

## Model 3197

# Analizator kvaliteta energije



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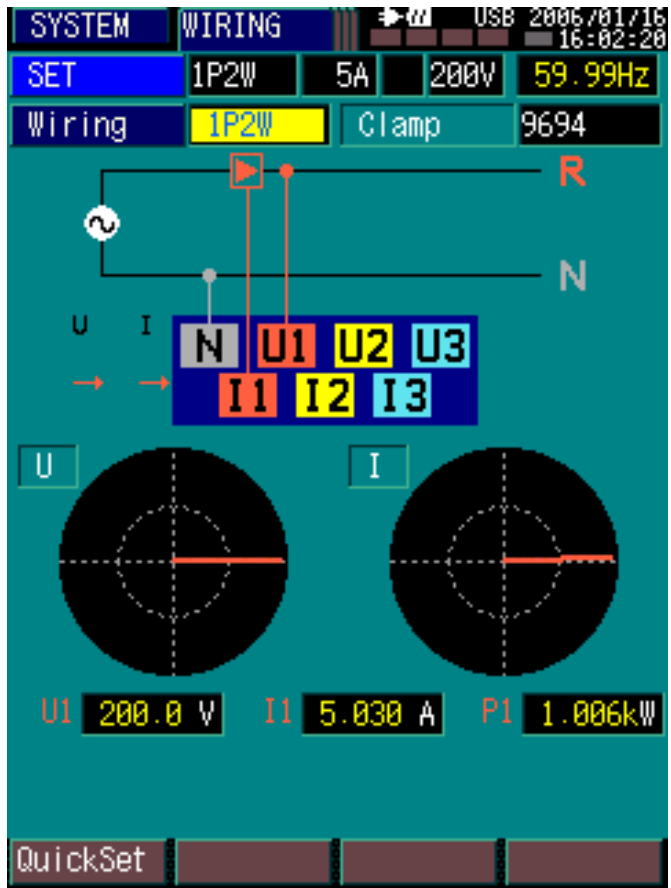
# Glavne karakteristike

- Provera povezivanja + Vektor provera
- QuickSet
- VIEW funkcija
- Osnovni kvalitet snage + energija merenje
- 4MB memorija (može se podeliti na 4x1MB)
- Udarne struje
- USB interfejs
- Dvojno napajanje

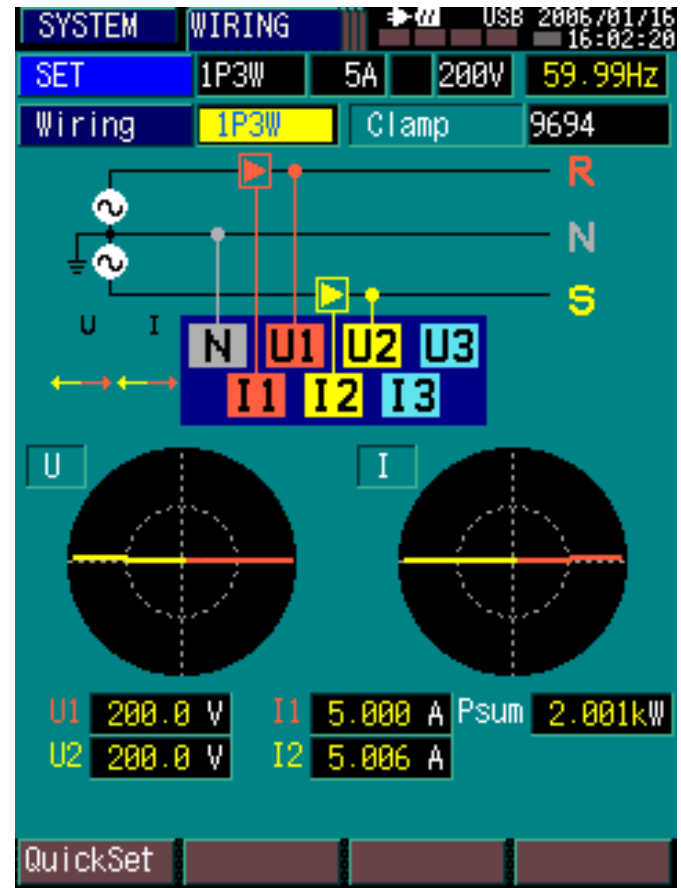


## Provera povezivanja + Vektor provera (1-faza)

### 1P2W

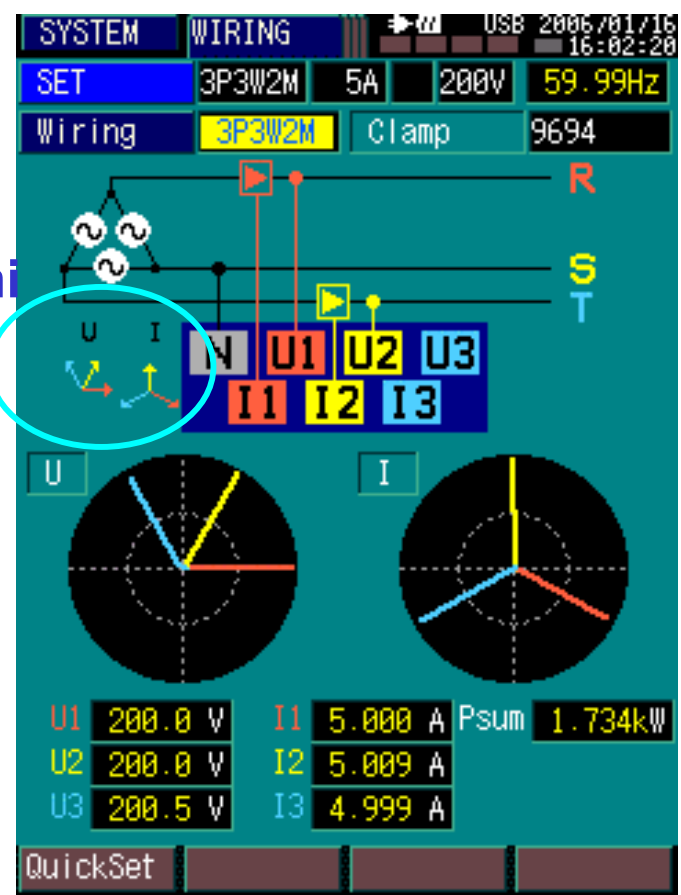


### 1P3W



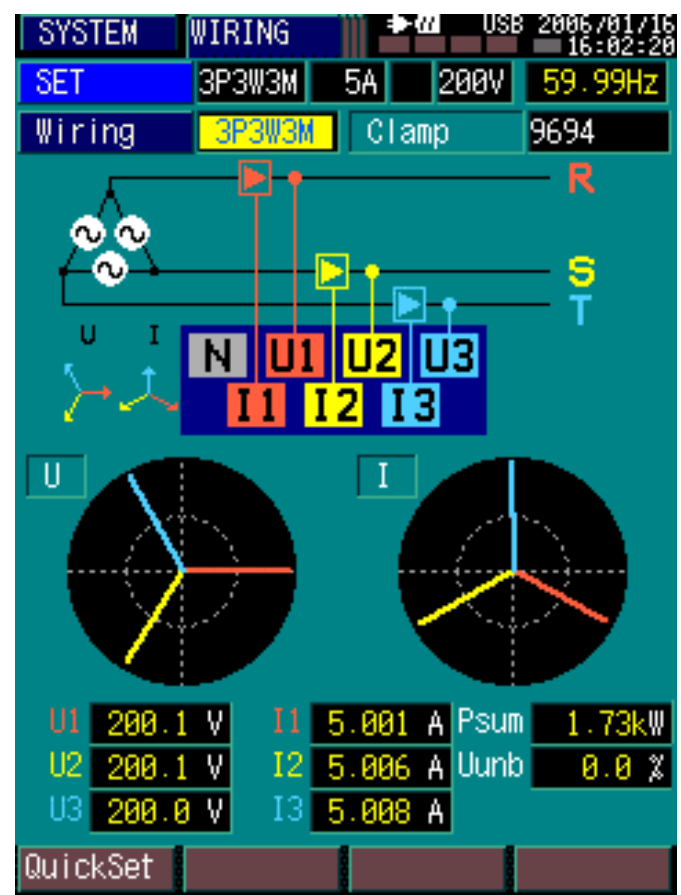
## Provera povezivanja + Vektor provera (3-faze 3-žice)

### 3P3W2M



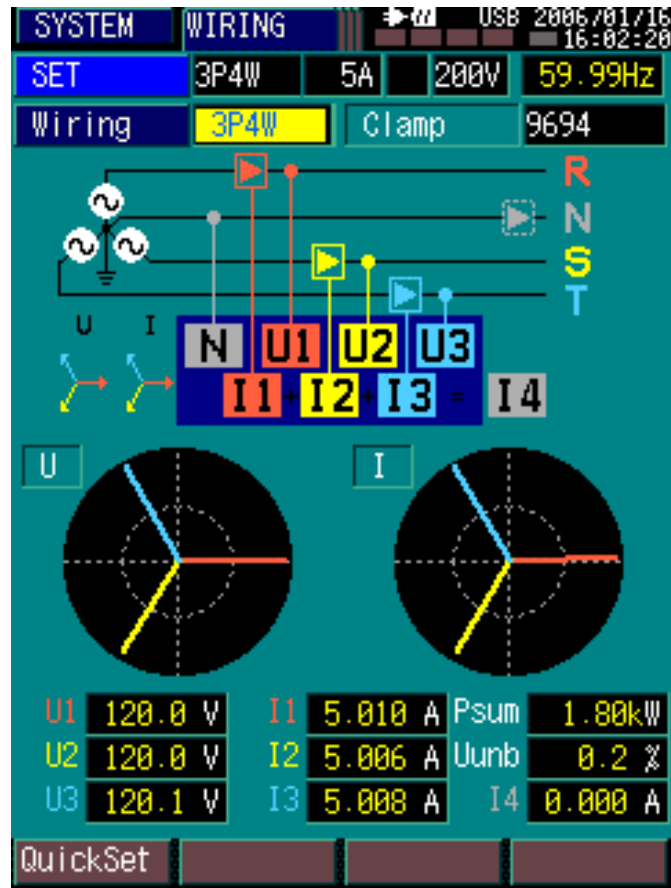
Ispravni vektori

### 3P3W3M

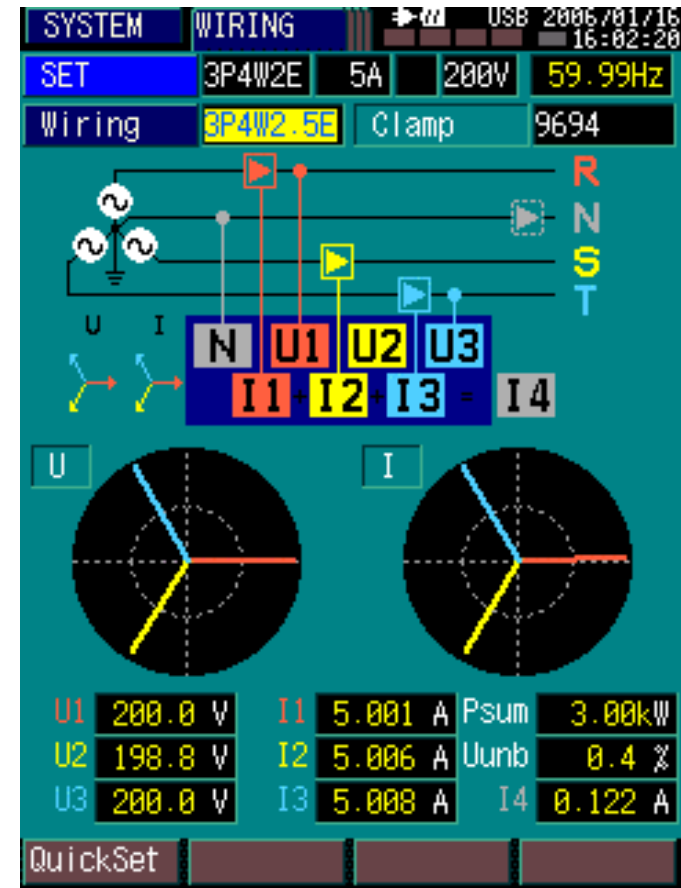


# Provera povezivanja + Vektor provera (3-faze 4-žice)

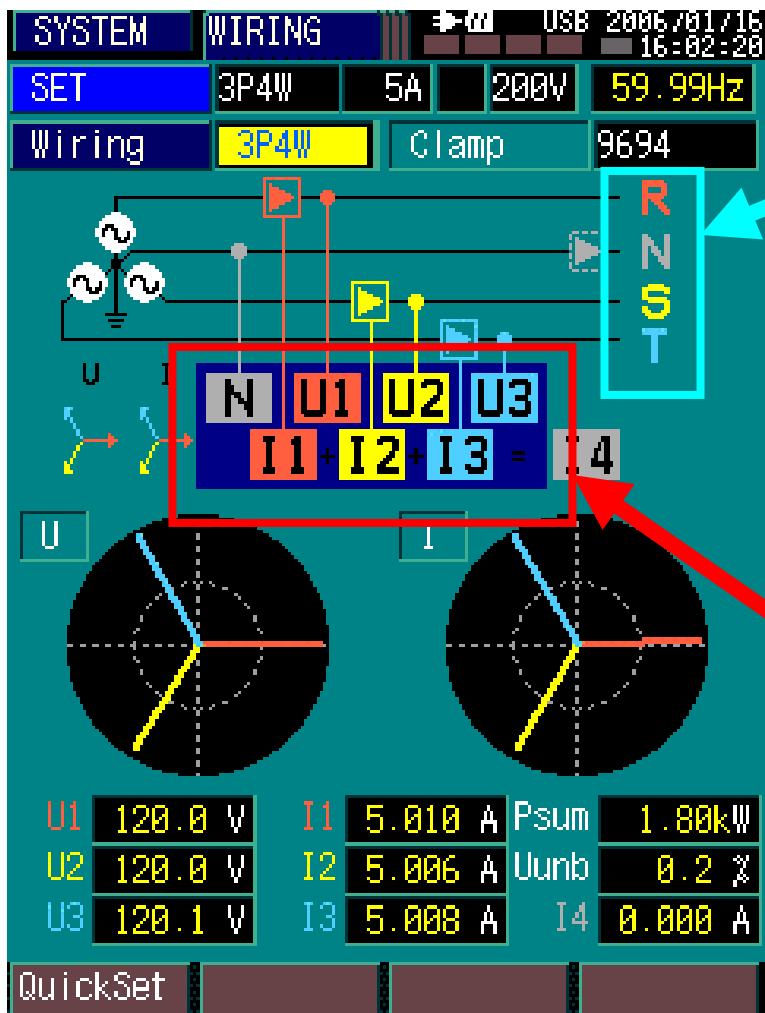
### 3P4W



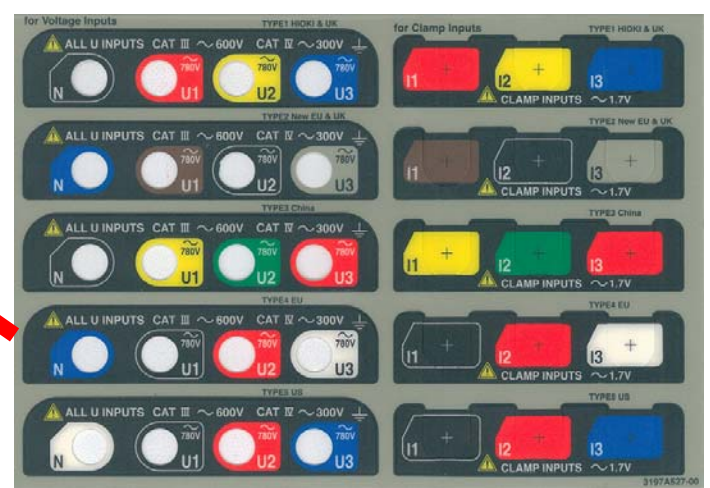
### 3P4W2.5E



## Dijagram povezivanja



R,S,T  
A,B,C  
L1,L2,L3  
U,V,W



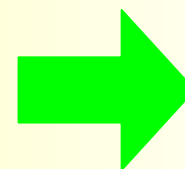
5 izbora boja da odgovaraju ulaznim terminalima

# QuickSet

- Samo 3 koraka do starta snimanja!

## Dijagram povezivanja ekran

- 1) Povezivanje i Klešta senzori
- 2) QuickSet



**3) START!!**

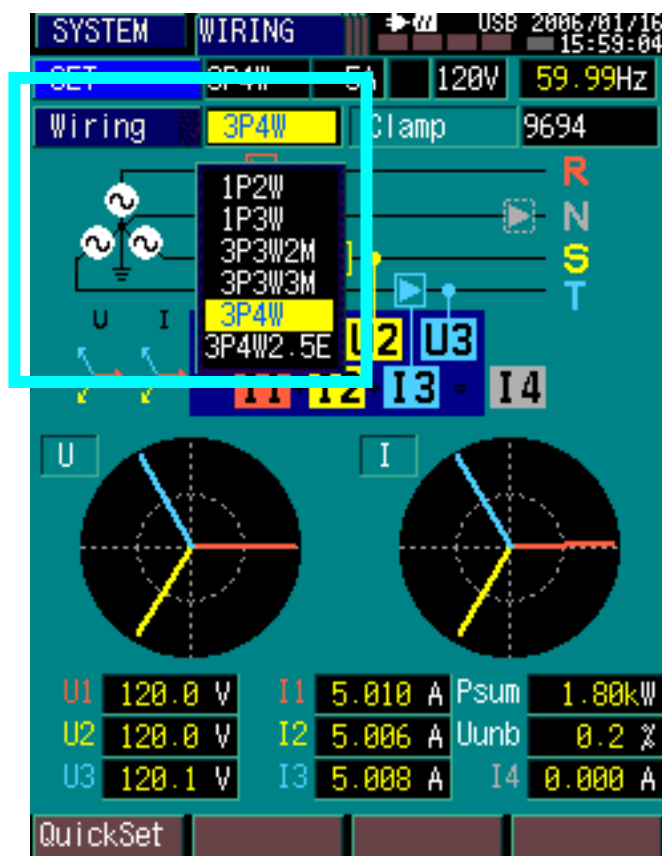
*Opcija: Strujni opseg (u SYSTEM ekranu)*

<Automatsko podešavanje>

Naponski opseg, Referentni napon, Frekvencija Interval, Detekcija događaja

## QuickSet - Korak 1

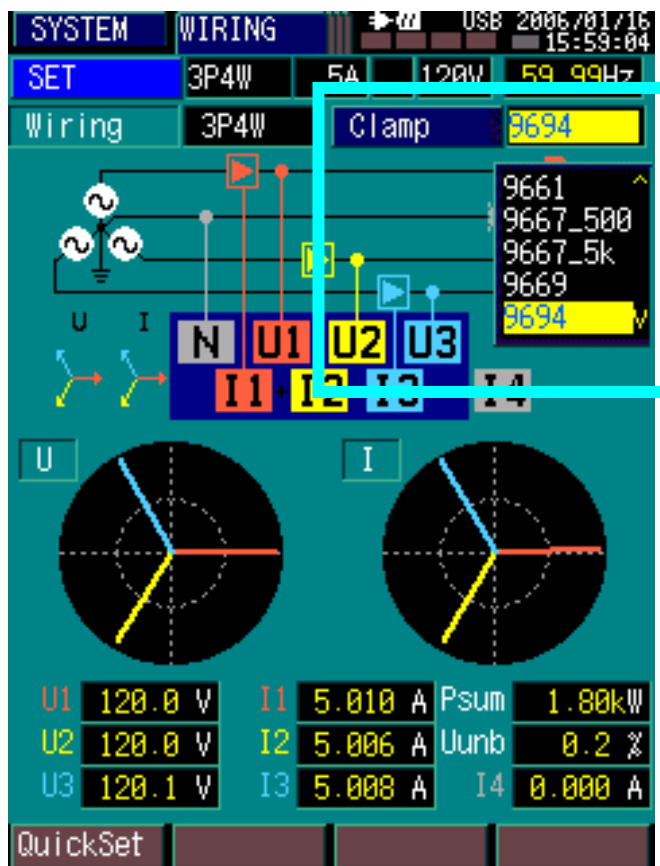
- Korak 1: Podešavanje povezivanja



Povežite naponske kablove i klešta senzore u skladu sa dijagramom.

## QuickSet - Korak 2

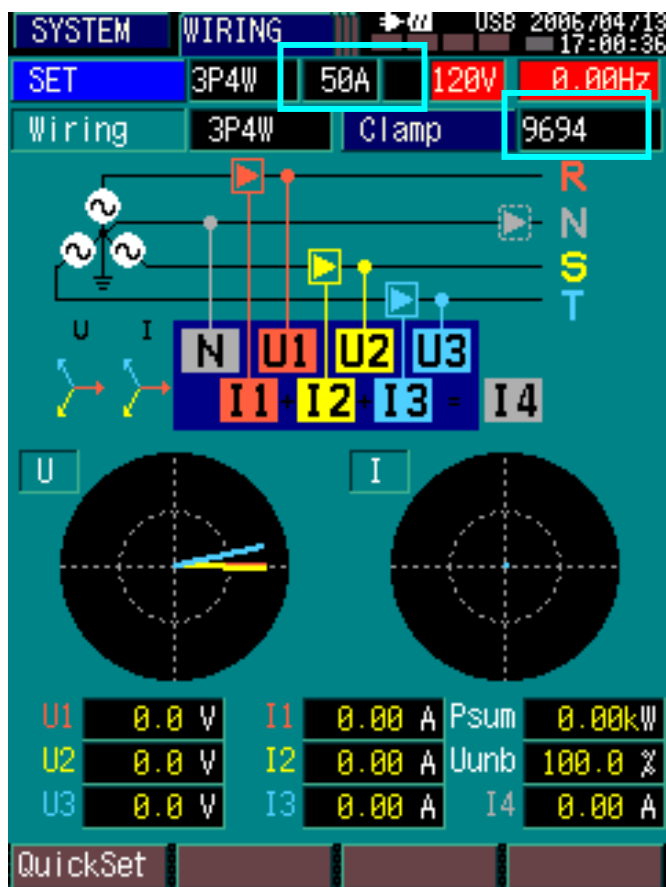
- Korak 2: Podesite klešta senzore i opseg



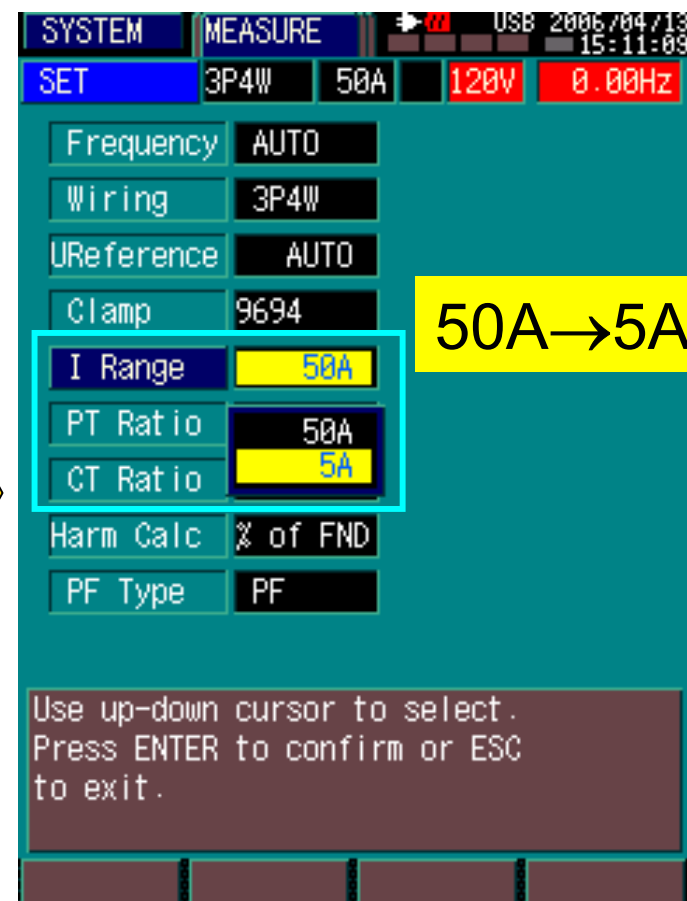
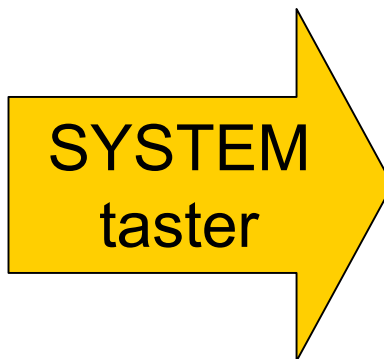
Potvrdite ispravno povezivanje ovde upotrebom DMM i vector prikaza.

## QuickSet (Opcija)

- Opcija: Strujni opseg

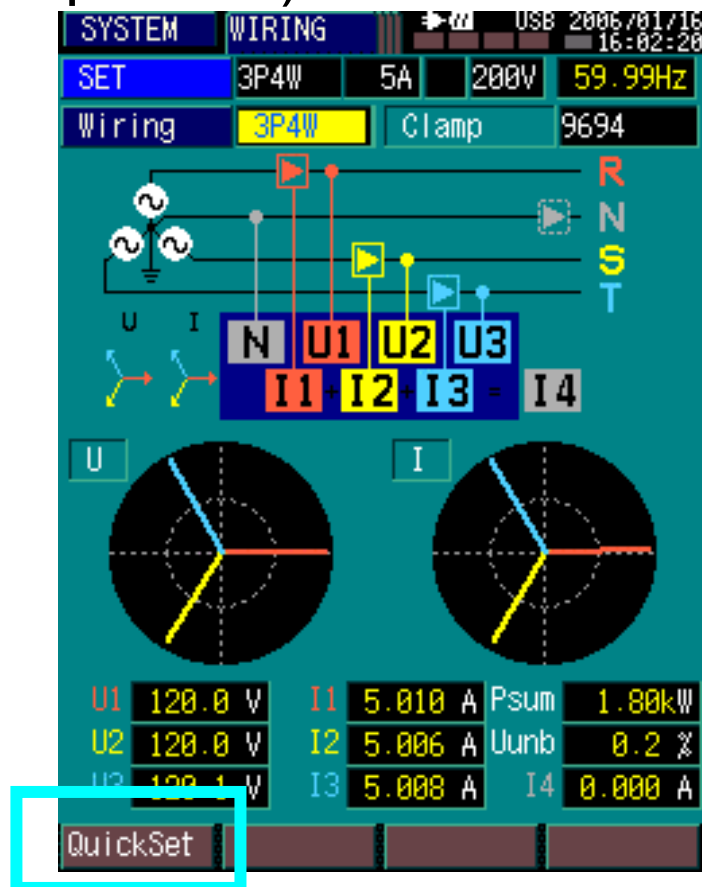


9694  
50A opseg



## QuickSet - Korak 3

- Korak 3: Pritisnite F1 taster (zatim ENTER taster za potvrdu)



Sve je spremno za start snimanja

# QuickSet - START

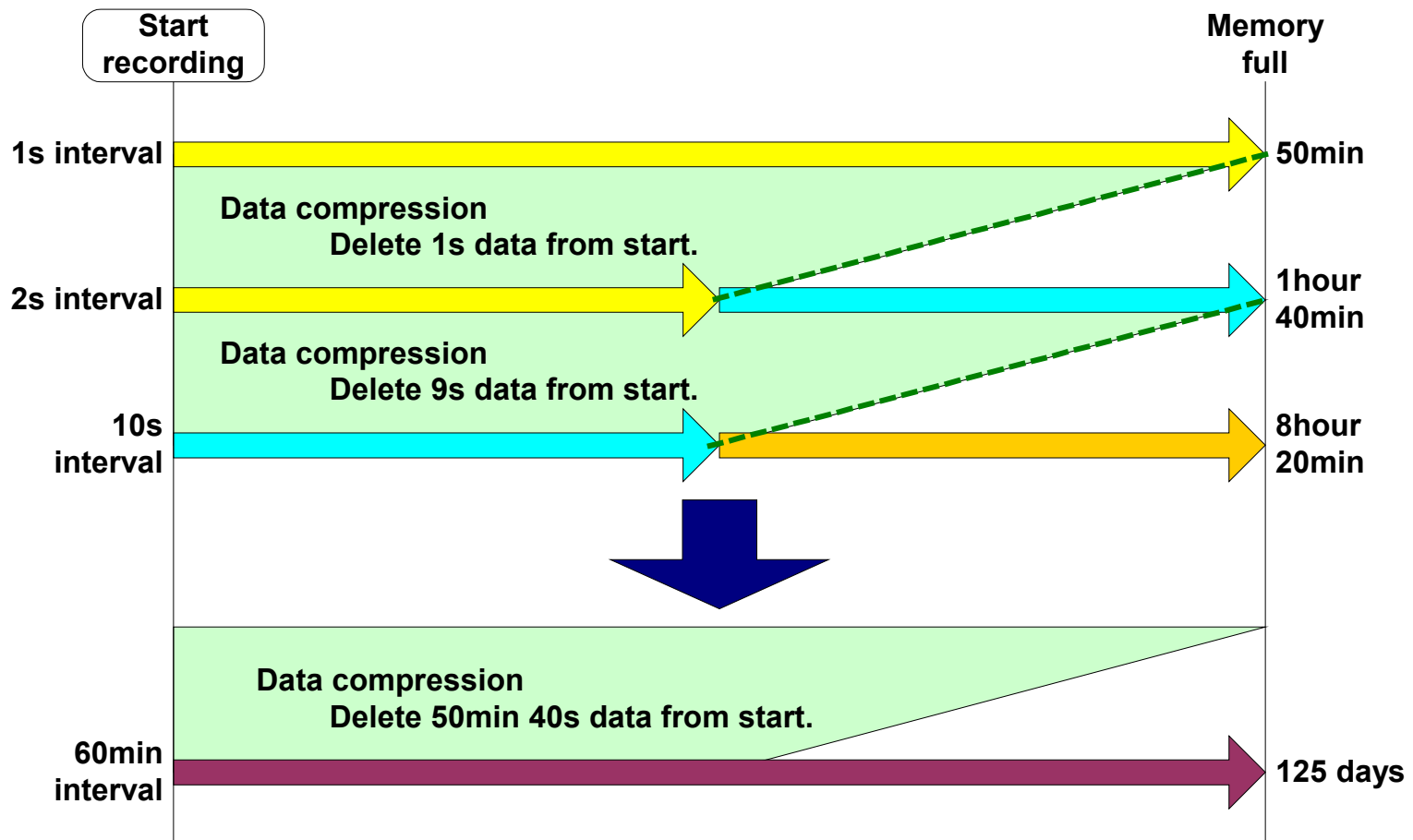
- START: Pritisnite START taster

- Naponski opseg, Referentni napon, Frekvencija
- Interval
  - Počnite od 1s intervala
  - Automatska kompresija
- Detekcija događaja
  - Porast napona: 110%
  - Pad napona: 90%
  - Prekid: 10%
  - Prelazne pojave: ON

**Automatsko podešavanje!!**

# Automatski Interval -1

- Automatska promena intervala





# Automatski Interval -2

- Interval i period snimanja

Interval	Period snimanja	
	Bez podele memorije	Podela memorije (4)
1s	50min.	12min. 30s
2s	1sat 40min.	25min.
10s	8sati 20min.	2sata 5min.
30s	1dan 1sat	6sati 15min.
1min	2dana 2sata	12sati 30min.
5min	10dana 10sati	2dana 14sati 30min.
15min	31dan 6sati	7dana 19sati 30min.
30min	62dana 12sati	15dana 15sati
60min	125dana	31dana 6sati

## Detaljna podešavanja

**MEASURE** | SYSTEM | USB 2006/02/21 | 05:54:08

SET 3P4W 500A 120V 59.99Hz

Frequency	AUTO
Wiring	3P4W
UReference	120V
Clamp	9661
I Range	500A
PT Ratio	1
CT Ratio	1
Harm Calc	LEVEL
PF Type	PF

Press ENTER and select the measure. Press ENTER again or ESC to exit. Measurable automatically displayed.

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**REC&EVENT** | SYSTEM | USB 2006/02/21 | 05:55:17

SET 3P4W 500A 120V 60.02Hz

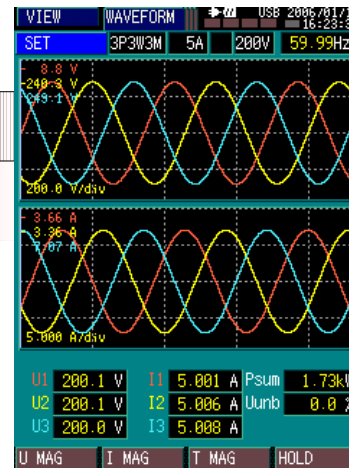
Partition	ON		
Interval	AUTO	Demand	30min
Time Start	OFF		
Start Time	2006 Y 1 M 1 D 0 h 0 m		
Stop Time	2006 Y 1 M 1 D 0 h 0 m		
Timer Evt	OFF	Inrush	3.0A
U Transient	ON		
Urms SWELL	110 %	=	110.0 V
Urms DIP	90 %	=	90.0 V
Interruption	10 %	=	10.0 V

Press ENTER and select ON to partition memory into 4 divisions, or OFF for no partitions.

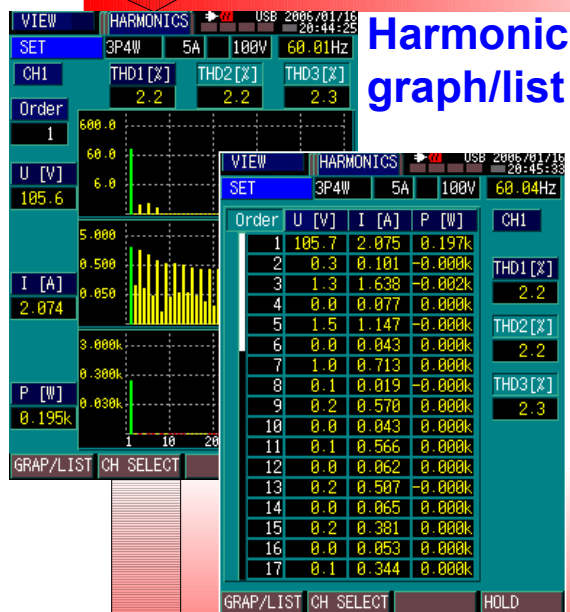
## Dopunske mogućnosti!

- PT/CT odnos
- Računski metod
- Interval
- Granične vrednosti događaja
- Udarna struja događaj
- Tajmer/Sat
- Podela memorije

## VIEW funkcija

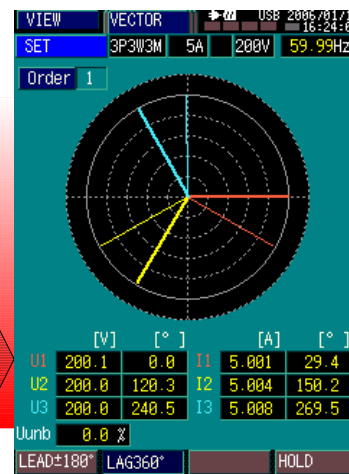


Waveform

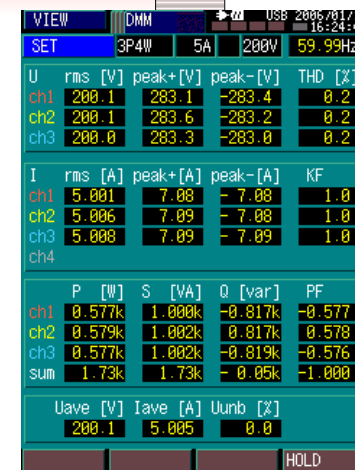


Harmonic graph/list

VIEW



Vector



DMM

NAPOMENA:

Harmonici nisu dostupni

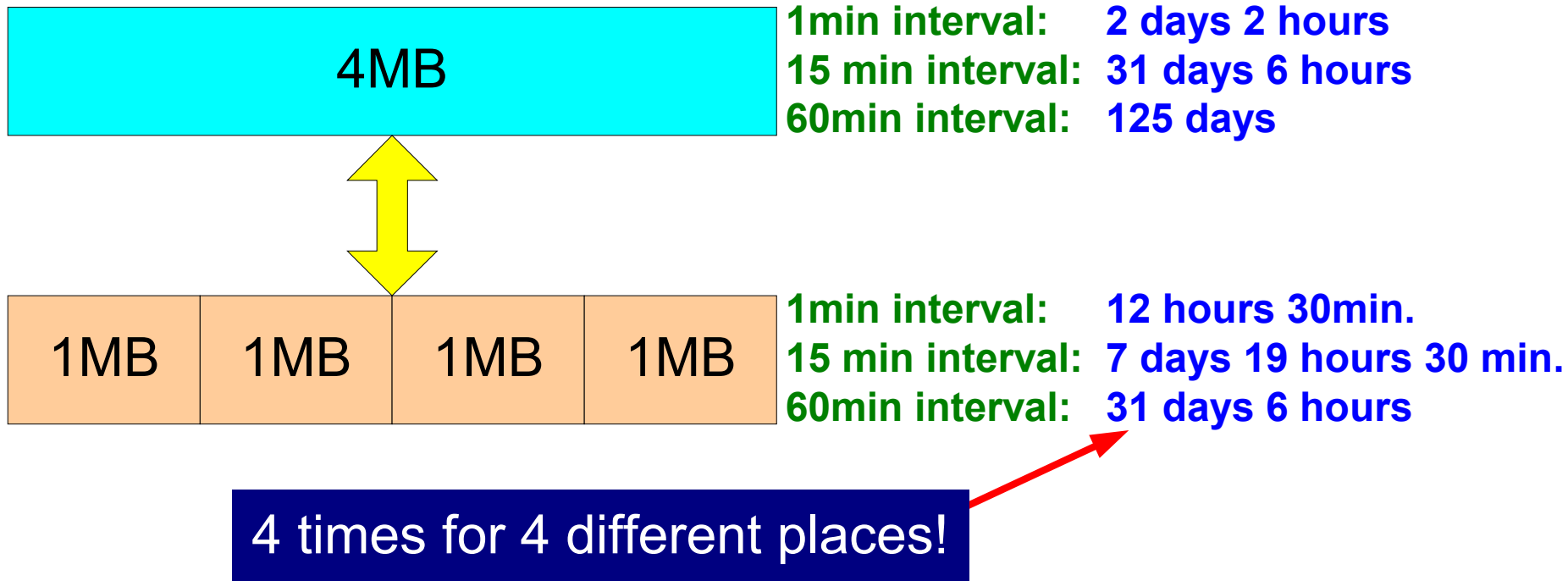
# Osnovni kvalitet snage + Energija merenje

- Događaj kvaliteta snage
  - Porast napona, Pad napona, Prekid, Tranzijentni prekonapon
  - Udarna struja
- TIME PLOT – Vremenski nacrt
  - Napon, Struja, Frekvencija, Snaga (aktivna, reaktivna, aparentna), Faktor snage, Fazni ugao
  - Energija (aktivna, reaktivna), Demand - potražnja
  - THD (napon, struja)
  - Fluktuacije napona (porast/pad)

**Simultano merenje i  
snimanje!**

# 4MB memorija (može se koristiti kao 4x1MB)

- Ipodaci energije i događaja se snimaju u ugrađenu memoriju.



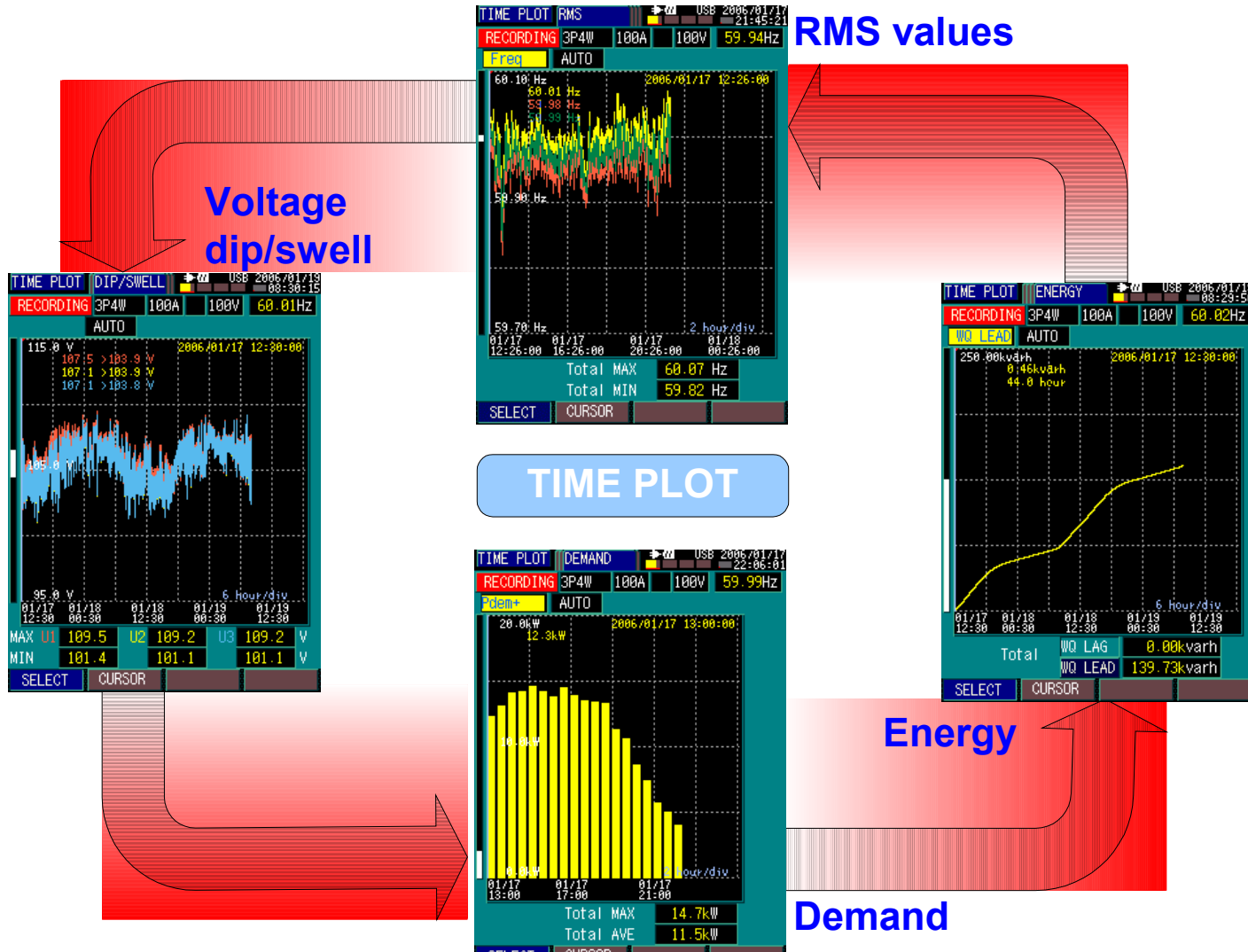


## TIME PLOT -1

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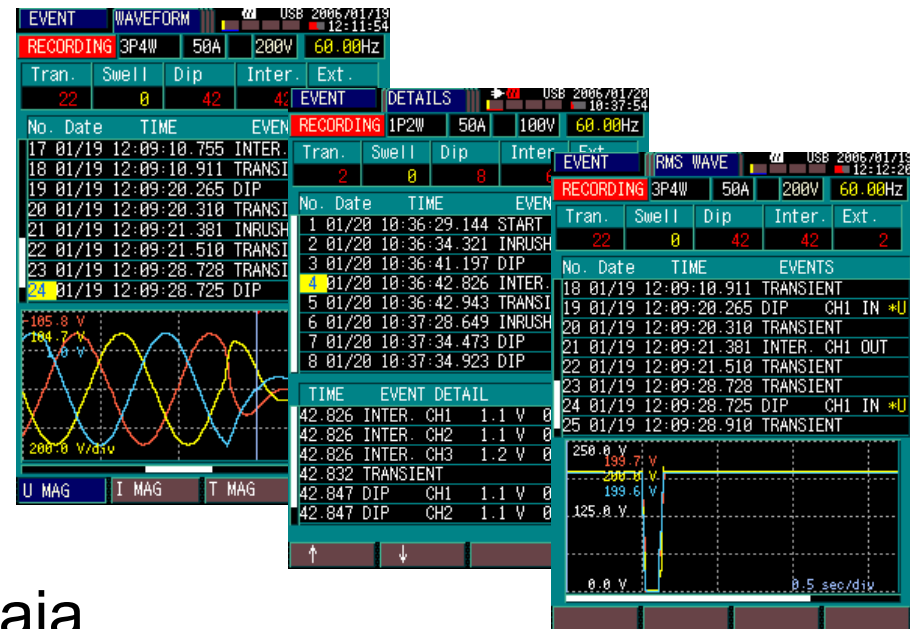
- Stavke merjenja
  - RMS vrednosti (Napon, Struja, Snaga)
  - Frekvencija
  - Faktor snage, Fazni ugao
  - THD (Napon, Struja)
  - Energija (Wh, varh)
  - Demand (W, var)
  - Fluktuacije napona (porast/pad)

## TIME PLOT -2



# Snimanje događaja -1

- Stavke događaja
  - Porast napona, Pad napona, Prekid, Tranzijentni prekonapon
  - Udarna struja



- Stavke prikaza
  - Lista događaja
  - +
  - Detalji događaja
  - Talasni oblici događaja
  - Fluktuacijenapona ili udarne struje

## Snimanje događaja -2

The diagram illustrates the navigation flow between four main screens of the HIOKI event recorder:

- Waveform**: Shows a list of events and a corresponding waveform graph.
- Details**: Provides a detailed list of events and a specific event detail view.
- Inrush**: Displays a list of inrush events and a corresponding inrush waveform graph.
- Voltage dip/swell**: Shows a list of voltage dip/swell events and a corresponding waveform graph.

Navigation arrows indicate the following flow:

- From **Waveform** to **Details**.
- From **Waveform** to **Inrush**.
- From **Details** to **Voltage dip/swell**.
- From **Inrush** to **Voltage dip/swell**.

**EVENT**

**Waveform**

Tran.	Swell	Dip	Inter.	Ext.
22	0	42	42	2

No.	Date	TIME	EVENTS
17	01/19	12:09:10.755	INTER. CH1 OUT
18	01/19	12:09:10.911	TRANSIENT
19	01/19	12:09:20.265	DIP CH1 IN *U
20	01/19	12:09:20.310	TRANSIENT
21	01/19	12:09:21.381	INTRUSH *I
22	01/19	12:09:21.510	TRANSIENT
23	01/19	12:09:28.728	TRANSIENT
24	01/19	12:09:28.725	DIP CH1 IN *U

**Details**

Tran.	Swell	Dip	Inter.	Ext.
6	0	12	12	2

No.	Date	TIME	EVENTS
1	01/19	17:04:35.013	START
2	01/19	17:04:47.114	INTRUSH *I
3	01/19	19:21:28.135	DIP CH1 IN *U
4	01/19	19:21:28.294	TRANSIENT
5	01/19	19:21:28.971	INTER. CH1 OUT
6	01/19	19:21:29.093	TRANSIENT
7	01/19	20:08:03.548	DIP CH1 IN *U
8	01/19	20:08:03.650	TRANSIENT

TIME	EVENT DETAIL
28.135	DIP CH1 IN
28.135	DIP CH2 IN
28.135	DIP CH3 IN
28.137	TRANSIENT
28.160	INTER. CH1 IN
28.160	INTER. CH2 IN

**Inrush**

Tran.	Swell	Dip	Inter.	Ext.
0	0	0	0	15

No.	Date	TIME	EVENTS
1	01/19	11:47:46.025	START
2	01/19	11:47:50.679	INTRUSH *I
3	01/19	11:47:53.494	INTRUSH
4	01/19	11:47:58.608	INTRUSH
5	01/19	11:47:58.642	INTRUSH
6	01/19	11:47:59.275	INTRUSH
7	01/19	11:48:02.507	INTRUSH
8	01/19	11:48:03.174	INTRUSH

**Voltage dip/swell**

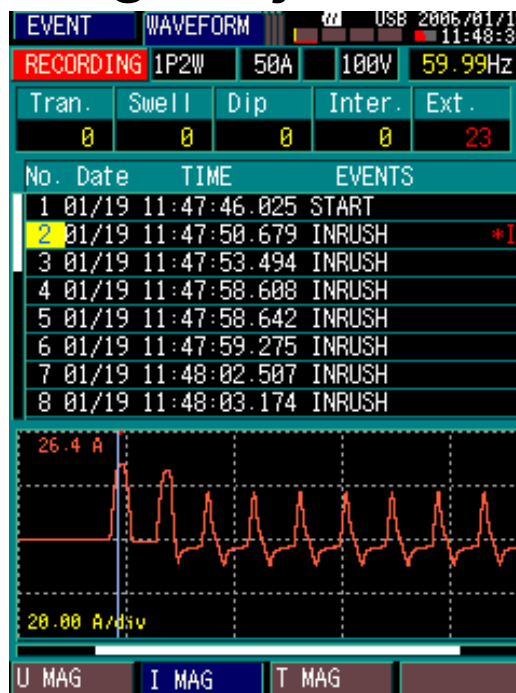
Tran.	Swell	Dip	Inter.	Ext.
22	0	42	42	2

No.	Date	TIME	EVENTS
18	01/19	12:09:10.911	TRANSIENT
19	01/19	12:09:20.265	DIP CH1 IN *U
20	01/19	12:09:20.310	TRANSIENT
21	01/19	12:09:21.381	INTER. CH1 OUT
22	01/19	12:09:21.510	TRANSIENT
23	01/19	12:09:28.728	TRANSIENT
24	01/19	12:09:28.725	DIP CH1 IN *U
25	01/19	12:09:28.910	TRANSIENT

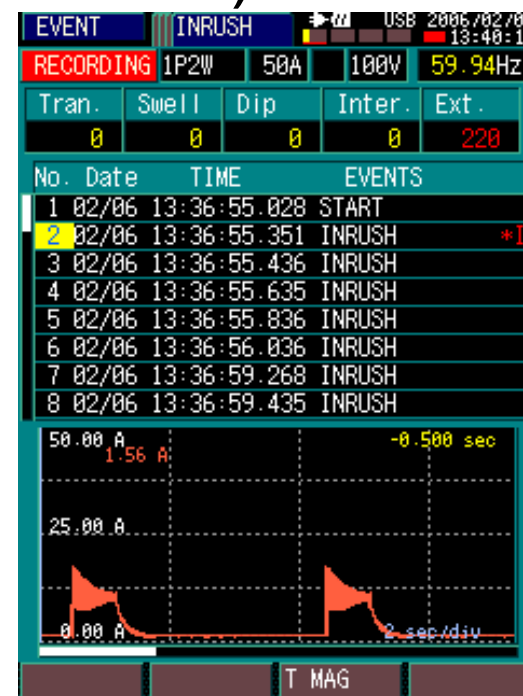
## Udarna struja

- 30s grafik fluktuacije efektivne struje (proračun pomeranja za pola ciklusa)
- Talasni oblik događaja

Za procenu  
startne struje  
motora



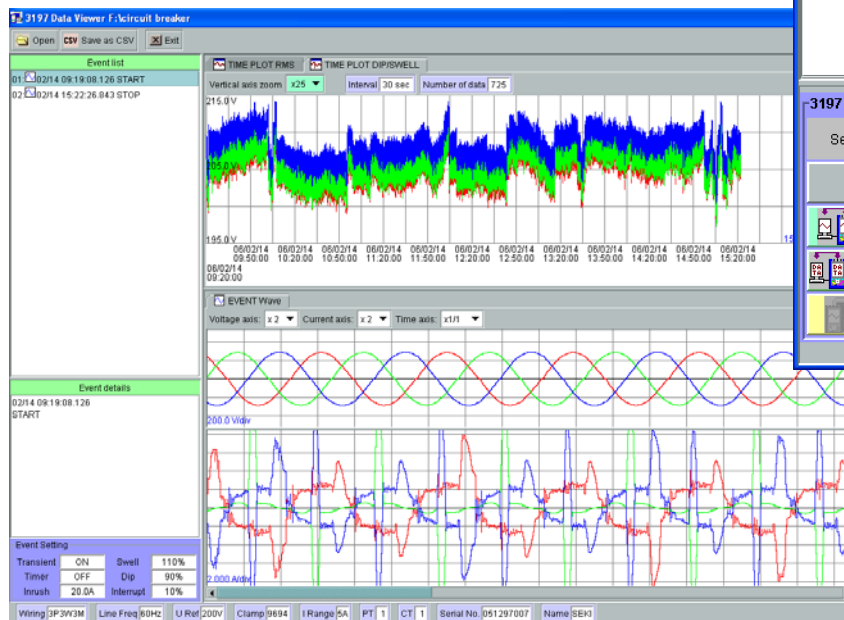
Talasni oblik



RMS fluktuacije

## USB interfejs

- 3197Communicator
- 3197DataViewer
  - Dodatak u sastavu kompleta



The screenshot shows the '3197 Communicator' interface, which provides a comprehensive overview of the device's status and measurement data:

- System Information:**
  - SYSTEM: WIRING
  - SET: 3P4W, 5A, 120V, 59.99Hz
  - Wiring: 3P3W, Clamp: 9694
- Measurement Data:**

U1	120.0 V	I1	5.010 A	Psum	1.00kW
U2	120.0 V	I2	5.006 A	Uunb	0.2 %
U3	120.1 V	I3	5.008 A	I4	0.000 A
- 3197 Information Table:**

Serial Number	051297002
Name	
Screen copy download	3
Measurement data download	0
Open with Viewer	
- Control Panel:** Includes function keys (F1-F4), START/STOP, DATA RESET, HARD COPY, SYSTEM, VIEW, TIMEPLOT, and EVENT buttons.

## Communicator

Lista povezanih  
3197

Povezivanje  
više 3197  
putem USB  
huba.

Informacije  
izabranog 3197

Connect 3197 List

051297002
051297004

3197 Information

Serial Number	051297002
Name	
Screen copy download	3
Measurement data download	0
Open with Viewer	

Screen

Refresh screen Save as BMP Enlarge Auto refresh

SYSTEM WIRING USB 2006/01/16 15:59:04

SET 3P4W 5A 120V 59.99Hz

Wiring 3P4W Clamp 9694

U I

U1 120.0 V I1 5.010 A Psum 1.80kW

U2 120.0 V I2 5.006 A Uunb 0.2 %

U3 120.1 V I3 5.008 A I4 0.000 A

QuickSet

F1 F2 F3 F4

START/STOP SYSTEM

DATA RESET ENTER VIEW

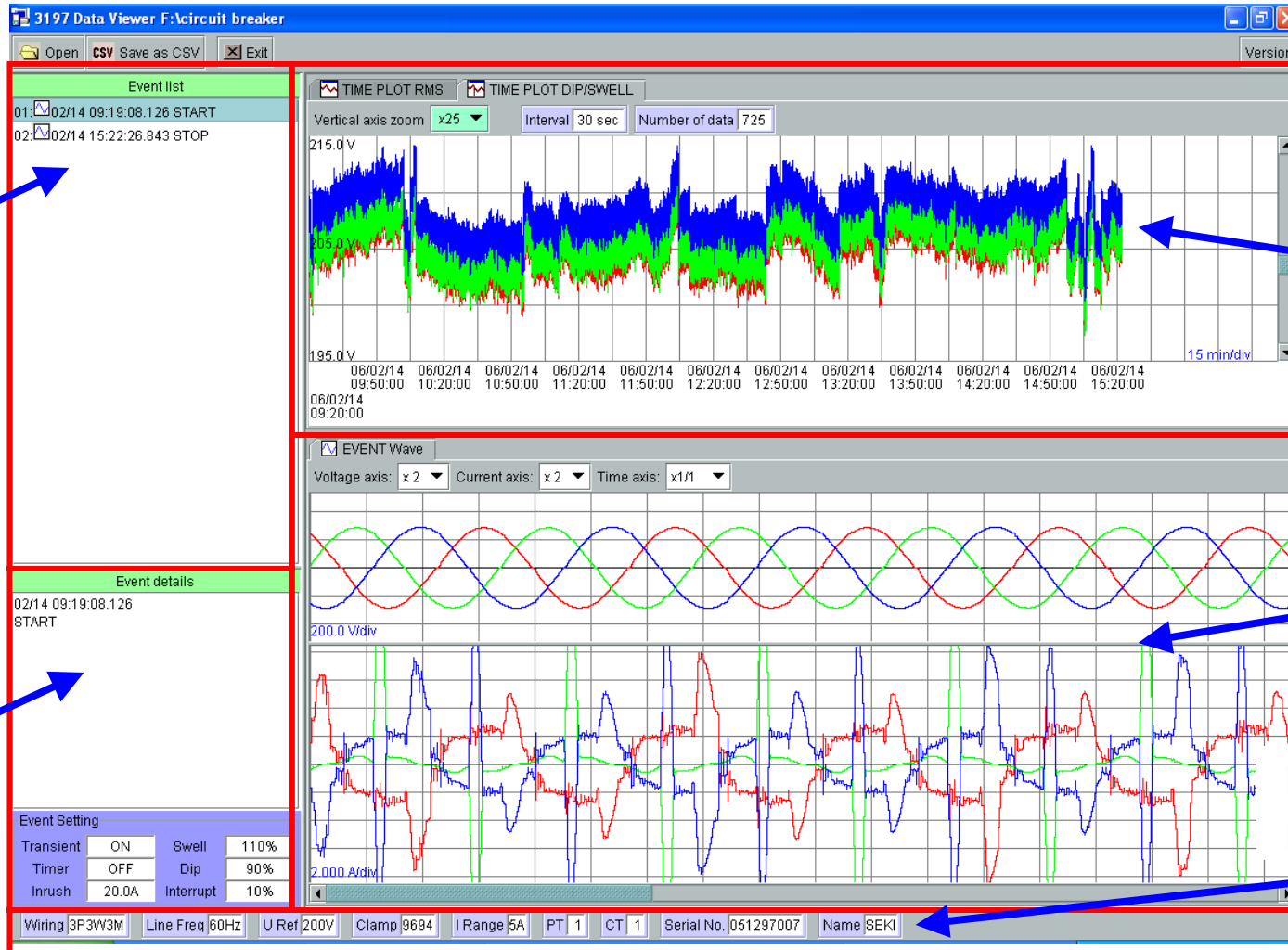
HARD COPY TIMEPLOT

ESC/on EVENT

Isti ekran

Isti tasteri u  
istim funkcijama

## Data Viewer



Lista događaja

TIME PLOT grafik

Talasni oblik događaja

Detalji događaja

Informacije o podešavanju

## Dvojni izvor napajanja

- AC adapter
  - Dug period snimanja
- Ugrađeno baterijsko pakovanje (6 sati kontinualnog snimanja)
  - Kratak period snimanja
  - Brza provera

Baterijsko pakovanje se može proveriti i kad je uključen i kad je isključen 3197.



## Dodaci i opcije

### ■ Dodaci

- Naponski ulazni kablovi, AC adapter, USB kabl, torba za nošenje
- PC softver (preuzimanje, pregled, daljinska kontrola)

### ■ Opcije

#### ■ Klešta senzori

- 9694 (5A), 9660 (100A), 9661 (500A), 9669 (1000A)
- 9667 (500/5000A fleksibilna)
- 9657-10, 9675 (struje curenja)
- 9695-02 (50A), 9695-03 (100A)





## Metod proračuna

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- Uzorkovanje: 10.24kHz fiksirano
  
- TIME PLOT
  - Svaki 200ms (50Hz: 12 ciklusa, 60Hz: 10 ciklusa)
  - MAX/MIN/AVE snimanje u svakom intervalu
  
- Događaj
  - Pad, Porast, Prekid: Pomeranje pola ciklusa
  - Tranzijenti: 10.24kHz
  - Udarne struje: Pomeranje pola ciklusa

## Rezime

- Jednostavan za upotrebu (QuickSet)
- Prenosan
- Precizan
- Osnovni PQA + Energija snimanje
- Udarne struje

**Izuzetan kvalitet za nisku cenu!**



# Zahvaljujemo vam na pažnji!

