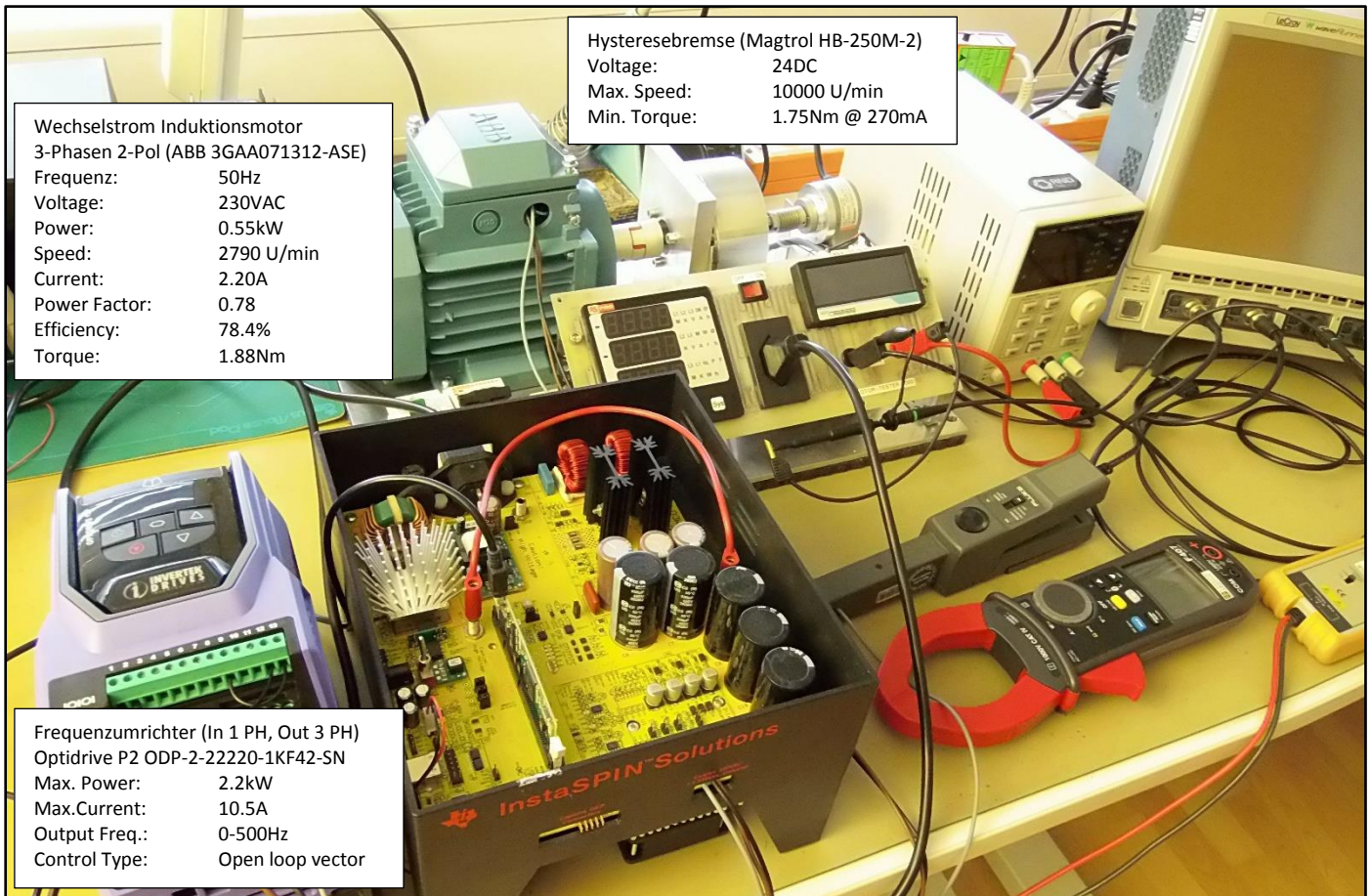


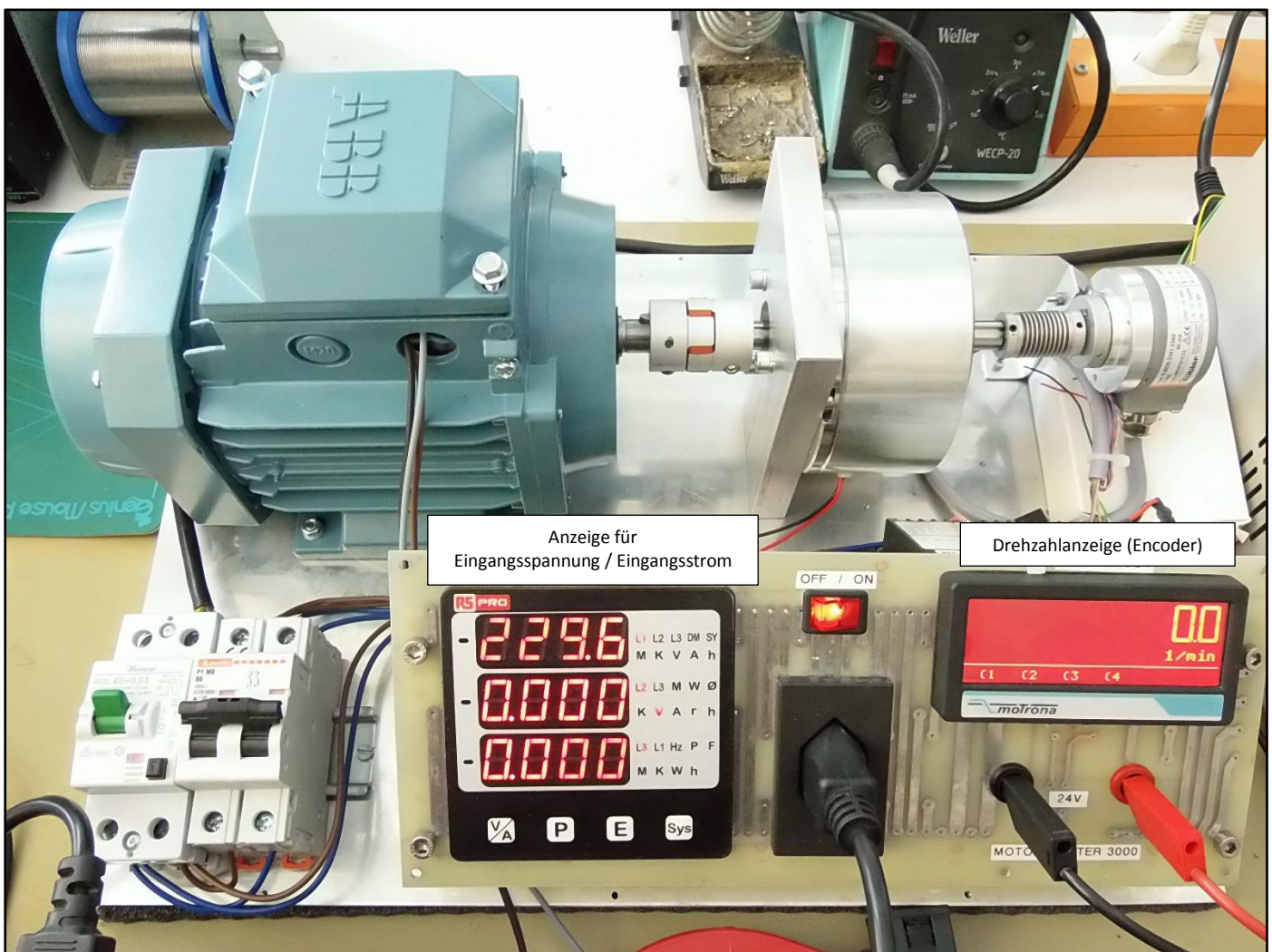
Motorprüfstand



Hysteresebremse (Magtrol HB-250M-2)
 Voltage: 24DC
 Max. Speed: 10000 U/min
 Min. Torque: 1.75Nm @ 270mA

Wechselstrom Induktionsmotor
 3-Phasen 2-Pol (ABB 3GAA071312-ASE)
 Frequenz: 50Hz
 Voltage: 230VAC
 Power: 0.55kW
 Speed: 2790 U/min
 Current: 2.20A
 Power Factor: 0.78
 Efficiency: 78.4%
 Torque: 1.88Nm

Frequenzumrichter (In 1 PH, Out 3 PH)
 Optidrive P2 ODP-2-22220-1KF42-SN
 Max. Power: 2.2kW
 Max.Current: 10.5A
 Output Freq.: 0-500Hz
 Control Type: Open loop vector



Anzeige für
 Eingangsspannung / Eingangsstrom

Drehzahlanzeige (Encoder)

RS PRO
 - 229.6 L1 L2 L3 DM SY
 M K V A h
 - 0.000 L2 L3 M W Ø
 K V A r h
 - 0.000 L3 L1 Hz P F
 M K W h
 V/A P E Sys

moltrona
 00
 1/min
 C1 C2 C3 C4

Änderungen in der user.h Datei

```
#define USER_IQ_FULL_SCALE_FREQ_Hz           (231.0) // 800 -> (RPM * Poles) / 120
#define USER_IQ_FULL_SCALE_VOLTAGE_V        (1000.0) // 450.0 Example for hvkit_rev1p1 typical usage
#define I_A_offset                           (1.0001)
#define I_B_offset                           (0.9970)
#define I_C_offset                           (0.9907)
#define V_A_offset                           (0.1570)
#define V_B_offset                           (0.1565)
#define V_C_offset                           (0.1569)
#define USER_PWM_FREQ_kHz                   (18.0) // 30.0 Example, 8.0 - 30.0 KHz typical
#define USER_NUM_PWM_TICKS_PER_ISR_TICK     (2)
#define USER_NUM_CTRL_TICKS_PER_SPEED_TICK (10) // 15 Typical to match PWM
#define USER_NUM_CTRL_TICKS_PER_TRAJ_TICK  (10) // 15 Typical to match PWM

#define T_Motor                             311
#define USER_MOTOR                         T_Motor

#elif (USER_MOTOR == T_Motor)
#define USER_MOTOR_TYPE                    MOTOR_Type_Induction // Name must match the motor #define
// Motor_Type_Induction (Asynchronous ACI)
#define USER_MOTOR_NUM_POLE_PAIRS         (1) // PAIRS, not total poles. Used to calculate user RPM from rotor Hz only
#define USER_MOTOR_Rr                     (2.4062523) // Identified phase to neutral in a Y equivalent circuit (Ohms, float)
#define USER_MOTOR_Rs                     (4.4462552) // Identified phase to neutral in a Y equivalent circuit (Ohms, float)
#define USER_MOTOR_Ls_d                   (0.055235102) // For Induction, Identified average stator inductance (Henry, float)
#define USER_MOTOR_Ls_q                   USER_MOTOR_Ls_d // For Induction, Identified average stator inductance (Henry, float)
#define USER_MOTOR_RATED_FLUX             (0.8165*230.0/50.0) // sqrt(2/3) * Rated V (line-line) / Rated Freq (Hz)
#define USER_MOTOR_MAGNETIZING_CURRENT    (2.1070599) // Identified magnetizing current for induction motors, else NULL
#define USER_MOTOR_RES_EST_CURRENT        (0.5) // During Motor ID, maximum current (Amperes, float) used for Rs
#define USER_MOTOR_IND_EST_CURRENT        (NULL) // not used for induction
#define USER_MOTOR_MAX_CURRENT            (3.0) // CRITICAL: Used during ID and run-time, sets on the maximum current
#define USER_MOTOR_FLUX_EST_FREQ_Hz      (5.0) // During Motor ID, Should always use 5 Hz for Induction.
```

Original user.h Datei

```
#define USER_IQ_FULL_SCALE_FREQ_Hz           (800.0) // 800 -> (RPM * Poles) / 120
#define USER_IQ_FULL_SCALE_VOLTAGE_V        (450.0) // 450.0 Example for hvkit_rev1p1 typical usage
#define I_A_offset                           (0.9980847836)
#define I_B_offset                           (0.9969834685)
#define I_C_offset                           (0.9974584579)
#define V_A_offset                           (0.2433366776)
#define V_B_offset                           (0.2432493567)
#define V_C_offset                           (0.2434823513)
#define USER_PWM_FREQ_kHz                   (15.0) // 30.0 Example, 8.0 - 30.0 KHz typical
#define USER_NUM_PWM_TICKS_PER_ISR_TICK     (1)
#define USER_NUM_CTRL_TICKS_PER_SPEED_TICK (15) // 15 Typical to match PWM
#define USER_NUM_CTRL_TICKS_PER_TRAJ_TICK  (15) // 15 Typical to match PWM

#define Estun_EMJ_04APB22                   101
#define USER_MOTOR                         Estun_EMJ_04APB22

#if (USER_MOTOR == Estun_EMJ_04APB22)
#define USER_MOTOR_TYPE                    MOTOR_Type_Pm // Name must match the motor #define
// Motor_Type_Pm (All Synchronous: BLDC, PMSM, SMPM, IPM)
#define USER_MOTOR_NUM_POLE_PAIRS         (4) // PAIRS, not total poles. Used to calculate user RPM from rotor Hz only
#define USER_MOTOR_Rr                     (NULL) // Induction motors only, else NULL
#define USER_MOTOR_Rs                     (2.200221) // Identified phase to neutral in a Y equivalent circuit (Ohms, float)
#define USER_MOTOR_Ls_d                   (0.008721023) // For PM, Identified average stator inductance (Henry, float)
#define USER_MOTOR_Ls_q                   (0.008721023) // For PM, Identified average stator inductance (Henry, float)
#define USER_MOTOR_RATED_FLUX             (0.3846985) // Identified TOTAL flux linkage between the rotor and the stator (V/Hz)
#define USER_MOTOR_MAGNETIZING_CURRENT    (NULL) // Induction motors only, else NULL
#define USER_MOTOR_RES_EST_CURRENT        (1.0) // During Motor ID, maximum current (Amperes, float) used for Rs
#define USER_MOTOR_IND_EST_CURRENT        (-1.0) // During Motor ID, maximum current (negative Amperes, float)
#define USER_MOTOR_MAX_CURRENT            (3.82) // CRITICAL: Used during ID and run-time, sets on the maximum current
#define USER_MOTOR_FLUX_EST_FREQ_Hz      (20.0) // During Motor ID, maximum commanded speed (Hz, float), ~10% rated
```

Es wurde mit der proj_lab02b-Software (PWM-Frequenz = 18kHz) die **Motor-Parameter** ermittelt und in der user.h-Datei eingetragen. Der Motortest wurde mit der proj_lab11a-Software durchgeführt.

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Ansteuerung mit InstaSPIN (proj_lab11a)

