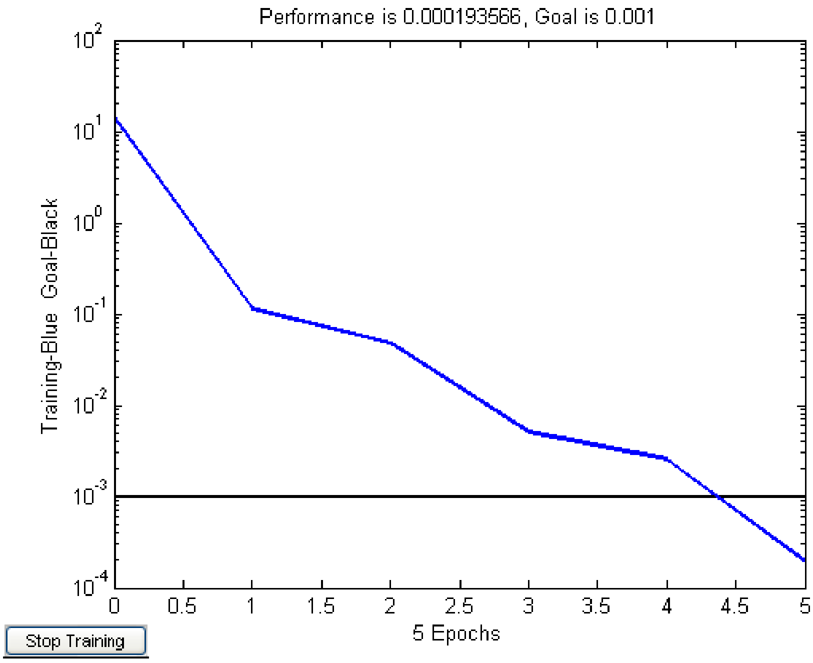


c.1 Training epoch RBF

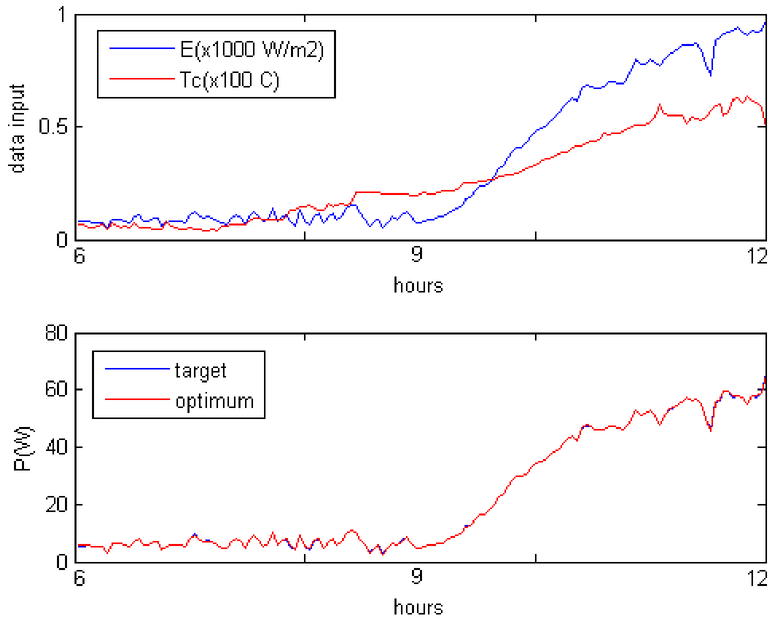


c.2 Training data dan estimasi hasil training

d. AstroPower AP-8225 (thin film Si)



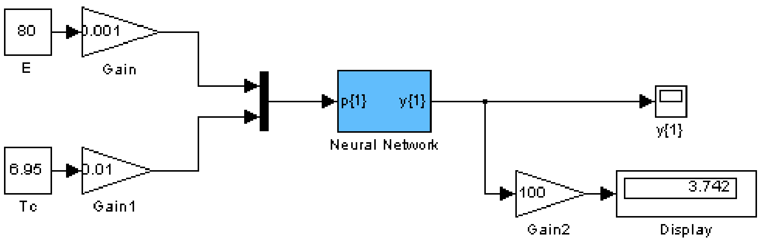
d.1 Training epoch RBF



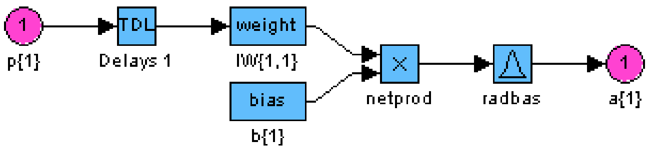
d.2 Training data dan estimasi hasil training

Lampiran 2. Struktur RBF yang optimal untuk setiap jenis modul

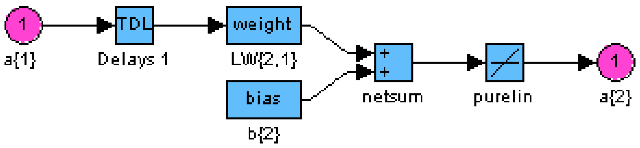
a. ASE-50-ATF/17 (EFG mc-Si)



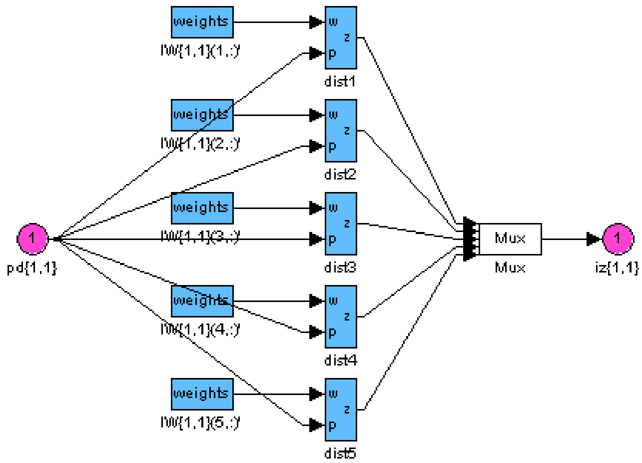
a.1 Struktur RBF



a.2 Radial basis function pada layer-1

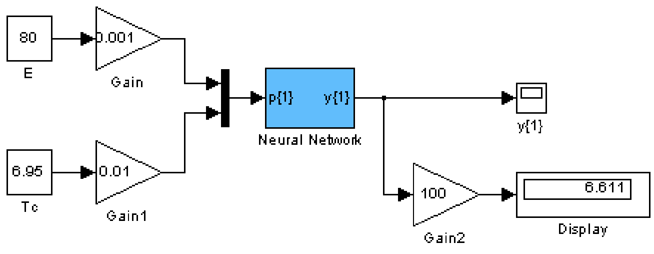


a.3 Purelin transfer function pada layer-2

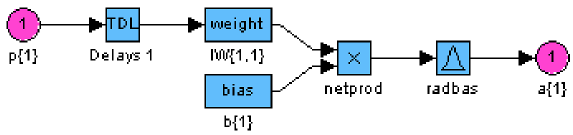


a.4 Distance Euclidean function pada layer 1

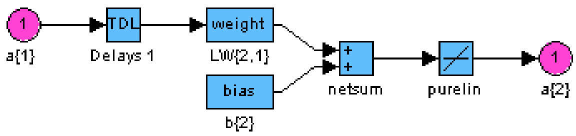
b. Kyocera KC-80 (wafer mc-Si)



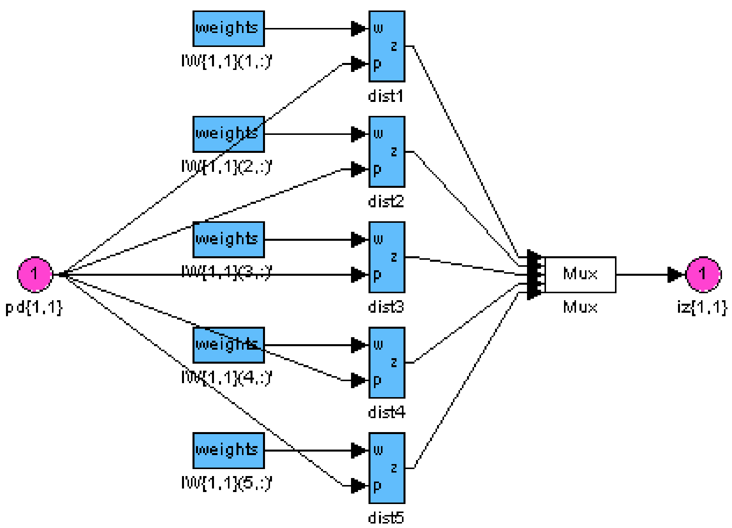
b.1 Struktur RBF



b.2 Radial basis function pada layer-1

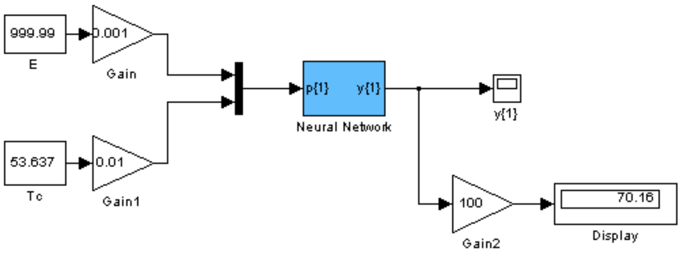


b.3 Purelin transfer function pada layer-2

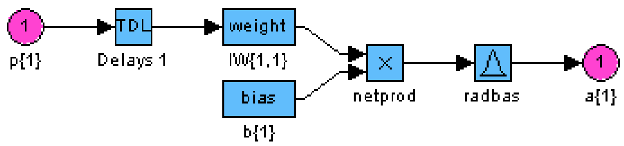


b.4 Distance Euclidean function pada layer-1

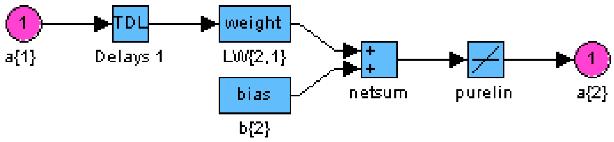
c. BP Solar BP-585 (c-Si)



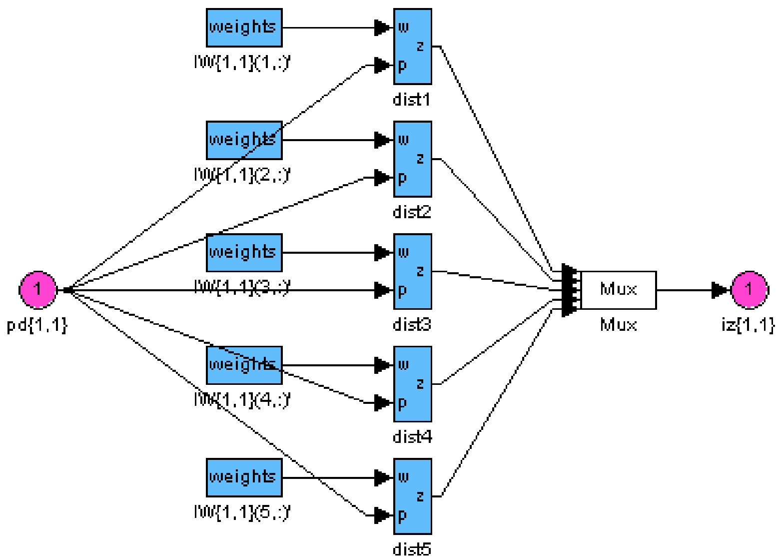
c.1 Struktur RBF



c.2 Radial basis function pada layer-1

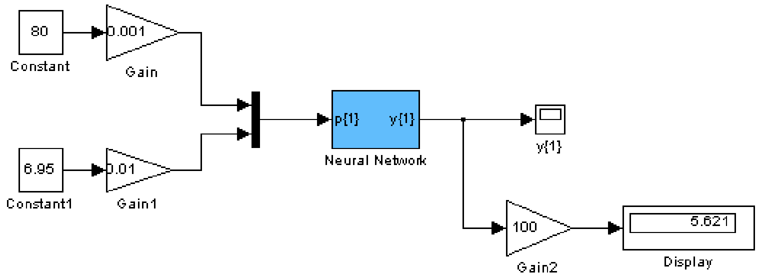


c.3 Purelin transfer function pada layer-2

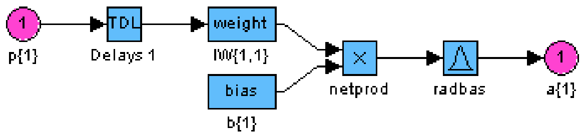


c.4 Distance Euclidean function pada layer-1

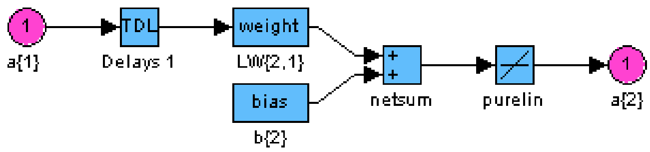
d. AstroPower AP-8225 (thin film Si)



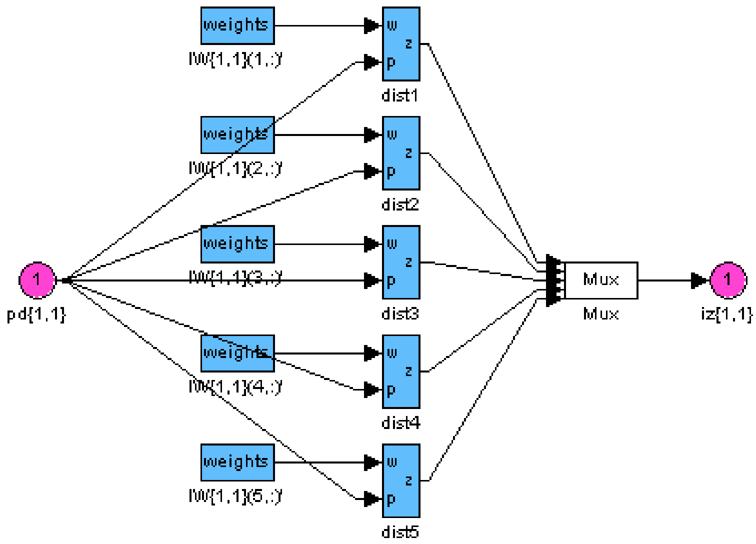
d.1 Struktur RBF



d.2 Radial basis function pada layer-1



d.3 Purelin transfer function pada layer-2



d.4 Distance Euclidean function pada layer-1

Lampiran 3. Matriks weight W_1, W_2 dan bias b_1, b_2 untuk struktur RBF masing-masing modul

a. ASE-50-ATF/17 (EFG mc-Si)

$$W_1 = \begin{bmatrix} 0.93668 & 0.62956 \\ 0.15499 & 0.24175 \\ 0.97499 & 0.49187 \\ 0.92666 & 0.61739 \\ 0.77338 & 0.54455 \end{bmatrix}$$

$$W_2 = \begin{bmatrix} 274.37 & -1.1658 & 15.862 & -313.19 & 24.859 \end{bmatrix}$$

$$b_1 = \begin{bmatrix} 0.83255 \\ 0.83255 \\ 0.83255 \\ 0.83255 \\ 0.83255 \end{bmatrix}$$

$$b_2 = \begin{bmatrix} -0.08269 \end{bmatrix}$$

b. Kyocera KC-80 (wafer mc-Si)

$$W_1 = \begin{bmatrix} 0.93668 & 0.62956 \\ 0.05001 & 0.20510 \\ 0.97499 & 0.49187 \\ 0.92666 & 0.61739 \\ 0.77338 & 0.54455 \end{bmatrix}$$

$$W_2 = \begin{bmatrix} 381.73 & -1.2507 & 22.727 & -435.4 & 33.423 \end{bmatrix}$$

$$b_1 = \begin{bmatrix} 0.83255 \\ 0.83255 \\ 0.83255 \\ 0.83255 \\ 0.83255 \end{bmatrix}$$

$$b_2 = \begin{bmatrix} -0.23785 \end{bmatrix}$$

c. BP Solar BP-585 (c-Si)

$$W_1 = \begin{bmatrix} 0.93668 & 0.62956 \\ 0.05001 & 0.20510 \\ 0.97499 & 0.49187 \\ 0.92666 & 0.61739 \\ 0.77338 & 0.54455 \end{bmatrix}$$

$$W_2 = \begin{bmatrix} 389.02 & -1.2355 & 23.278 & -443.53 & 33.783 \end{bmatrix}$$

$$b_1 = \begin{bmatrix} 0.83255 \\ 0.83255 \\ 0.83255 \\ 0.83255 \\ 0.83255 \end{bmatrix}$$

$$b_2 = \begin{bmatrix} -0.26296 \end{bmatrix}$$

d. AstroPower AP-8225 (thin film Si)

$$W_1 = \begin{bmatrix} 0.93668 & 0.62956 \\ 0.05001 & 0.20510 \\ 0.97499 & 0.49187 \\ 0.92666 & 0.61739 \\ 0.77338 & 0.54455 \end{bmatrix}$$

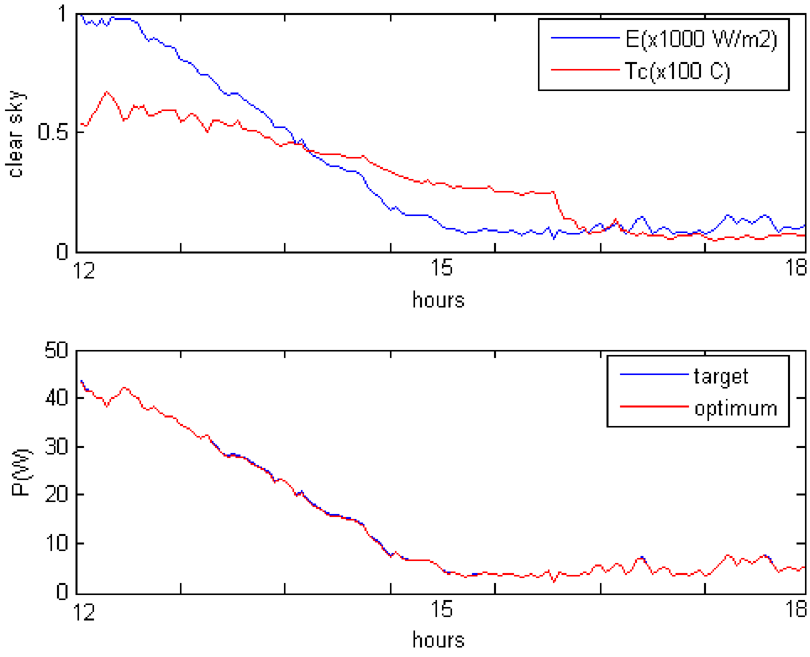
$$W_2 = \begin{bmatrix} 332.93 & -0.91499 & 20.339 & -379.29 & 28.28 \end{bmatrix}$$

$$b_1 = \begin{bmatrix} 0.83255 \\ 0.83255 \\ 0.83255 \\ 0.83255 \\ 0.83255 \end{bmatrix}$$

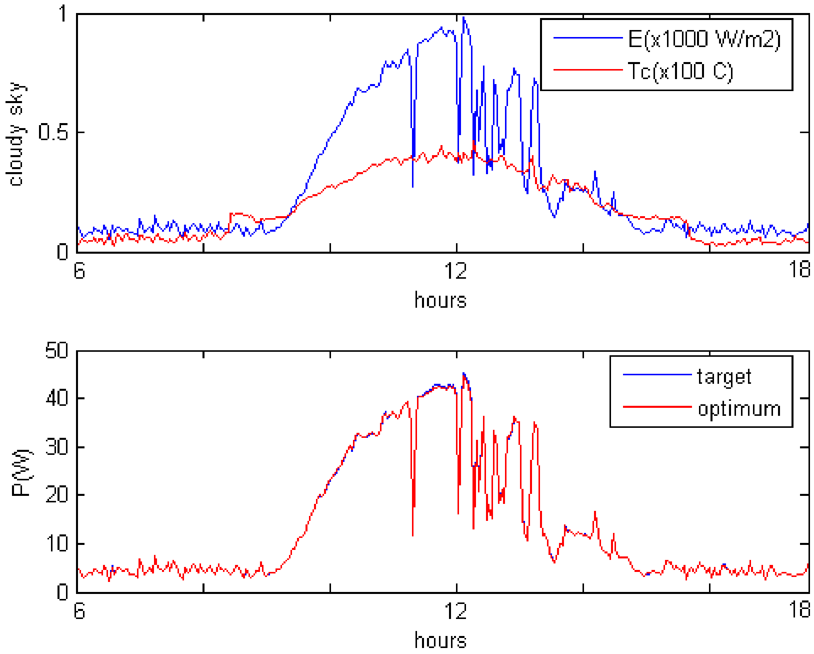
$$b_2 = \begin{bmatrix} -0.32964 \end{bmatrix}$$

fik hasil validasi untuk setiap jenis modul dengan metode RBF

a. ASE-50-ATF/17 (EFG mc-Si)

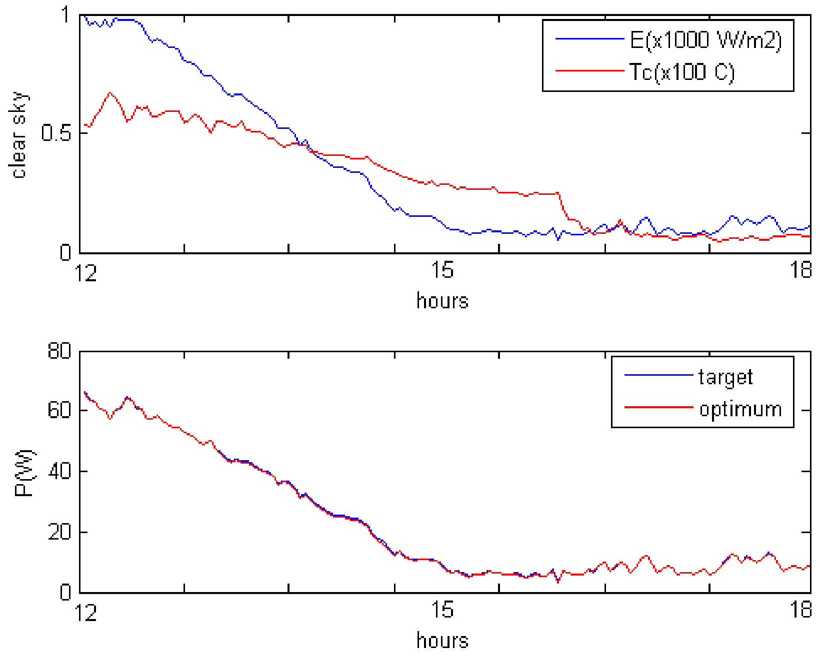


a.1 Validasi pada kondisi cuaca cerah

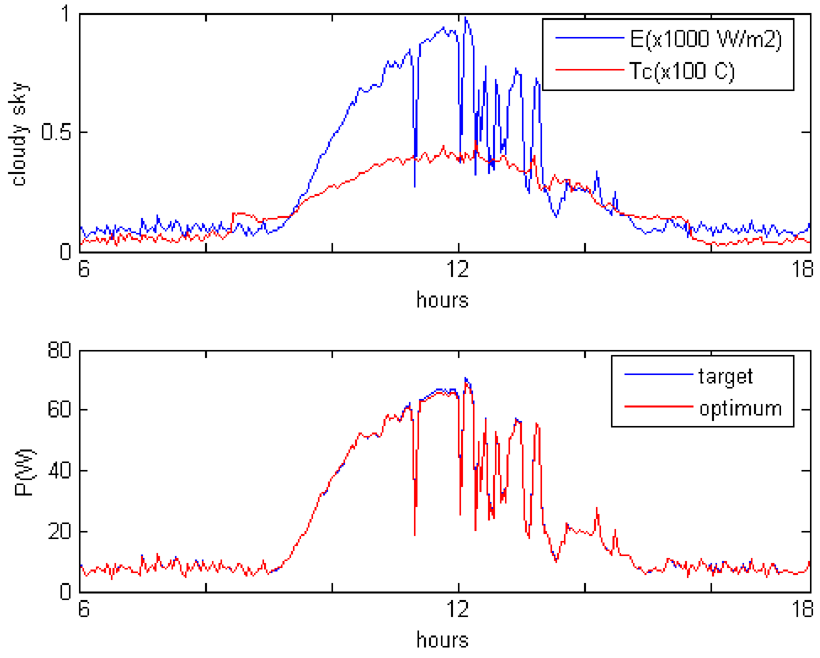


a.2 Validasi pada kondisi cuaca berawan

0 (wafer mc-Si)

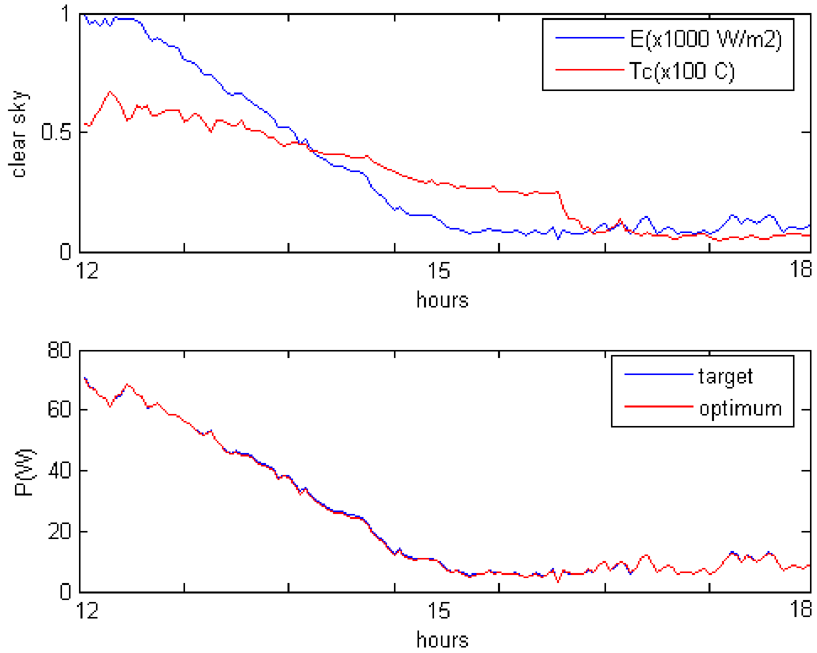


b.1 Validasi pada kondisi cuaca cerah

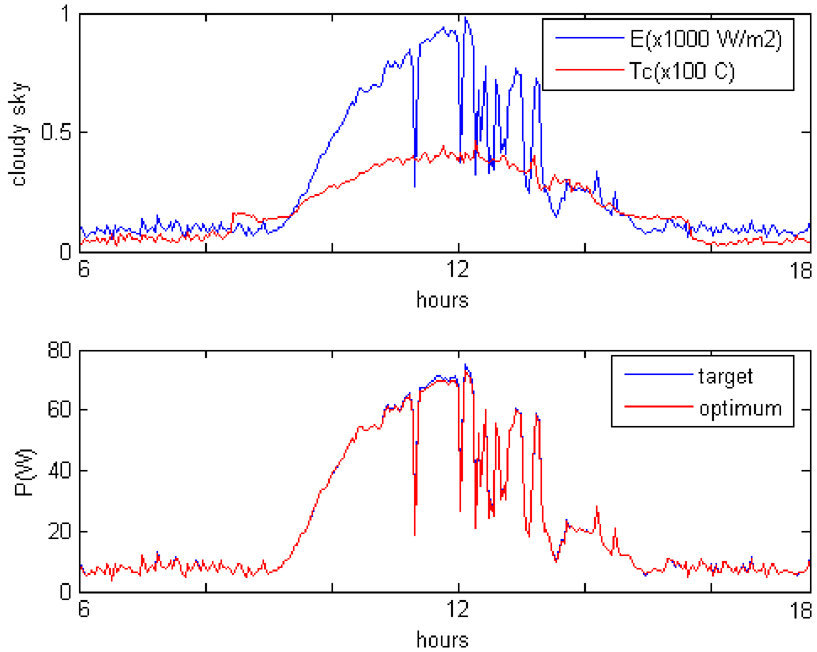


b.2 Validasi pada kondisi cuaca berawan

85 (c-Si)

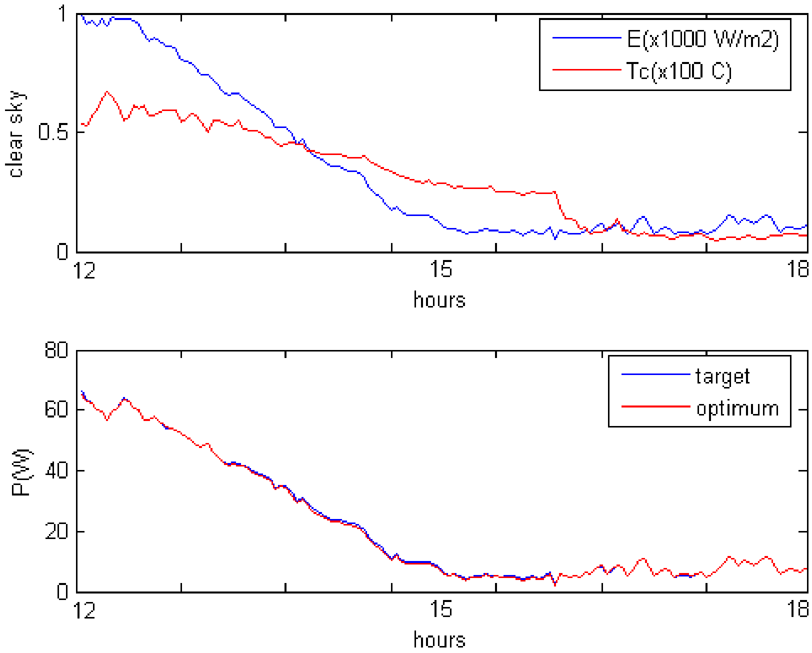


c.1 Validasi pada kondisi cuaca cerah

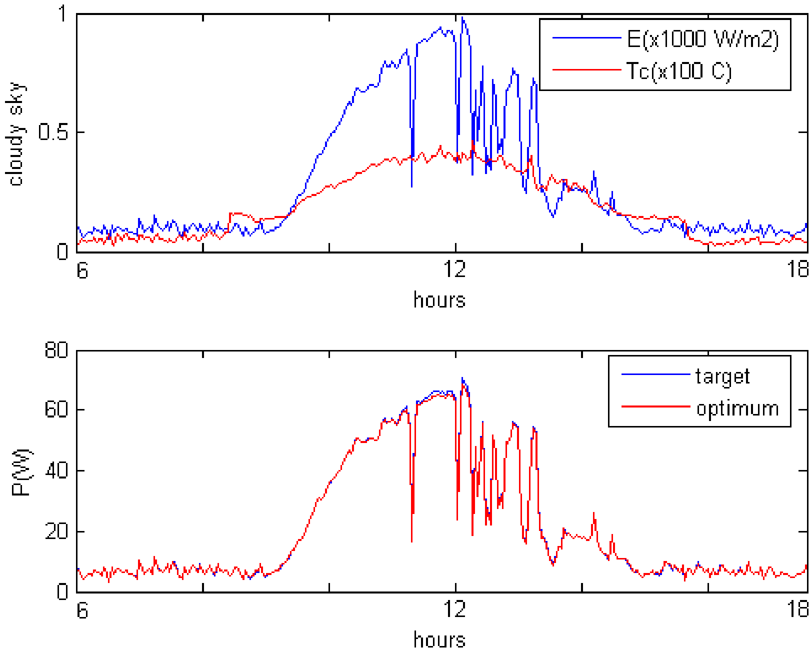


c.2 Validasi pada kondisi cuaca berawan

P-8225 (thin film Si)

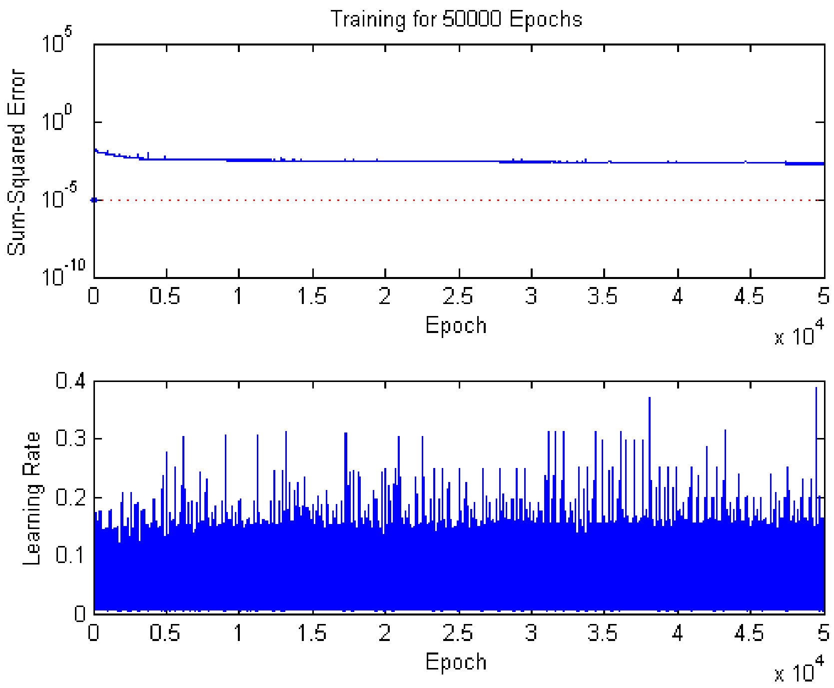


d.1 Validasi pada kondisi cuaca cerah

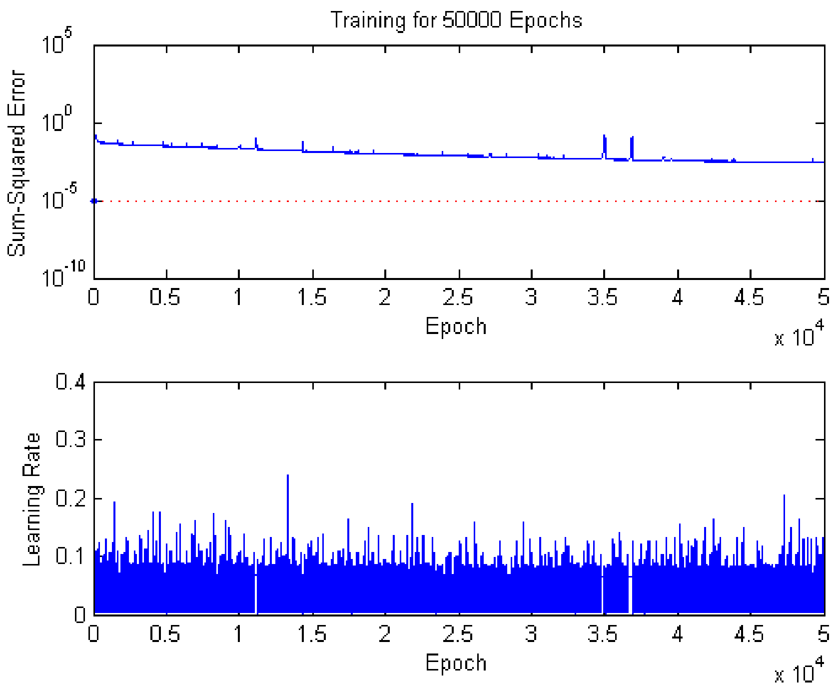


d.2 Validasi pada kondisi cuaca berawan

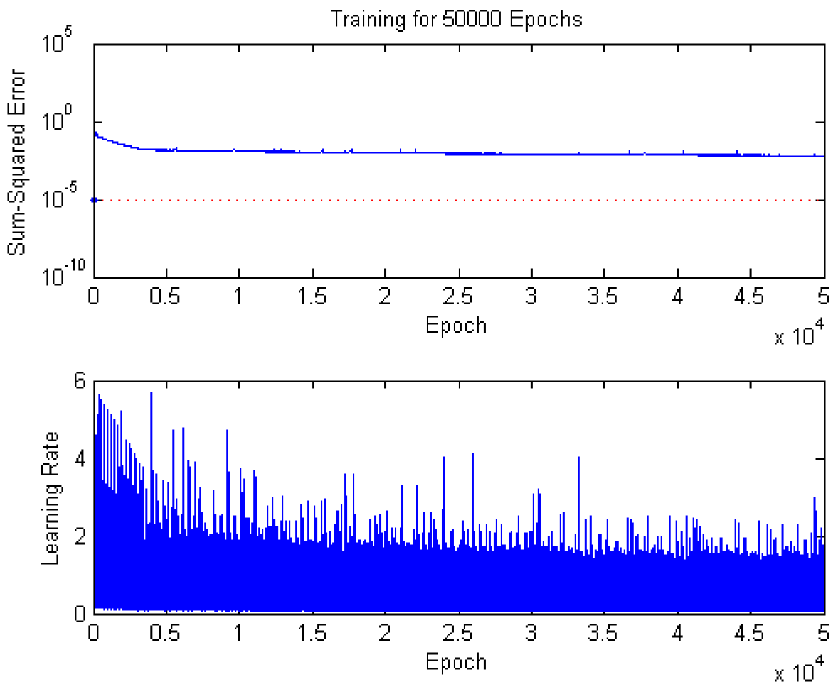
ining error dan learning rate TFFN untuk masing-masing modul



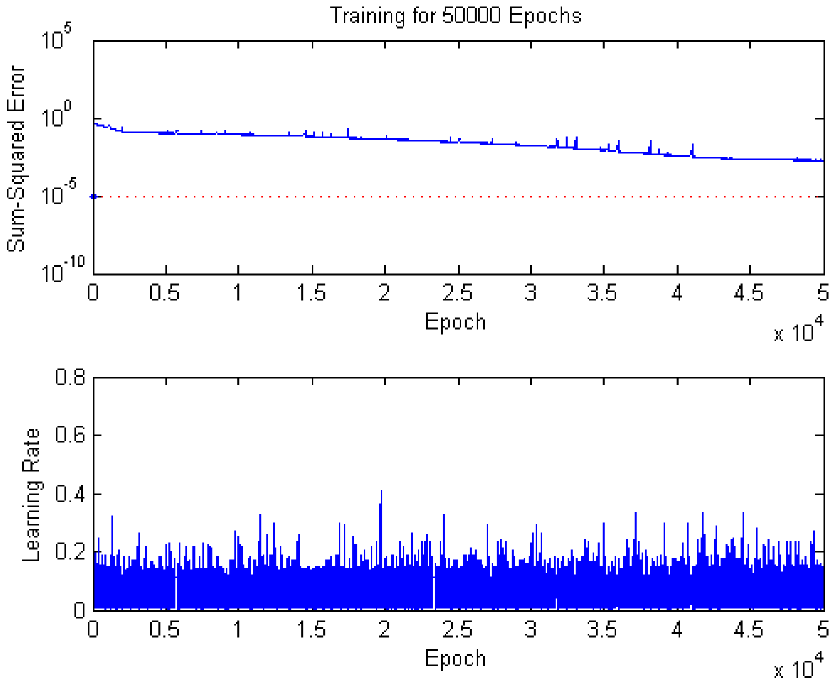
a. ASE-50-ATF/17 (EFG mc-Si)



b. Kyocera KC-80 (wafer mc-Si)

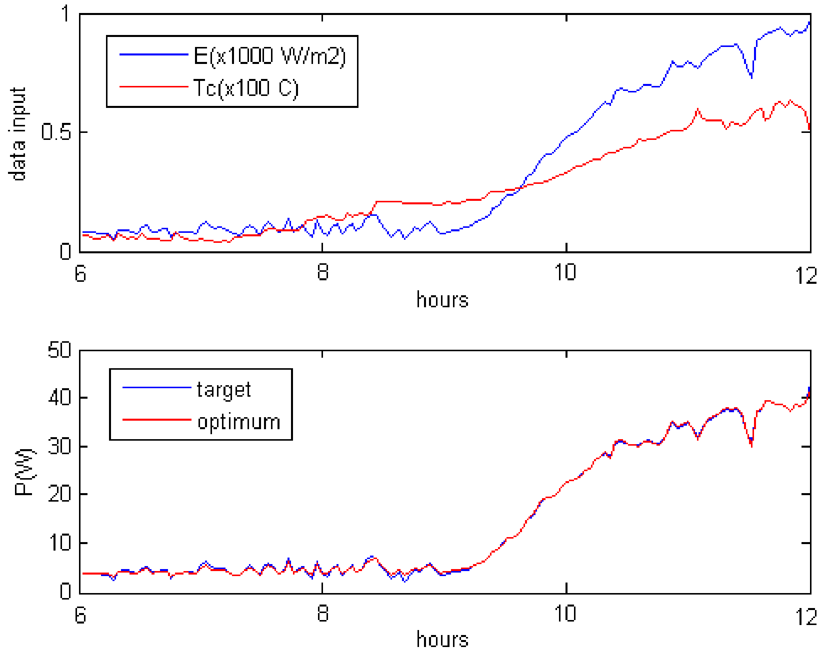


c. BP Solar BP-585 (c-Si)

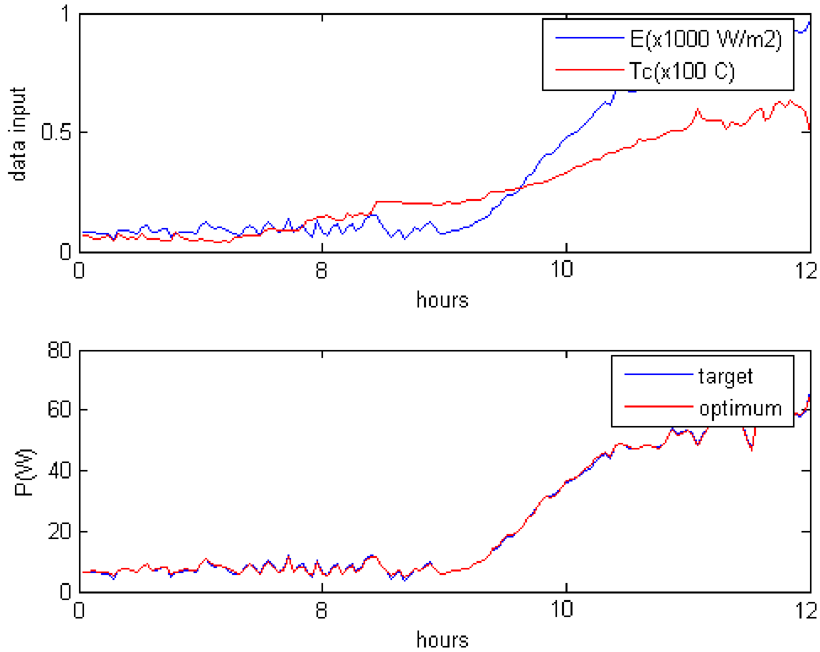


d. AstroPower AP-8225 (thin film Si)

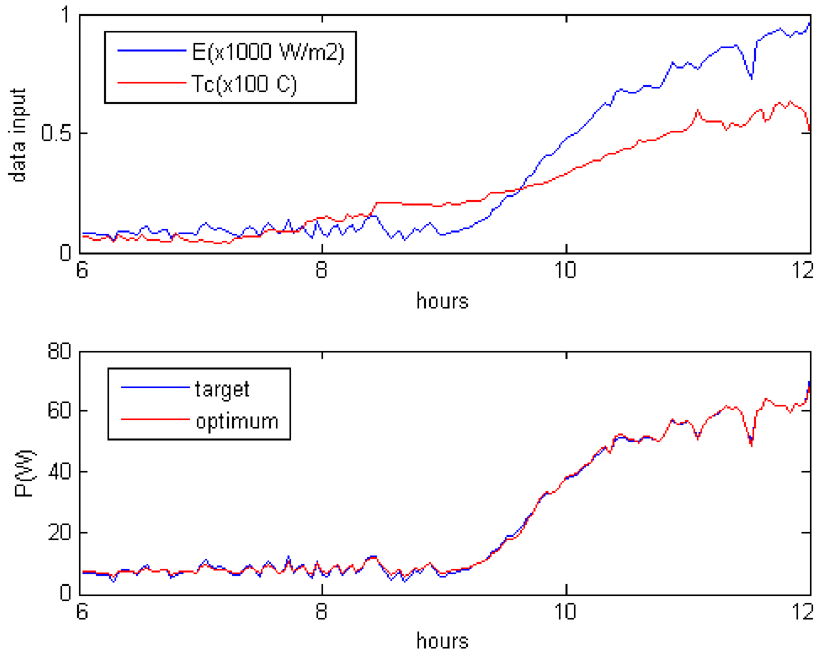
Lampiran 6. Tipikal grafik selama proses training pada masing-masing modul



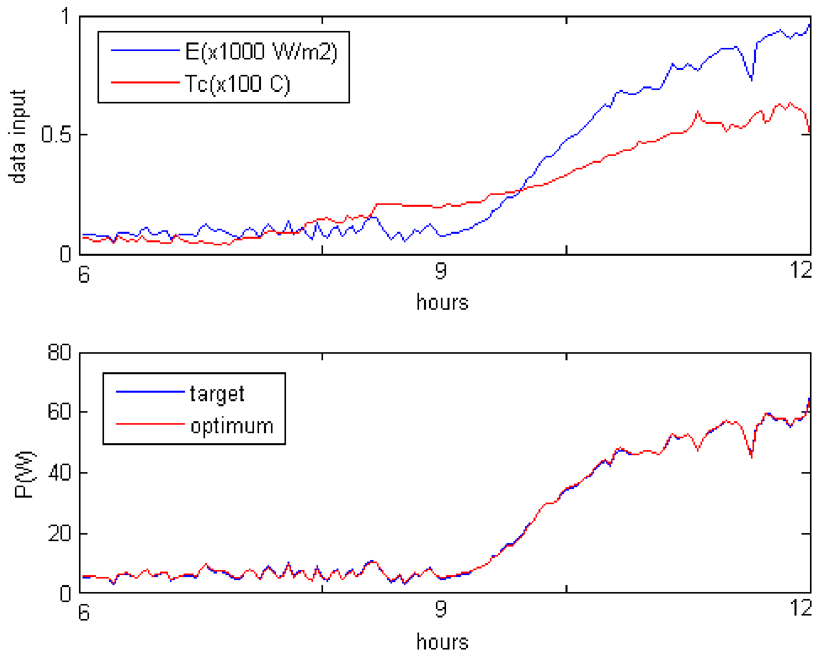
a. ASE-50-ATF/17 (EFG mc-Si)



b. Kyocera KC-80 (wafer mc-Si)



c. BP Solar BP-585 (c-Si)



d. AstroPower AP-8225 (thin film Si)

Lampiran 7. Matriks weight W_1, W_2 dan bias b_1, b_2 pada jaringan TFFN

a. ASE-50-ATF/17 (EFG mc-Si)

$$W_1 = \begin{bmatrix} 6.7073 & -4.5898 \\ 3.5050 & 13.0540 \end{bmatrix}$$

$$W_2 = \begin{bmatrix} 0.38654 & 0.097773 \end{bmatrix}$$

$$b_1 = \begin{bmatrix} -2.0141 \\ -3.5449 \end{bmatrix}$$

$$b_2 = \begin{bmatrix} 0.02557 \end{bmatrix}$$

b. Kyocera KC-80 (wafer mc-Si)

$$W_1 = \begin{bmatrix} -0.44771 & -22.895 \\ 13.182 & -10.475 \\ 12.885 & -10.269 \\ 14.896 & 5.7778 \\ 11.916 & 13.162 \\ 9.4815 & -17.493 \end{bmatrix}$$

$$W_2 = \begin{bmatrix} -0.03002 & 0.20389 & 0.22361 & 0.16597 & 0.073449 & -0.00707 \end{bmatrix}$$

$$b_1 = \begin{bmatrix} 12.338 \\ -1.8853 \\ -5.5894 \\ -3.3871 \\ -10.308 \\ 0.21376 \end{bmatrix}$$

$$b_2 = \begin{bmatrix} 0.038875 \end{bmatrix}$$

c. BP Solar BP-585 (c-Si)

$$W_1 = \begin{bmatrix} -2.5697 & 1.604 \\ 7.9877 & 11.218 \end{bmatrix}$$

$$W_2 = \begin{bmatrix} -9.7351 & 1.4112 \end{bmatrix}$$

d. AstroPower AP-8225 (thin film Si)

$$W_1 = \begin{bmatrix} 3.981 & -2.3986 \\ -0.23263 & -13.351 \end{bmatrix}$$

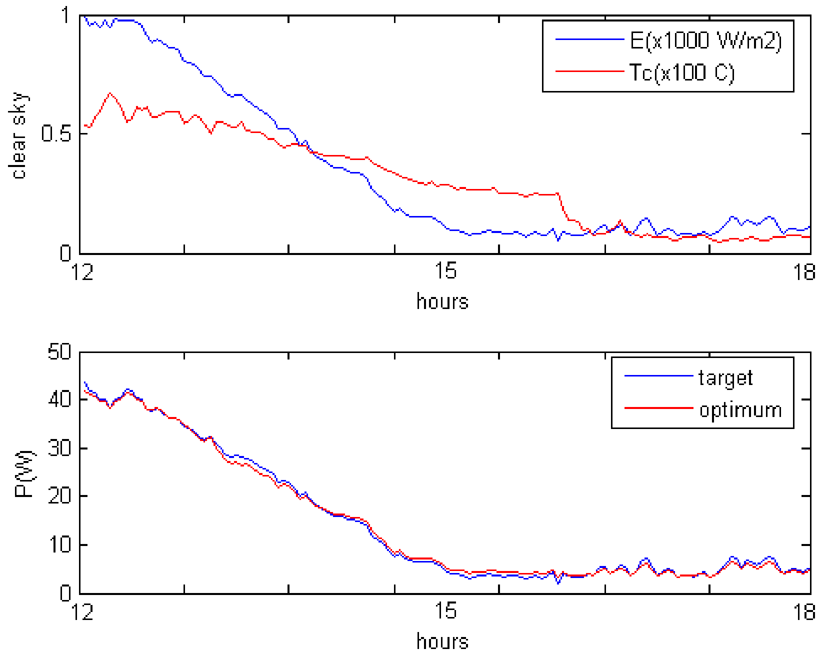
$$W_2 = \begin{bmatrix} 0.88294 & -0.13103 \end{bmatrix}$$

$$b_1 = \begin{bmatrix} -1.0612 \\ 2.3453 \end{bmatrix}$$

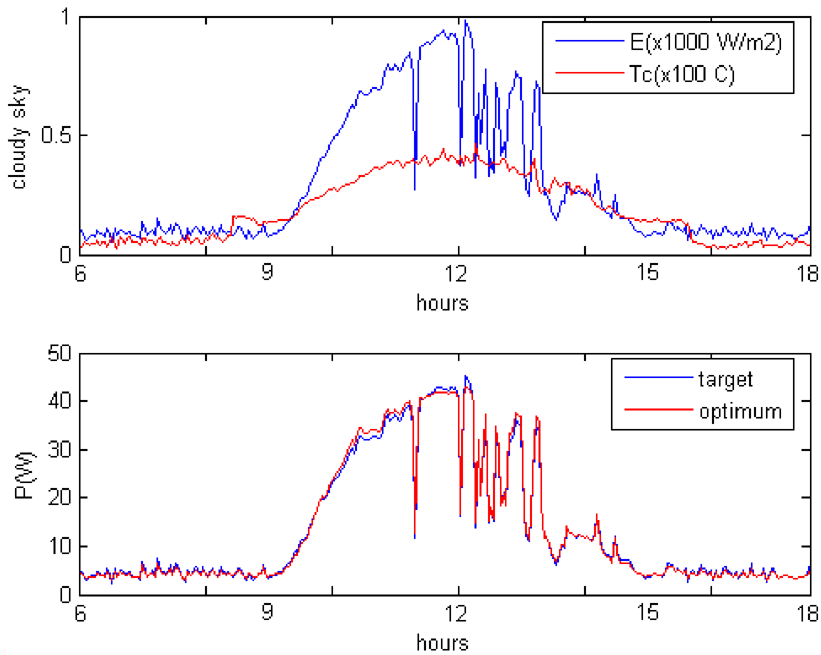
$$b_2 = \begin{bmatrix} -0.09217 \end{bmatrix}$$

Lampiran 8. Hasil validasi daya maksimum untuk masing-masing modul dengan metode TFFN

a. ASE-50-ATF/17 (EFG mc-Si)

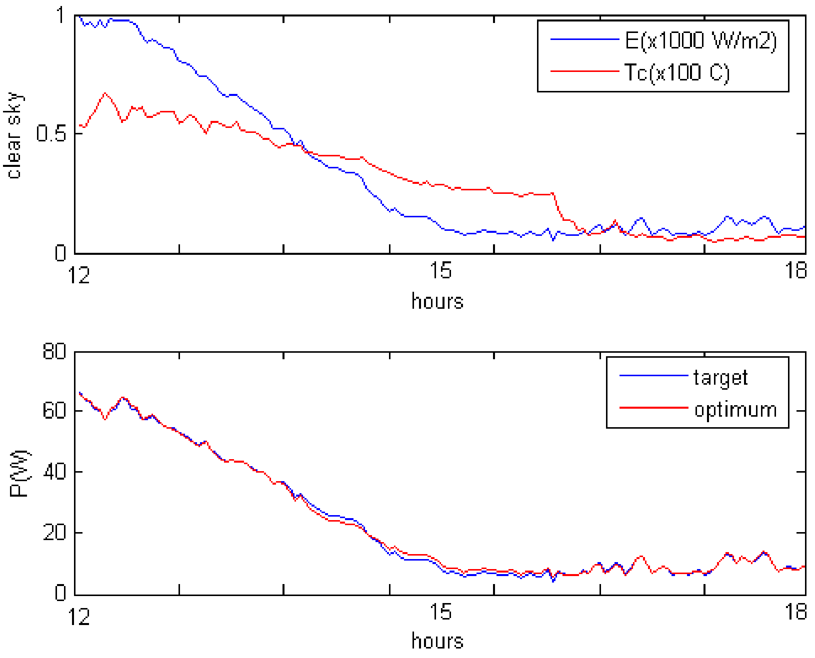


a.1 Validasi pada kondisi cuaca cerah

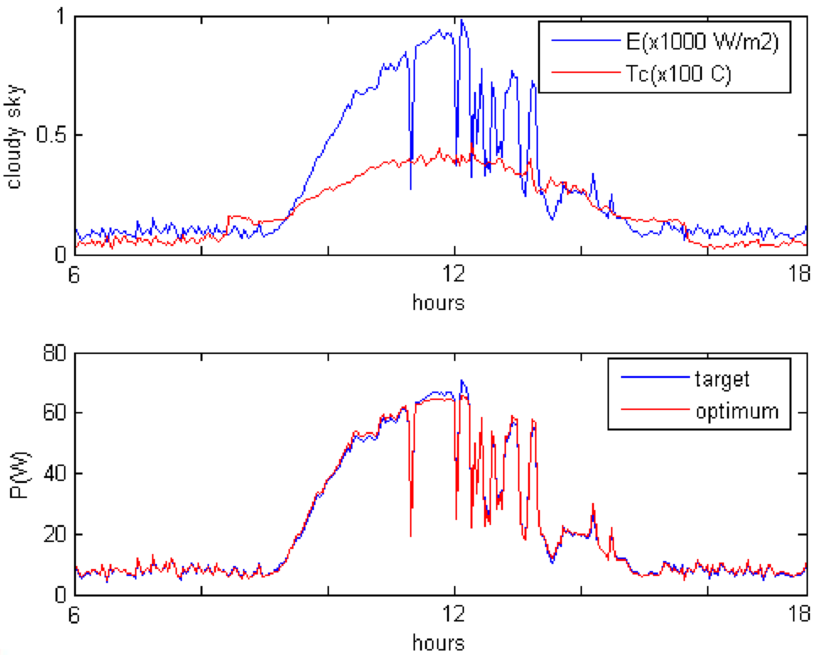


a.2 Validasi pada kondisi cuaca berawan

b. Kyocera KC-80 (wafer mc-Si)

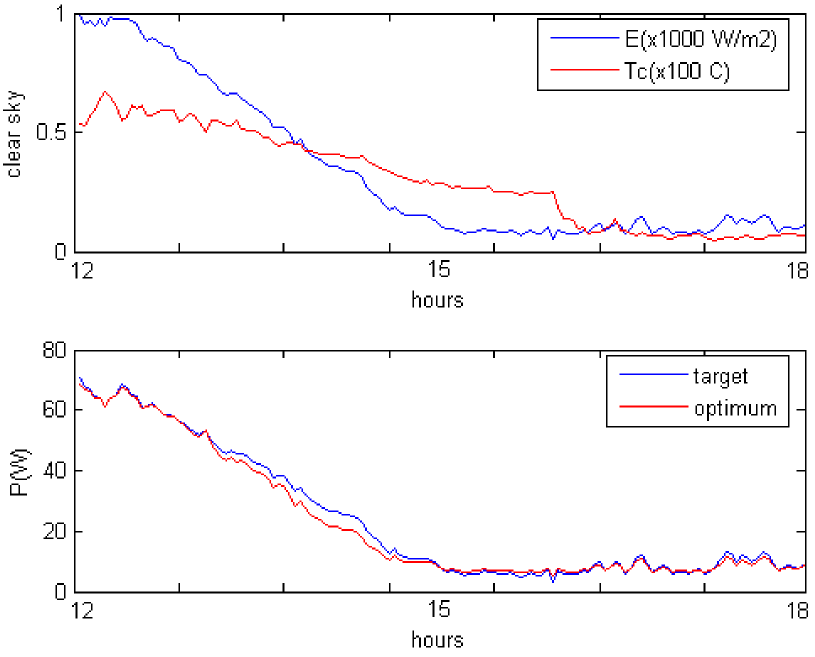


b.1 Validasi pada kondisi cuaca cerah

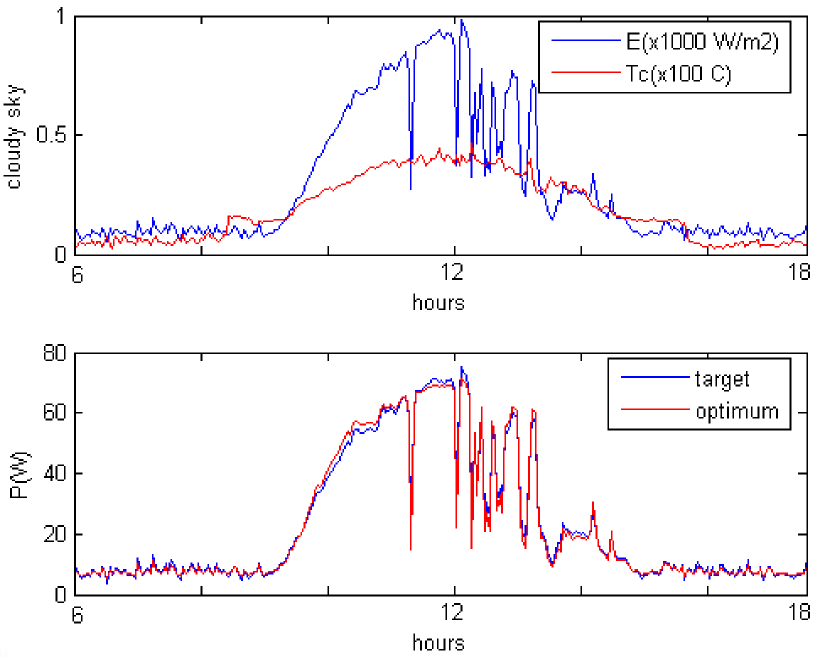


b.2 Validasi pada kondisi cuaca berawan

c. BP Solar BP-585 (c-Si)

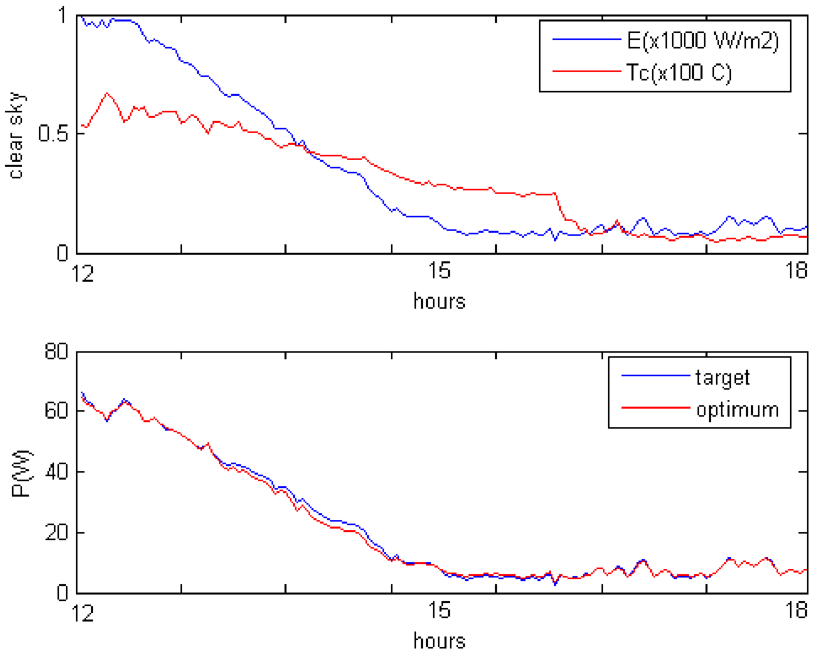


c.1 Validasi pada kondisi cuaca cerah

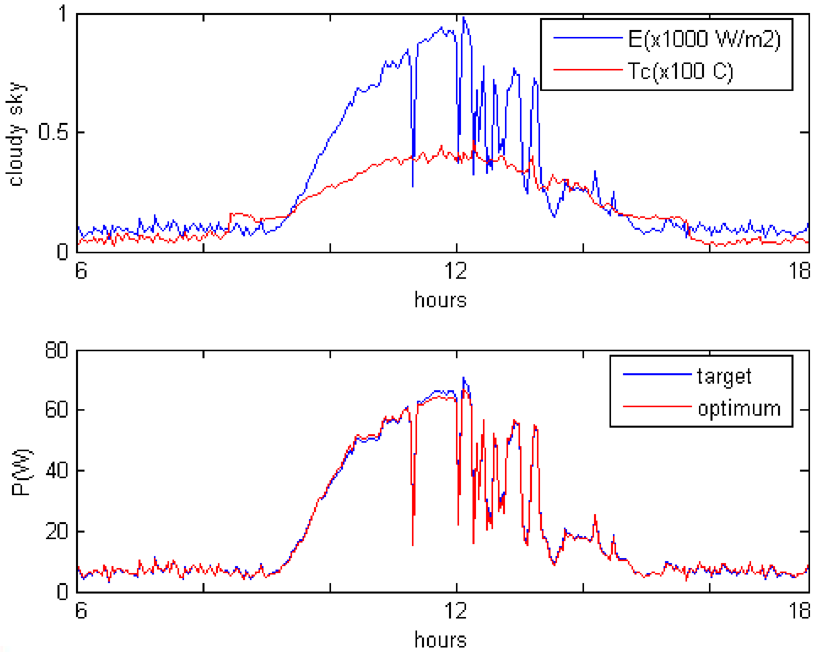


c.2 Validasi pada kondisi cuaca berawan

d. AstroPower AP-8225 (thin film Si)



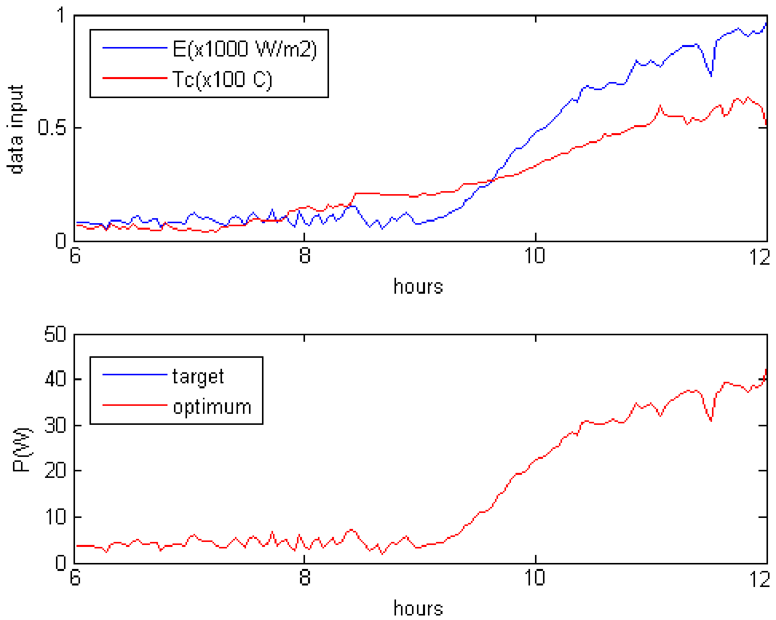
d.1 Validasi pada kondisi cuaca cerah



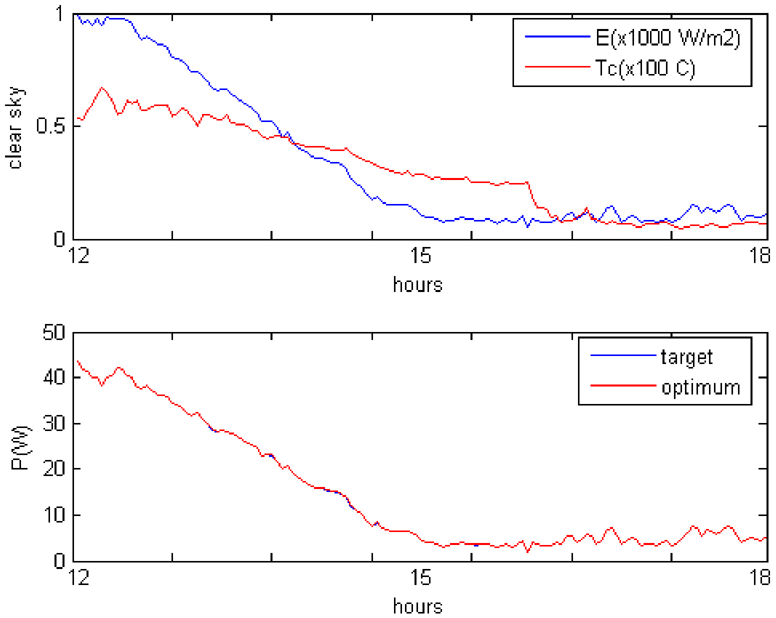
d.2 Validasi pada kondisi cuaca berawan

Lampiran 9. Hasil training dan validasi dengan metode ANFIS

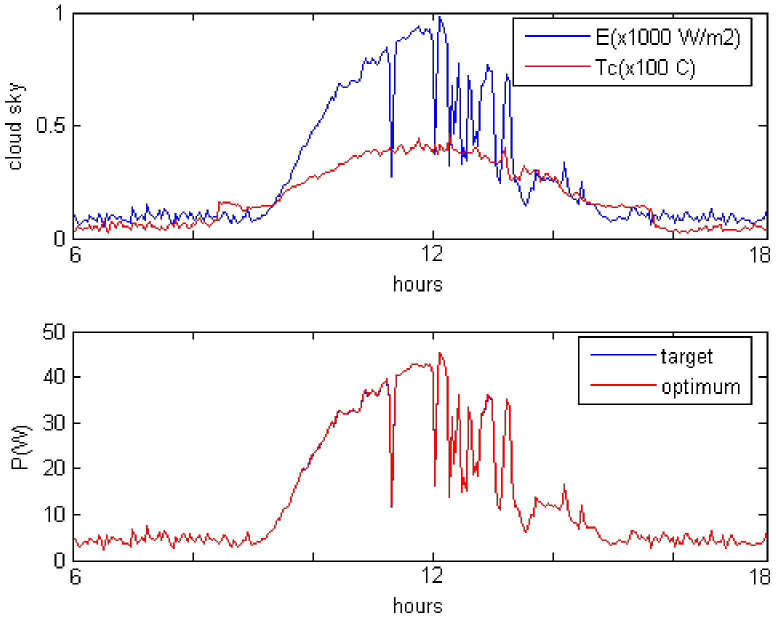
a. ASE-50-ATF/17 (EFG mc-Si)



a. Hasil proses training



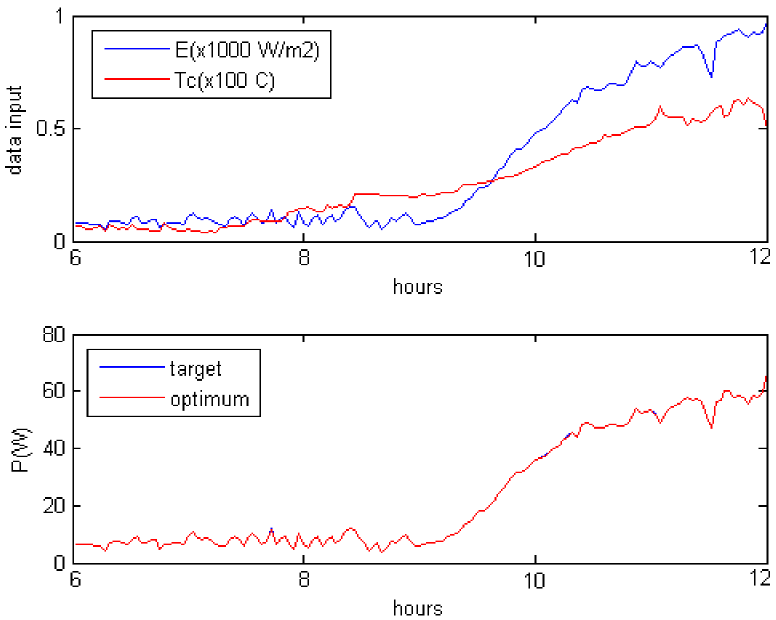
b.1 Kondisi cerah



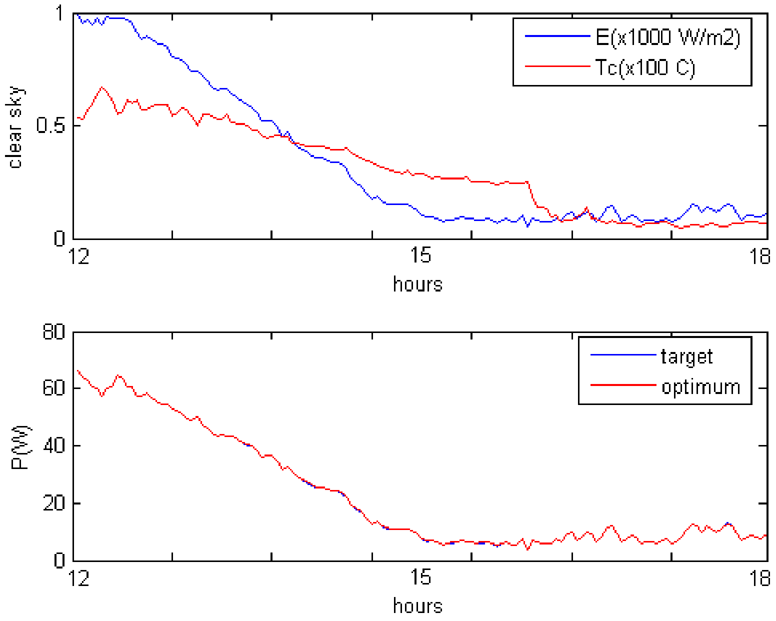
b.2 Kondisi berawan

b. Hasil validasi

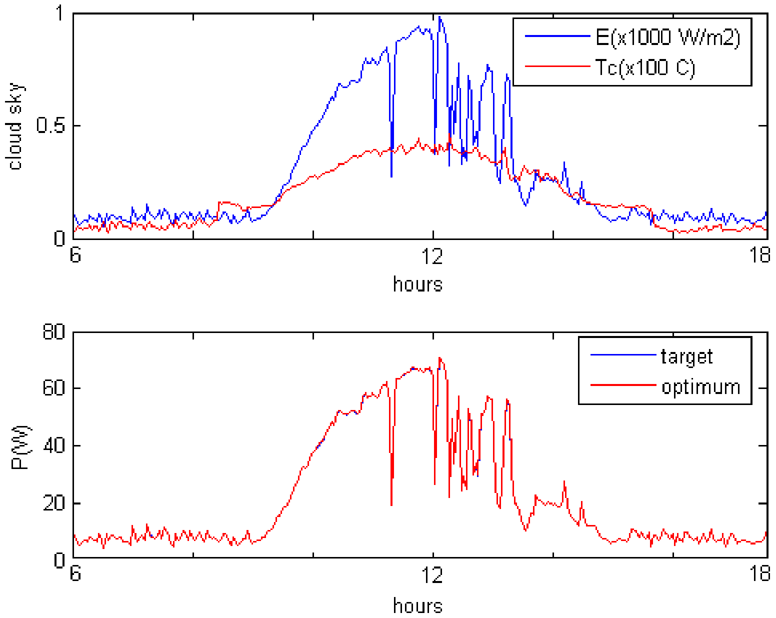
b. Kyocera KC-80 (wafer mc-Si)



a. Hasil proses training



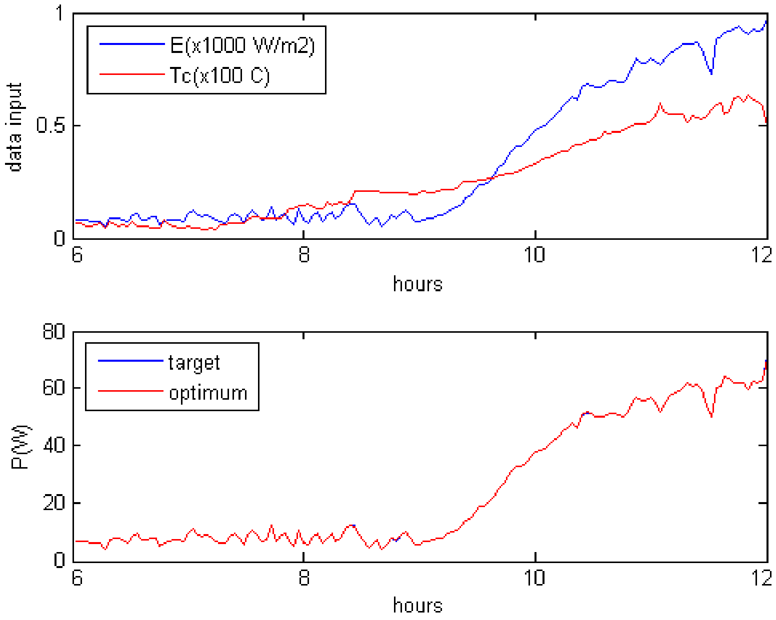
b.1 Kondisi cerah



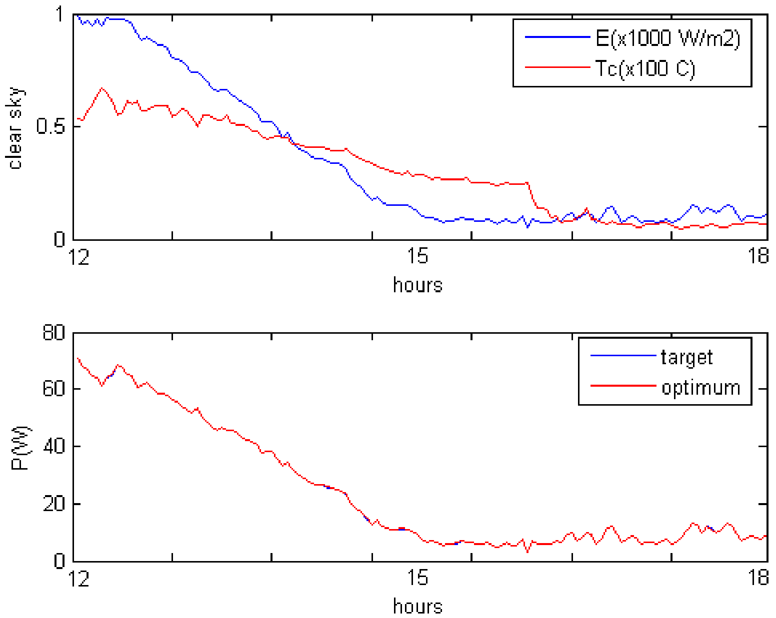
b.2 Kondisi berawan

b. Hasil validasi

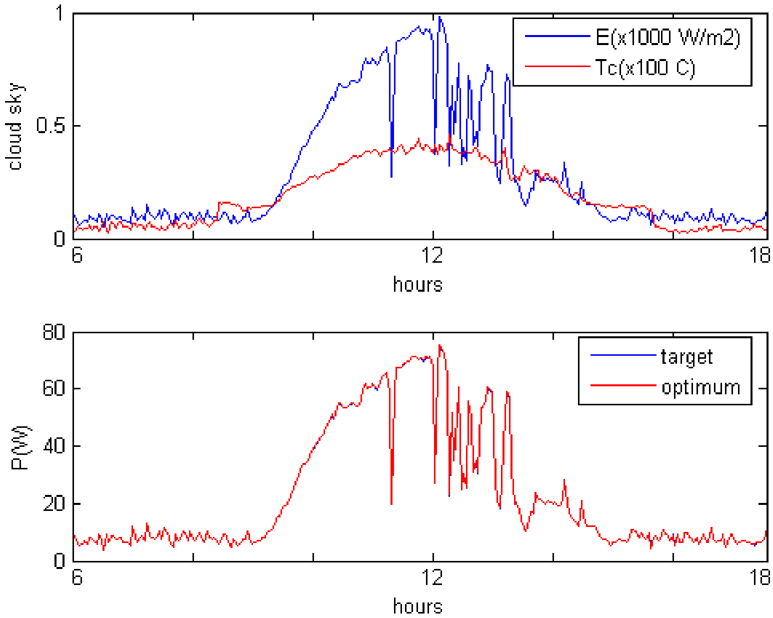
c. BP Solar BP-585 (c-Si)



a. Hasil proses training



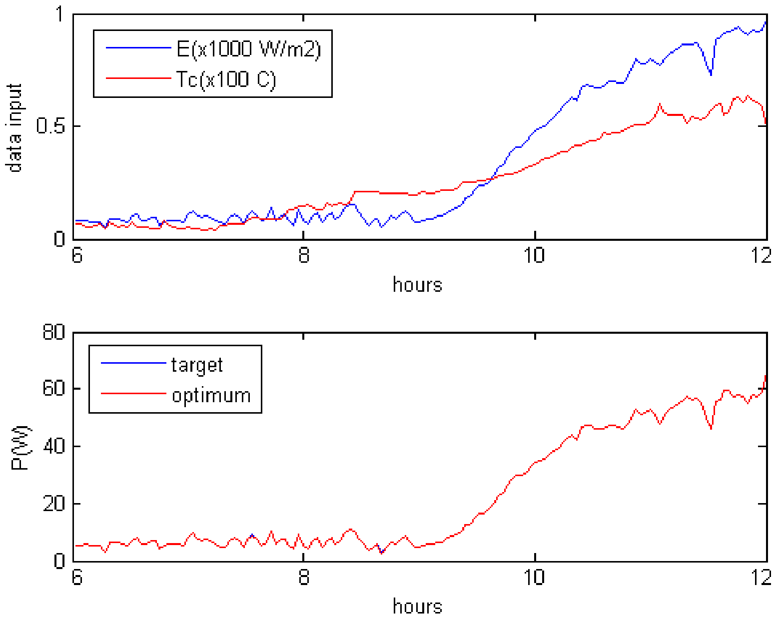
b.1 Kondisi cerah



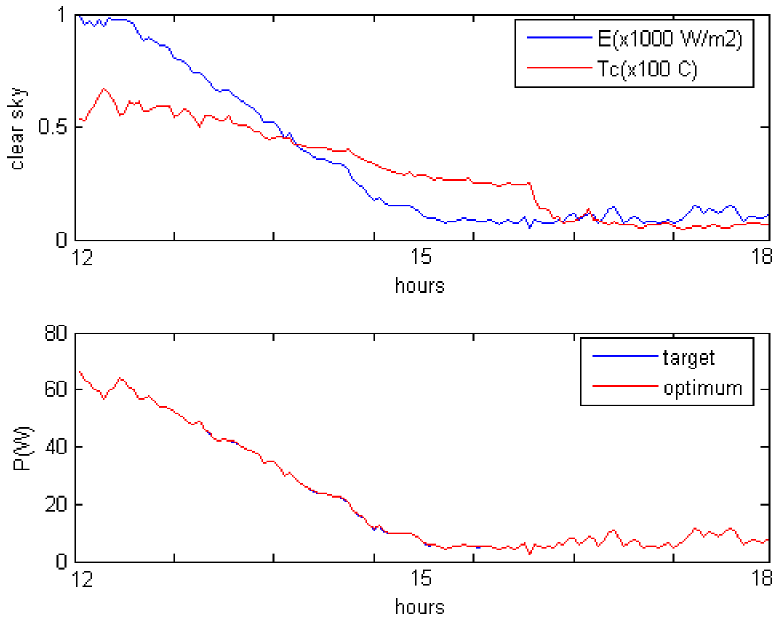
b.2 Kondisi berawan

b. Hasil validasi

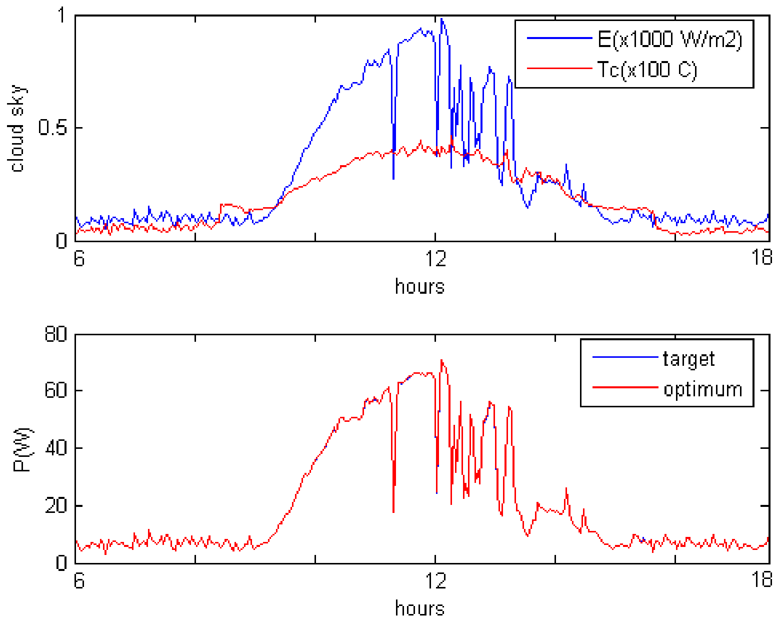
d. AstroPower AP-8225 (thin film Si)



a. Hasil proses training



b.1 Kondisi cerah



b.2 Kondisi berawan

b. Hasil validasi