# QT2-500

## COMMUNICATION SPECIFICATION

(Protocol A)

DAIICHI ELECTRONICS CO., LTD.

Content

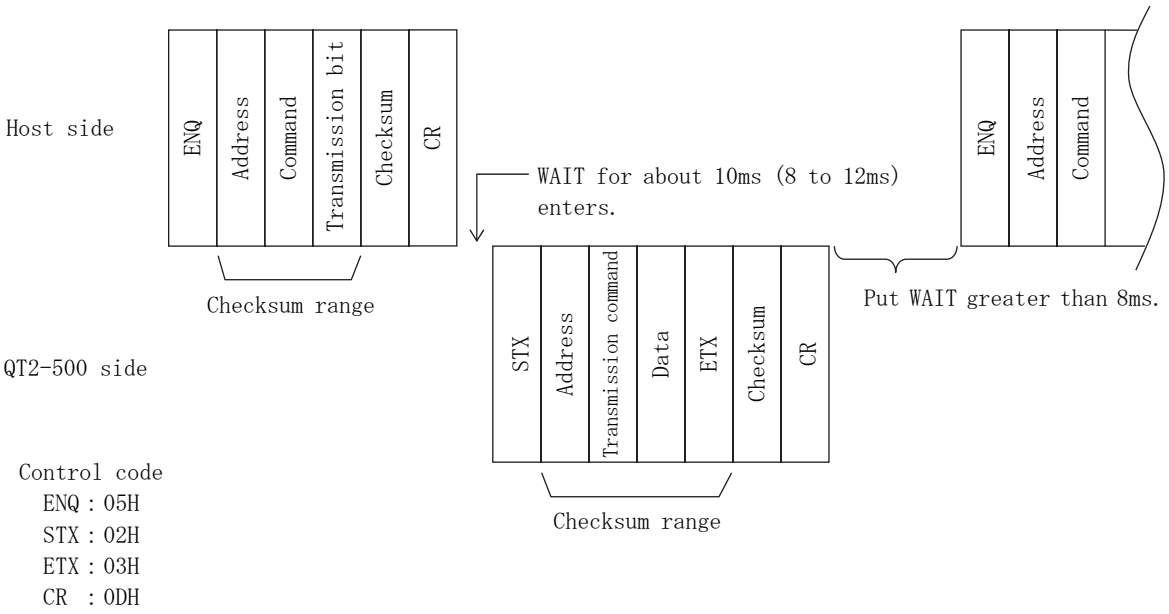
## 1. Communication specification

| Item | Specification | Default setting |
|---|---|---|
| Standard | TIA-485-A (2003) | ── |
| Protocol | Protocol A | ── |
| Transmission system | Half-duplex two-wire system | ── |
| Synchronous system | Asynchronous communication method | ── |
| Transmission rate (1) | 2400bps / 4800bps / 9600bps / 19200bps | 9600bps |
| Modulation code | NRZ | ── |
| Start bit | 1 bit | ── |
| Data length (1) | 7 bit / 8 bit | 7 bit |
| Parity (1) | NONE (Nothing) / ODD (Odd number) / EVEN (Even number) | EVEN (Even number) |
| Stop bit (1) | 1 bit / 2 bit | 1 bit |
| Cable length | 1000m (The total extension) | ── |
| Address (1) | 1 to 254 (Connection is possible to 31 sets.) | 1 |
| Error detection | Checksum | ── |
| Transmission character | ASCII code | ── |

Transmission data are sent out from a bit 0.

Note(1) Settings can be changed.

## 2. Transmission and reception protocol




Control code
ENQ : 05H
STX : 02H
ETX : 03H
CR : 0DH

Address
Except 00H, set different addresses for each QT2-500 (254 stations from 01H to FEH).
Data is ASCII cord. (Address set up it in switch operation of QT2-500 in decimal number.)
If all address data is reset, please give an address as FFH (ASCII code : 46H 46H).

| 0 | A | ← Address data 0AH (Setting : 10) |
|---|---|---|
| 30H | 41H | ← Transmission data |

## 3. Command (ASCII 2 digit)

Specifies the transmission response on the QT2-500 side in response to a request from the upper side.

| Host side request command | | | QT2-500 side transmission response | | |
|---|---|---|---|---|---|
| ASCII | | Contents of request | ASCII | | Contents of transmission |
| 30H | 38H | Settings data | 38H | 38H | Settings data |
| 32H | 30H | All data 1 (General measurement) | 41H | 30H | All data 1 (General measurement) |
| 32H | 32H | All data 3 (Current harmonics : Instantaneous maximum value of each phase) | 41H | 32H | All data 3 (Current harmonics : Instantaneous maximum value of each phase) |
| 32H | 33H | All data 4 (Voltage harmonics : Instantaneous maximum value between each phase / line) | 41H | 33H | All data 4 (Voltage harmonics : Instantaneous maximum value between each phase / line) |
| 35H | 34H | Data reset | 44H | 34H | Data reset OK |
| 35H | 35H | All address data reset | — | — | No response |
| 37H | 30H | Model code | 46H | 30H | Model code |

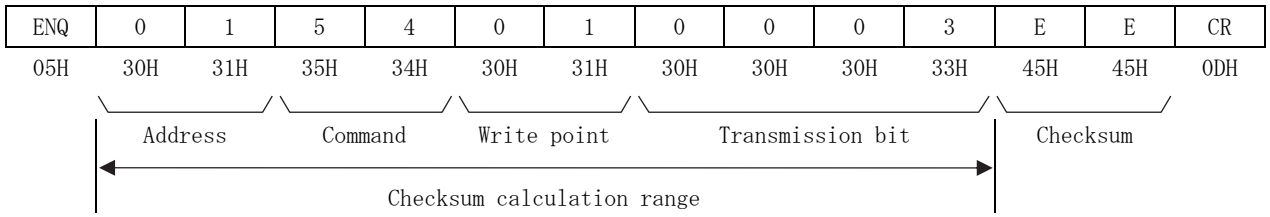
## 4. Checksum

All checksum range characters are added in ASCII code. Set the lower 8 bits of the answer with 2 digits hexadecimal ASCII characters.

(The example of calculation of a checksum.)

If data reset of address 01H is required.

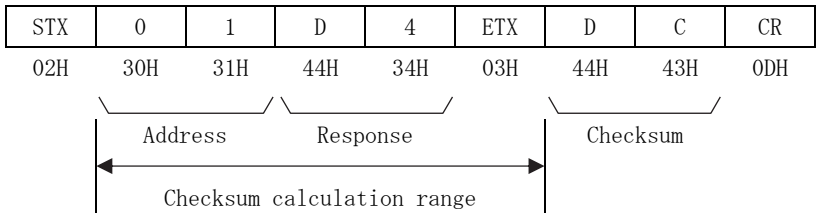
(1) Host side ⟶ QT2-500 side




Calculation of checksum

30H + 31H + 35H + 34H + 30H + 31H + 30H + 30H + 30H + 33H ＝ 1EE ≠ EE

(2) QT2-500 side ⟶ Host side




Calculation of checksum

30H + 31H + 44H + 34H + 03H ＝ 0DCH

## 5. Scaling of measurement data, and the kind of data

(1) Scaling of measurement data.

| Item | | Input | | | Communication data | Intrinsic error |
|---|---|---|---|---|---|---|
| Voltage | 3P3W<br>1P2W<br>3P4W | AC0 to 150V, AC0 to 300V, AC0 to 600V (Line)<br>AC0 to 150/√3V, AC0 to 300/√3V,<br>AC0 to 600/√3V (Phase) | | | 0000H to 07D0H<br>(0 to 2000) | ±0.2% |
| | 1P3W<br>(2) | AC0 to 300V, AC0 to 600V (Line) | | | 0000H to 07D0H<br>(0 to 2000) | |
| | | AC0 to 150V,<br>AC0 to 300V<br>(Phase) | | Phase voltage full scale 150V, 300V setting | 0000H to 07D0H<br>(0 to 2000) | |
| | | | | Phase voltage full scale 300V, 600V setting | 0000H to 03E8H<br>(0 to 1000) | |
| Current,<br>Demand current,<br>Maximum demand current | | AC0 to 5A | | | 0000H to 07D0H<br>(0 to 2000) | ±0.2% |
| | | AC0 to 1A | | | | ±0.5% |
| Power,<br>Demand power,<br>Maximum demand power | 3P3W<br>1P3W<br>3P4W | 5A | 110V | -1kW to 0 to +1kW | 0000H to 03E8H to 07D0H<br>(0 to 1000 to 2000) | ±0.3% |
| | | | 220V | -2kW to 0 to +2kW | | |
| | | | 440V | -4kW to 0 to +4kW | | |
| | | 1A | 110V | -200W to 0 to +200W | | ±0.5% |
| | | | 220V | -400W to 0 to +400W | | |
| | | | 440V | -800W to 0 to +800W | | |
| | 1P2W | 5A | 110V | -500W to 0 to +500W | | ±0.3% |
| | | | 220V | -1kW to 0 to +1kW | | |
| | | | 440V | -2kW to 0 to +2kW | | |
| | | 1A | 110V | -100W to 0 to +100W | | ±0.5% |
| | | | 220V | -200W to 0 to +200W | | |
| | | | 440V | -400W to 0 to +400W | | |
| Reactive power | 3P3W<br>1P3W<br>3P4W | 5A | 110V | LEAD 1kvar to 0 to LAG 1kvar | 0000H to 03E8H to 07D0H<br>(0 to 1000 to 2000) | ±0.3% |
| | | | 220V | LEAD 2kvar to 0 to LAG 2kvar | | |
| | | | 440V | LEAD 4kvar to 0 to LAG 4kvar | | |
| | | 1A | 110V | LEAD 200var to 0 to LAG 200var | | ±0.5% |
| | | | 220V | LEAD 400var to 0 to LAG 400var | | |
| | | | 440V | LEAD 800var to 0 to LAG 800var | | |
| | 1P2W | 5A | 110V | LEAD 500var to 0 to LAG 500var | | ±0.3% |
| | | | 220V | LEAD 1kvar to 0 to LAG 1kvar | | |
| | | | 440V | LEAD 2kvar to 0 to LAG 2kvar | | |
| | | 1A | 110V | LEAD 100var to 0 to LAG 100var | | ±0.5% |
| | | | 220V | LEAD 200var to 0 to LAG 200var | | |
| | | | 440V | LEAD 400var to 0 to LAG 400var | | |
| Apparent power | 3P3W<br>1P3W<br>3P4W | 5A | 110V | 0 to 1kVA | 03E8H to 07D0H<br>(1000 to 2000) | ±0.3% |
| | | | 220V | 0 to 2kVA | | |
| | | | 440V | 0 to 4kVA | | |
| | | 1A | 110V | 0 to 200VA | | ±0.5% |
| | | | 220V | 0 to 400VA | | |
| | | | 440V | 0 to 800VA | | |
| | 1P2W | 5A | 110V | 0 to 500VA | | ±0.3% |
| | | | 220V | 0 to 1kVA | | |
| | | | 440V | 0 to 2kVA | | |
| | | 1A | 110V | 0 to 100VA | | ±0.5% |
| | | | 220V | 0 to 200VA | | |
| | | | 440V | 0 to 400VA | | |
| Power factor | | 5A | LEAD 0 to 1 to LAG 0 | | 0000H to 03E8H to 07D0H<br>(0 to 1000 to 2000) | ±1.0% |
| | | 1A | | | | ±1.5% |
| Frequency | | 45 to 55Hz | | | 0000H to 07D0H<br>(0 to 2000) | ±0.2% |
| | | 55 to 65Hz | | | | |
| | | 45 to 65Hz | | | | |

<table>
<tr><th colspan="2">Item</th><th colspan="4">Input</th><th>Communication data</th><th>Intrinsic error</th></tr>
<tr><td rowspan="2">Distortion,<br>Harmonic nth content rate,<br>Harmonic 5th conversion content rate</td><td>Voltage</td><td colspan="4">0.0 to 20.0%</td><td>0000H to 0190H<br>(0 to 400)</td><td>±2.0%</td></tr>
<tr><td>Current</td><td>5A</td><td colspan="3" rowspan="2">0.0 to 100.0%</td><td rowspan="2">0000H to 07D0H<br>(0 to 2000)</td><td>±2.0%</td></tr>
<tr><td></td><td>1A</td><td>±2.5%</td></tr>
<tr><td rowspan="5">Fundamental RMS value,<br>Harmonic nth RMS,<br>Harmonic 5th conversion RMS</td><td rowspan="4">Voltage</td><td rowspan="2">3P3W<br>1P2W<br>3P4W</td><td colspan="2">AC0 to 150V, AC0 to 300V, AC0 to 600V (Line)<br>AC0 to 150/√3V, AC0 to 300/√3V, AC0 to 600/√3V (Phase)</td><td>0000H to 07D0H<br>(0 to 2000)</td><td rowspan="4">±1.0%</td></tr>
<tr><td rowspan="3">1P3W<br>(2)</td><td colspan="2">AC0 to 300V, AC0 to 600V (Line)</td><td>0000H to 07D0H<br>(0 to 2000)</td></tr>
<tr><td rowspan="2">AC0 to 150V,<br>AC0 to 300V<br>(Phase)</td><td>Phase voltage full scale 150V, 300V setting</td><td>0000H to 07D0H<br>(0 to 2000)</td></tr>
<tr><td>Phase voltage full scale 300V, 600V setting</td><td>0000H to 03E8H<br>(0 to 1000)</td></tr>
<tr><td rowspan="2">Current</td><td colspan="3">AC0 to 5A</td><td rowspan="2">0000H to 07D0H<br>(0 to 2000)</td><td>±1.0%</td></tr>
<tr><td colspan="3">AC0 to 1A</td><td>±2.0%</td></tr>
<tr><td colspan="2" rowspan="2">Active energy<br>(Incomming / Outgoing)</td><td>5A</td><td colspan="2" rowspan="2">0 to 99999.9</td><td rowspan="2">0 to 999999 (BCD data)</td><td>±1.0%</td></tr>
<tr><td>1A</td><td>±2.0%</td></tr>
<tr><td colspan="2" rowspan="2">Reactive energy (Incomming / Outgoing, LAG/LEAD)</td><td>5A</td><td colspan="2" rowspan="2">0 to 99999.9</td><td rowspan="2">0 to 999999 (BCD data)</td><td>±2.0%</td></tr>
<tr><td>1A</td><td></td></tr>
</table>

Note(2) The phase voltage (U1N, U3N) of single-phase three-wire is maximum of 150V (300V), the communication data at phase voltage full-scale setting 300V is 0000H to 03E8H (0 to 1000).
If phase voltage full-scale setting is 150V (300V), communication data is 0H to 07D0H (0 to 2000) in AC0 to 150V.
The default setting of phase voltage full-scale setting is 150V (300V).

(2) The upper limit limiter of measurement data, and a low input cut.

| Item | | Input | | | Upper / Lower limiter | Low input cut |
|---|---|---|---|---|---|---|
| Voltage | 3P3W<br>1P2W<br>3P4W | AC0 to 150V, AC0 to 300V, AC0 to 600V (Line)<br>AC0 to 150/√3V, AC0 to 300/√3V,<br>AC0 to 600/√3V (Phase) | | | 120% of full-scale (2400) | Below 1% of full-scale (20) |
| | 1P3W<br>(3) | AC0 to 300V, AC0 to 600V, AC0 to 1200V (Line) | | | | |
| | | AC0 to 150V,<br>AC0 to 300V<br>(Phase) | | Phase voltage full scale 150V, 300V setting | | |
| | | | | Phase voltage full scale 300V, 600V setting | 120% of full-scale (1200) | Below 1% of full-scale (10) |
| Current,<br>Demand current,<br>Maximum demand current | | AC0 to 5A | | | 120% of rating (2400) | Below 0.2% of rating (4) |
| | | AC0 to 1A | | | | Below 0.5% of rating (10) |
| Power,<br>Demand power,<br>Maximum demand power | 3P3W<br>1P3W<br>3P4W | 5A | 110V | -1kW to 0 to +1kW | + side<br>:120% of rating<br>- side<br>:100% of rating<br>(+ side:2200)<br>(- side: 0) | Below 0.3% of rating (±3) |
| | | | 220V | -2kW to 0 to +2kW | | |
| | | | 440V | -4kW to 0 to +4kW | | |
| | | 1A | 110V | -200W to 0 to +200W | | Below 0.5% of rating (±5) |
| | | | 220V | -400W to 0 to +400W | | |
| | | | 440V | -800W to 0 to +800W | | |
| | 1P2W | 5A | 110V | -500W to 0 to +500W | | Below 0.5% of rating (±3) |
| | | | 220V | -1kW to 0 to +1kW | | |
| | | | 440V | -2kW to 0 to +2kW | | |
| | | 1A | 110V | -100W to 0 to +100W | | Below 0.5% of rating (±5) |
| | | | 220V | -200W to 0 to +200W | | |
| | | | 440V | -400W to 0 to +400W | | |
| Reactive power | 3P3W<br>1P3W<br>3P4W | 5A | 110V | LEAD 1kvar to 0 to LAG 1kvar | LAG side<br>:120% of rating<br>LEAD side<br>:100% of rating<br>(LAG side :2200)<br>(LEAD side: 0) | Below 0.3% of rating (±3) |
| | | | 220V | LEAD 2kvar to 0 to LAG 2kvar | | |
| | | | 440V | LEAD 4kvar to 0 to LAG 4kvar | | |
| | | 1A | 110V | LEAD 200var to 0 to LAG 200var | | Below 0.5% of rating (±5) |
| | | | 220V | LEAD 400var to 0 to LAG 400var | | |
| | | | 440V | LEAD 800var to 0 to LAG 800var | | |
| | 1P2W | 5A | 110V | LEAD 500var to 0 to LAG 500var | | Below 0.3% of rating (±3) |
| | | | 220V | LEAD 1kvar to 0 to LAG 1kvar | | |
| | | | 440V | LEAD 2kvar to 0 to LAG 2kvar | | |
| | | 1A | 110V | LEAD 100var to 0 to LAG 100var | | Below 0.5% of rating (±5) |
| | | | 220V | LEAD 200var to 0 to LAG 200var | | |
| | | | 440V | LEAD 400var to 0 to LAG 400var | | |
| Apparent power | 3P3W<br>1P3W<br>3P4W | 5A | 110V | 0 to 1kVA | 120% of rating (2200) | Below 0.3% of rating (3) |
| | | | 220V | 0 to 2kVA | | |
| | | | 440V | 0 to 4kVA | | |
| | | 1A | 110V | 0 to 200VA | | Below 0.5% of rating (5) |
| | | | 220V | 0 to 400VA | | |
| | | | 440V | 0 to 800VA | | |
| | 1P2W | 5A | 110V | 0 to 500VA | | Below 0.3% of rating (3) |
| | | | 220V | 0 to 1kVA | | |
| | | | 440V | 0 to 2kVA | | |
| | | 1A | 110V | 0 to 100VA | | Below 0.5% of rating (5) |
| | | | 220V | 0 to 200VA | | |
| | | | 440V | 0 to 400VA | | |
| Power factor | | 5A | LEAD 0 to 1 to LAG 0 | | 0 to 1000 to 2000 (LEAD 0 to 1 to LAG 0 fixed) | Below 20% of voltage full scale. Below 2% of rated current. |
| | | 1A | | | | |

| Item | | Input | | | Upper / Lower limiter | Low input cut |
|---|---|---|---|---|---|---|
| Frequency | | 45 to 55Hz | | | 120% of span (0 to 2400) | Below 20% of voltage full scale |
| | | 55 to 65Hz | | | | |
| | | 45 to 65Hz | | | | |
| Distortion factor, Harmonic nth content rate, Harmonic 5th conversion content rate | Voltage | 0.0 to 20.0% | | | 100% (2000) | By harmonic rms value |
| | Current | 5A | 0.0 to 100.0% | | 200% (4000) | |
| | | 1A | | | | |
| Fundamental RMS value, ([3]) Harmonic nth RMS value, Harmonic 5th conversion RMS value | Voltage | 3P3W 1P2W 3P4W | AC0 to 150V, AC0 to 300V, AC0 to 600V (Line) AC0 to 150/√3V, AC0 to 300/√3V, AC0 to 600/√3V (Phase) | | 120% of full-scale (2400) | Below 0.3% of full scale (6) |
| | | 1P3W ([4]) | AC0 to 300V, AC0 to 600V (Line) | | | |
| | | | AC0 to 150V, AC0 to 300V (Phase) | Phase voltage full scale 150V, 300V setting | | |
| | | | | Phase voltage full scale 300V, 600V setting | 120% of full-scale (1200) | Below 0.3% of full scale (3) |
| | Current | AC0 to 5A | | | 120% of rating (2400) | Below 0.3% of rating (6) |
| | | AC0 to 1A | | | | |

Note([3]) Low input cut of RMS value is below 3% of full scale.
At this time, the total order of harmonic measurement is 0.

Note([4]) The upper limit value and low input cut value differ depending on the phase voltage full scale setting.

## 6. Details of settings data

By transmitting a settings data request command, it transmits the next settings data from the QT2-500 side.

■ Read point list

| Read point | Setting value |
|---|---|
| 01 | VT ratio |
| 02 | CT ratio |
| 03 | Frequency measurement range |
| 04 | Demand current, Time interval |
| 05 | Demand power, Time interval |
| 06 | Harmonic, Time interval |

■ Details of settings data

Numbers in parentheses represent decimal data.

(1) VT ratio

VT ratio = Primary rating value ／110V

| Primary rating (V) | Setting data | Primary rating (V) | Setting data |
|---|---|---|---|
| 110 | 0001H (1) | 16.5k | 0096H (150) |
| 220 | 0002H (2) | 18.4k (5) | 00A7H (167) |
| 440 | 0004H (4) | 22k | 00C8H (200) |
| 880 | 0008H (8) | 33k | 012CH (300) |
| 1100 | 000AH (10) | 66k | 0258H (600) |
| 1650 | 000FH (15) | 77k | 02BCH (700) |
| 2200 | 0014H (20) | 110k | 03E8H (1000) |
| 3300 | 001EH (30) | 132k | 04B0H (1200) |
| 6600 | 003CH (60) | 154k | 0578H (1400) |
| 11k | 0064H (100) | 187k | 06A4H (1700) |
| 13.2k | 0078H (120) | 220k | 07D0H (2000) |
| 13.8k (5) | 007DH (125) | | |

Note(5) When divided by 110V, it becomes a fraction and becomes the unique set value data.

(2) CT ratio

CT ratio = Primary rating value ／5A×10

| Primary rating (A) | Setting data | Primary rating (A) | Setting data | Primary rating (A) | Setting data |
|---|---|---|---|---|---|
| 5 | 000AH (10) | 120 | 00F0H (240) | 2000 | 0FA0H (4000) |
| 6 | 000CH (12) | 150 | 012CH (300) | 2500 | 1388H (5000) |
| 7.5 | 000FH (15) | 200 | 0190H (400) | 3000 | 1770H (6000) |
| 8 | 0010H (16) | 250 | 01F4H (500) | 4000 | 1F40H (8000) |
| 10 | 0014H (20) | 300 | 0258H (600) | 5000 | 2710H (10000) |
| 12 | 0018H (24) | 400 | 0320H (800) | 6000 | 2EE0H (12000) |
| 15 | 001EH (30) | 500 | 03E8H (1000) | 7500 | 3A98H (15000) |
| 20 | 0028H (40) | 600 | 04B0H (1200) | 8000 | 3E80H (16000) |
| 25 | 0032H (50) | 750 | 05DCH (1500) | 9000 | 4650H (18000) |
| 30 | 003CH (60) | 800 | 0640H (1600) | 10000 | 4E20H (20000) |
| 40 | 0050H (80) | 900 | 0708H (1800) | 12000 | 5DC0H (24000) |
| 50 | 0064H (100) | 1000 | 07D0H (2000) | 15000 | 7530H (30000) |
| 60 | 0078H (120) | 1200 | 0960H (2400) | 20000 | 9C40H (40000) |
| 75 | 0096H (150) | 1500 | 0BB8H (3000) | 30000 | EA60H (60000) |
| 80 | 00A0H (160) | 1600 | 0C80H (3200) | | |
| 100 | 00C8H (200) | 1800 | 0E10H (3600) | | |

(3) Frequency measurement range

| Frequency range | Setting data |
|---|---|
| 45 to 55Hz | 0001H (1) |
| 55 to 65Hz | 0002H (2) |
| 45 to 65Hz | 0003H (3) |

(4) Time interval of demand current, demand power

| Time interval | Setting data | Time interval | Setting data | Time interval | Setting data |
|---|---|---|---|---|---|
| 0 secod | 0000H (0) | 1 minute | 003CH (60) | 8 minutes | 01E0H (480) |
| 5 seconds | 0005H (5) | 2 minutes | 0078H (120) | 9 minutes | 021CH (540) |
| 10 seconds | 000AH (10) | 3 minutes | 00B4H (180) | 10 minutes | 0258H (600) |
| 20 seconds | 0014H (20) | 4 minutes | 00F0H (240) | 15 minutes | 0384H (900) |
| 30 seconds | 001EH (30) | 5 minutes | 012CH (300) | 20 minutes | 04B0H (1200) |
| 40 seconds | 0028H (40) | 6 minutes | 0168H (360) | 25 minutes | 05DCH (1500) |
| 50 seconds | 0032H (50) | 7 minutes | 01A4H (420) | 30 minutes | 0708H (1800) |

(5) Harmonic average value time interval
Average value, time interval ＝ Setting data

| Time interval | Setting data |
|---|---|
| 0 minute | 0000H (0) |
| 1 minute | 0001H (1) |
| 2 minutes | 0002H (2) |
| 5 minutes | 0005H (5) |
| 10 minutes | 000AH (10) |
| 15 minutes | 000FH (15) |
| 30 minutes | 001EH (30) |

## 7. Multiplying factor data

| Multiplying factor | Setting data |
|---|---|
| ×0.01 | 0005H (5) |
| ×0.1 | 0006H (6) |
| ×1 | 0000H (0) |
| ×10 | 0001H (1) |
| ×100 | 0002H (2) |
| ×1000 | 0003H (3) |
| ×10000 | 0004H (4) |
| ×100000 | 0007H (7) |
| ×1000000 | 0008H (8) |

## 8. Data reset

Receives a 4-digit ASCII code and resets the maximum data value.

| Write point | Data reset | | |
|---|---|---|---|
| 01 | #2 | $2^7$ | 0 |
| | | $2^6$ | 0 |
| | | $2^5$ | 0 |
| | | $2^4$ | 0 |
| | | $2^3$ | 0 |
| | | $2^2$ | 0 |
| | | $2^1$ | 0 |
| | | $2^0$ | 0 |
| | #1 | $2^7$ | 0 |
| | | $2^6$ | 0 |
| | | $2^5$ | 0 |
| | | $2^4$ | 0 |
| | | $2^3$ | 0 |
| | | $2^2$ | 0 |
| | | $2^1$ | Maximum demand power |
| | | $2^0$ | Maximum demand curret |

Set 1 to the element to be reset.

<Cautions> Even if the point of 0 sets data, it does not do data reset. And, it does not reset the factor without relevance with input specification.

## 9. Model code

By transmitting a model code request command, it transmits the following model code data from the QT2-500 side.

| Specification | Data code | Content |
|---|---|---|
| Series code | 05H | Multi tranducer |
| Type code | 01H | QT2-500 |
| Phase wire | 01H | 3P3W (2VT·2CT) |
| | 02H | 1P3W |
| | 05H | 1P2W |
| | 06H | 3P4W (3VT·3CT) |
| | 07H | 3P3W (2VT·3CT) |
| | 08H | 3P4W (2VT·3CT) |
| Rated volate | 01H | AC110V or 110/$\sqrt{3}$V |
| | 02H | AC220V or 220/$\sqrt{3}$V |
| | 03H | AC440V or 440/$\sqrt{3}$V |
| Rated current | 01H | 5A |
| | 02H | 1A |

Example) In the case of QT2-500 (3P3W, Rated voltage AC110V, Rated current 5A), it transmits the following model codes.

| 30H | 35H | 30H | 31H | 30H | 31H | 30H | 31H | 30H | 31H |
|---|---|---|---|---|---|---|---|---|---|
| Series code | | Type code | | Phase line | | Rated voltage | | Rated current | |

## 10. All data

Transmits the data of the bit set to 1.

(1) All data 1 [General measurement]　　0 : No transmission data (spare)　＊: Transmission data 0

| Transmission bit | | 3P3W | 3P4W | 1P3W | 1P2W |
|---|---|---|---|---|---|
| ＃6 | $2^7$ | 0 | 0 | 0 | 0 |
| | $2^6$ | 0 | 0 | 0 | 0 |
| | $2^5$ | 0 | 0 | 0 | 0 |
| | $2^4$ | Multiplying factor | Multiplying factor | Multiplying factor | Multiplying factor |
| | $2^3$ | 0 | 0 | 0 | 0 |
| | $2^2$ | 0 | 0 | 0 | 0 |
| | $2^1$ | CT ratio | CT ratio | CT ratio | CT ratio |
| | $2^0$ | VT ratio | VT ratio | VT ratio | VT ratio |
| ＃5 | $2^7$ | 0 | 0 | 0 | 0 |
| | $2^6$ | Outgoing LEAD varh | Outgoing LEAD varh | Outgoing LEAD varh | Outgoing LEAD varh |
| | $2^5$ | Outgoing LAG varh | Outgoing LAG varh | Outgoing LAG varh | Outgoing LAG varh |
| | $2^4$ | Outgoing Wh | Outgoing Wh | Outgoing Wh | Outgoing Wh |
| | $2^3$ | 0 | 0 | 0 | 0 |
| | $2^2$ | 0 | 0 | 0 | 0 |
| | $2^1$ | ＊ | ＊ | ＊ | ＊ |
| | $2^0$ | 0 | 0 | 0 | 0 |
| ＃4 | $2^7$ | 0 | 0 | 0 | 0 |
| | $2^6$ | ＊ | ＊ | ＊ | ＊ |
| | $2^5$ | ΣPdmax | ΣPdmax | ΣPdmax | Pdmax |
| | $2^4$ | ΣPd | ΣPd | ΣPd | Pd |
| | $2^3$ | ΣS | ΣS | ΣS | S |
| | $2^2$ | Incoming LEAD varh | Incoming LEAD varh | Incoming LEAD varh | Incoming LEAD varh |
| | $2^1$ | Incoming LAG varh | Incoming LAG varh | Incoming LAG varh | Incoming LAG varh |
| | $2^0$ | Incoming Wh | Incoming Wh | Incoming Wh | Incoming Wh |
| ＃3 | $2^7$ | ＊ | IdmaxN | ＊ | ＊ |
| | $2^6$ | Idmax3 | Idmax3 | IdmaxN | ＊ |
| | $2^5$ | Idmax2 | Idmax2 | Idmax3 | ＊ |
| | $2^4$ | Idmax1 | Idmax1 | Idmax1 | Idmax |
| | $2^3$ | ＊ | IdN | ＊ | ＊ |
| | $2^2$ | Id3 | Id3 | IdN | ＊ |
| | $2^1$ | Id2 | Id2 | Id3 | ＊ |
| | $2^0$ | Id1 | Id1 | Id1 | Id |
| ＃2 | $2^7$ | ＊ | IN | ＊ | ＊ |
| | $2^6$ | ＊ | U3N | ＊ | ＊ |
| | $2^5$ | ＊ | U2N | ＊ | ＊ |
| | $2^4$ | ＊ | U1N | ＊ | ＊ |
| | $2^3$ | Idmax ($^6$) | Idmax ($^6$) | Idmax ($^6$) | Idmax |
| | $2^2$ | Id ($^6$) | Id ($^6$) | Id ($^6$) | Id |
| | $2^1$ | f | f | f | f |
| | $2^0$ | ΣPF | ΣPF | ΣPF | PF |
| ＃1 | $2^7$ | ΣQ | ΣQ | ΣQ | Q |
| | $2^6$ | ΣP | ΣP | ΣP | P |
| | $2^5$ | U31 | U31 | U13 | ＊ |
| | $2^4$ | U23 | U23 | U3N | ＊ |
| | $2^3$ | U12 | U12 | U1N | U |
| | $2^2$ | I3 | I3 | IN | ＊ |
| | $2^1$ | I2 | I2 | I3 | ＊ |
| | $2^0$ | I1 | I1 | I1 | I |

Note($^6$) Maximum value of each phase (excluding 1P2W)

<Note> Only the data of the element specified by the transmission bit is transmitted. (Data will not be sent if there is no specification.) Data is not transmitted even if 0 is set to 1. (For spare) However, when data for ＊ is requested, "0000H" (ASCII code: 30H 30H 30H 30H) is sent as data.

Example) When requesting all data that can be specified.
＃6＝13H、＃5＝72H、＃4＝7FH、＃3＝FFH、＃2＝FFH、＃1＝FFH
Convert to ASCII code and set the transmission bit as follows.

| ＃6 | | ＃5 | | ＃4 | | ＃3 | | ＃2 | | ＃1 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 31H | 33H | 37H | 32H | 37H | 46H | 46H | 46H | 46H | 46H | 46H | 46H |

■ Integration data

Converts six digits of BCD data with an ASCII code, and transmit.
Scaling of integration data is unnecessary.

| Integration data | |
|---|---|
| kWh (Incoming) | : Active energy (Decimal point single digit) |
| kvarh (Incoming LAG) | : Reactive energy (Decimal point single digit) |
| kvarh (Incoming LEAD) | : Reactive energy (Decimal point single digit) |
| kWh (Outgoing) | : Active energy (Decimal point single digit) |
| kvarh (Outgoing LAG) | : Reactive energy (Decimal point single digit) |
| kvarh (Outgoing LEAD) | : Reactive energy (Decimal point single digit) |

Scaling of the integration data is done by setting of VT ratio and CT ratio.
Integration data is set to kWh (kvarh) by imposing the following multiplier.
Example) Active energy (kWh) = Integration data × Multiplying factor data =123.4×100=12340kWh

(2) All data 3 [Current harmonic : Instantaneous value of maximum phase] <excluding 1P2W>

| Transmission bit | | 3P3W, 3P4W, 1P3W, 1P2W | Transmission bit | | 3P3W, 3P4W, 1P3W, 1P2W |
|---|---|---|---|---|---|
| #6 | $2^7$ | 0 | #3 | $2^7$ | 15th content rate HI |
| | $2^6$ | 0 | | $2^6$ | 13th content rate HI |
| | $2^5$ | 0 | | $2^5$ | 11th content rate HI |
| | $2^4$ | 0 | | $2^4$ | 9th content rate HI |
| | $2^3$ | 0 | | $2^3$ | 7th content rate HI |
| | $2^2$ | 0 | | $2^2$ | 5th content rate HI |
| | $2^1$ | 0 | | $2^1$ | * |
| | $2^0$ | 0 | | $2^0$ | 3rd content rate HI |
| #5 | $2^7$ | 0 | #2 | $2^7$ | 15th RMS value HI |
| | $2^6$ | 0 | | $2^6$ | 13th RMS value HI |
| | $2^5$ | 0 | | $2^5$ | 11th RMS value HI |
| | $2^4$ | 0 | | $2^4$ | 9th RMS value HI |
| | $2^3$ | 0 | | $2^3$ | 7th RMS value HI |
| | $2^2$ | 0 | | $2^2$ | 5th RMS value HI |
| | $2^1$ | 0 | | $2^1$ | * |
| | $2^0$ | 0 | | $2^0$ | 3rd RMS value HI |
| #4 | $2^7$ | 0 | #1 | $2^7$ | 0 |
| | $2^6$ | 0 | | $2^6$ | 0 |
| | $2^5$ | 0 | | $2^5$ | 0 |
| | $2^4$ | 0 | | $2^4$ | 0 |
| | $2^3$ | 0 | | $2^3$ | 5th conversion content rate HI |
| | $2^2$ | 0 | | $2^2$ | Distortion factor HI |
| | $2^1$ | 0 | | $2^1$ | 5th conversion RMS value HI |
| | $2^0$ | CT ratio | | $2^0$ | Fundamental-wave RMS value HI |

0 : No transmission data (spare)
* : Transmission data 0
Transmit maximum phase

<Note> Only the data of the element specified by the transmission bit is transmitted.
(Data will not be sent if there is no specification.)
Data is not transmitted even if 0 is set to 1. (For spare)

Example) When requesting all data that can be specified.
#6=00H、#5=00H、#4=01H、#3=FFH、#2=FFH、#1=0FH。
Convert to ASCII code and set the transmission bit as follows.

| #6 | | #5 | | #4 | | #3 | | #2 | | #1 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 30H | 30H | 30H | 30H | 30H | 31H | 46H | 46H | 46H | 46H | 30H | 46H |

(3) All data 4 [Voltage harmonic : Instantaneous value of maximum value (maximum line)] <excluding 1P2W>

| Transmission bit | | 3P3W, 3P4W, 1P3W, 1P2W | Transmission bit | | 3P3W, 3P4W, 1P3W, 1P2W |
|---|---|---|---|---|---|
| #6 | $2^7$ | 0 | #3 | $2^7$ | 15th content rate HU |
| | $2^6$ | 0 | | $2^6$ | 13th content rate HU |
| | $2^5$ | 0 | | $2^5$ | 11th content rate HU |
| | $2^4$ | 0 | | $2^4$ | 9th content rate HU |
| | $2^3$ | 0 | | $2^3$ | 7th content rate HU |
| | $2^2$ | 0 | | $2^2$ | 5th content rate HU |
| | $2^1$ | 0 | | $2^1$ | * |
| | $2^0$ | 0 | | $2^0$ | 3rd content rate HU |
| #5 | $2^7$ | 0 | #2 | $2^7$ | 15th RMS value HU |
| | $2^6$ | 0 | | $2^6$ | 13th RMS value HU |
| | $2^5$ | 0 | | $2^5$ | 11th RMS value HU |
| | $2^4$ | 0 | | $2^4$ | 9th RMS value HU |
| | $2^3$ | 0 | | $2^3$ | 7th RMS value HU |
| | $2^2$ | 0 | | $2^2$ | 5th RMS value HU |
| | $2^1$ | 0 | | $2^1$ | * |
| | $2^0$ | 0 | | $2^0$ | 3rd RMS value HU |
| #4 | $2^7$ | 0 | #1 | $2^7$ | 0 |
| | $2^6$ | 0 | | $2^6$ | 0 |
| | $2^5$ | 0 | | $2^5$ | 0 |
| | $2^4$ | 0 | | $2^4$ | 0 |
| | $2^3$ | 0 | | $2^3$ | 5th conversion content rate HU |
| | $2^2$ | 0 | | $2^2$ | Distortion factor HU |
| | $2^1$ | 0 | | $2^1$ | 5th conversion RMS value HU |
| | $2^0$ | VT ratio | | $2^0$ | Fundamental-wave RMS value HU |

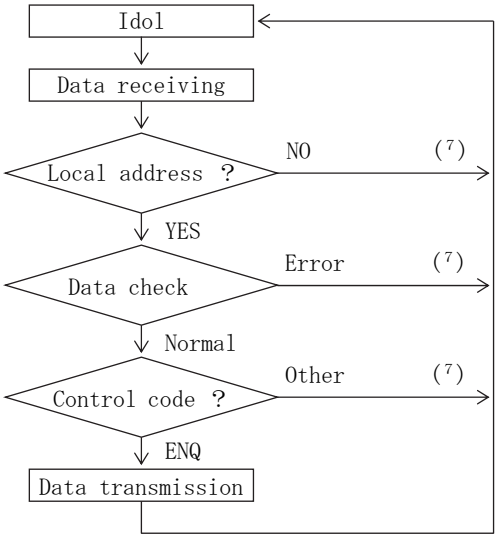
0 : No transmission data (spare)
* : Transmission data 0
Transmit maximum phase (maximum line).

<Note> Only the data of the element specified by the transmission bit is transmitted.
(Data will not be sent if there is no specification.)
Data is not transmitted even if 0 is set to 1. (For spare)

Example) When requesting all data that can be specified.
#6=00H、#5=00H、#4=01H、#3=FFH、#2=FFH、#1=0FH
Convert to ASCII code and set the transmission bit as follows.

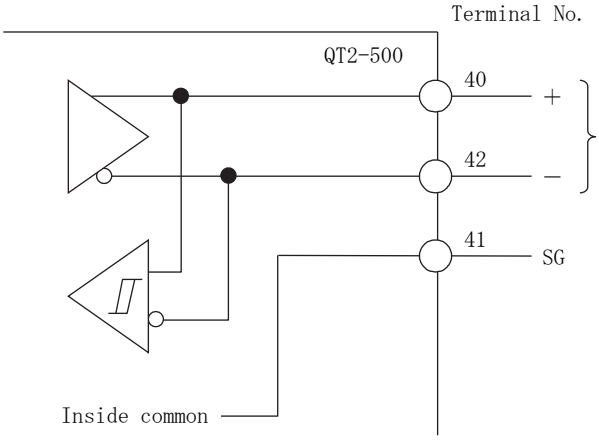
| #6 | | #5 | | #4 | | #3 | | #2 | | #1 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 30H | 30H | 30H | 30H | 30H | 31H | 46H | 46H | 46H | 46H | 30H | 46H |

## 11. Communication procedure of QT2-500




Note(7) Address mismatch
Data abnormal
Control code mismatch
} In no cases of an error, it transmits. Please transmit a demand command again.

## 12. QT2-500 communication specification terminal arrangement




Please connect the terminating resistor (accessories) to the terminating equipment on the connection form.
Connection terminal: Between 40 (+) and 42 (-)

## 13. Frame details (Settings data)

Host side ⟶ QT2-500

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|
| ENQ | Address | | 0 | 8 | Checksum | | CR |

QT2-500 ⟶ Host side

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| STX | Address | | 8 | 8 | VT ratio | | | | CT ratio | | | | Frequency range | | | |

| 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Demand current, Time interval | | | | Demand power, Time interval | | | | Harmonic, Time interval | | | | ETX | Checksum | | CR |

## 14. Frame details (Data reset)

Host side ⟶ QT2-500

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ENQ | Address | | 5 | 4 | Write point | | Data reset #2 | | #1 | | Checksum | | CR |
| | | | | | 0 | 1 | | | | | | | |

QT2-500 ⟶ Host side

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|
| STX | Address | | D | 4 | ETX | Checksum | | CR |

## 15. Frame details (All address data reset)

Host side ⟶ QT2-500

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ENQ | Address | | 5 | 5 | Write point | | Data reset #2 | | #1 | | Checksum | | CR |
| | | | | | 0 | 1 | | | | | | | |

There is no response to this command. (No response)

<Note> Refer to page 10 for data reset.
<Note> All address, please specify (FFH).

## 16. Frame details (Model code)

Host side ⟶ QT2-500

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|
| ENQ | Address | | 7 | 0 | Checksum | | CR |

QT2-500 ⟶ Host side

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| STX | Address | | F | 0 | Series code | | Model code | | Phase wire | | Rated voltage | | Rated current | |

| 16 | 17 | 18 | 19 |
|---|---|---|---|
| ETX | Checksum | | CR |

## 17. Frame details. All data (General measurement) <For 3-phase 3-wire>

Host side → QT2-500

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ENQ | Address | | 2 | 0 | #6 | | #5 | | #4 | | #3 | | #2 | | #1 | | Checksum | | CR |

The data specified by the transmission bit (see page 11) is transmitted.

QT2-500 ⟶ Host side

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| STX | Address | | A | 0 | $I_1$ 1-phase current | | | | $I_2$ 2-phase current | | | | $I_3$ 3-phase current | | | |

| 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| $U_{12}$ 12 line voltage | | | | $U_{23}$ 23 line voltage | | | | $U_{31}$ 31 line voltage | | | | P Active power | | | |

| 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Q Reactive power | | | | PF Power factor | | | | f Frequency | | | | Id : Demand current (Maximum value of each phase) | | | |

| 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Idmax. : Maximum demand current (Maximum value of each phase) | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | ($U_{1N}$ : 1-phase voltage) | | | | ($U_{2N}$ : 2-phase voltage) | | | | ($U_{3N}$ : 3-phase voltage) | | | |

| 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | $Id_1$ | | | | $Id_2$ | | | | $Id_3$ | | | |
| ($I_N$ : N-phase current) | | | | 1-phase demand current | | | | 2-phase demand current | | | | 3-phase demand current | | | |

| 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | $Idmax_1$ | | | | $Idmax_2$ | | | | $Idmax_3$ | | | |
| (IdN : N-phase demand current) | | | | 1-phase maximum demand current | | | | 2-phase maximum demand current | | | | 3-phase maximum demand current | | | |

| 98 | 99 | 100 | 101 | 102 | 103 | 104 | 105 | 106 | 107 | 108 | 109 | 110 | 111 | 112 | 113 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | Active energy (Incomming) | | | | | | Reactive energy (Incomming LAG) | | | | | |
| ($Idmax_N$ : N-phase maximum demand current) | | | | | | | | | | | | | | | |

| 114 | 115 | 116 | 117 | 118 | 119 | 120 | 121 | 122 | 123 | 124 | 125 | 126 | 127 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Reactive energy (Incomming LEAD) | | | | | | S Apparent power | | | | $P_d$ Demand power | | | |

| 128 | 129 | 130 | 131 | 132 | 133 | 134 | 135 | 136 | 137 | 138 | 139 | 140 | 141 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Pdmax Maximum demand power | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Active energy (Outgoing) | |

| 142 | 143 | 144 | 145 | 146 | 147 | 148 | 149 | 150 | 151 | 152 | 153 | 154 | 155 | 156 | 157 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Active energy (Outgoing) | | | | Reactive energy (Outgoing LAG) | | | | | | Reactive energy (Outgoing LEAD) | | | | | |

| 158 | 159 | 160 | 161 | 162 | 163 | 164 | 165 | 166 | 167 | 168 | 169 | 170 | 171 | 172 | 173 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VT ratio | | | | CT ratio | | | | Multiplying factor | | | | ETX | Checksum | | CR |

## 18. Frame details, All data 3 (Current harmonics : Instantaneous maximum value of each phase)
<Excluding single-phase 2-wire>

Host side → QT2-500

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ENQ | Address | | 2 | 2 | #6 | | #5 | | #4 | | #3 | | #2 | | #1 | | Checksum | | CR |

The data specified by the transmission bit (see page 12) is transmitted.

QT2-500 ⟶ Host side

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| STX | Address | | A | 2 | Fundamental RMS value Current | | | | 5th conversion RMS value Current | | | | Distortion factor Current | | | |

| 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5th conversion content rate, Current | | | | 3rd RMS value Current | | | | 0 | 0 | 0 | 0 | 5th RMS value Current | | | |

| 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7th RMS value Current | | | | 9th RMS value Current | | | | 11th RMS value Current | | | | 13th RMS value Current | | | |

| 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 15th RMS value Current | | | | 3rd content rate Current | | | | 0 | 0 | 0 | 0 | 5th content rate Current | | | |

| 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7th content rate Current | | | | 9th content rate Current | | | | 11th content rate Current | | | | 13th content rate Current | | | |

| 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 | 91 | 92 | 93 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 15th content rate Current | | | | CT ratio | | | | ETX | Checksum | | CR |

## 19. Frame details, All data 4 (Voltage harmonics : Instantaneous maximum value between each phase / line) <Excluding single-phase 2-wire>

Host side → QT2-500

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ENQ | Address | | 2 | 3 | #6 | | #5 | | #4 | | #3 | | #2 | | #1 | | Checksum | | CR |

The data specified by the transmission bit (see page 13) is transmitted.

QT2-500 ⟶ Host side

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| STX | Address | | A | 3 | Fundamental RMS value Voltage | | | | 5th conversion RMS value Voltage | | | | Distortion factor Voltage | | | |

| 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5th conversion content rate, Voltage | | | | 3rd RMS value Voltage | | | | 0 | 0 | 0 | 0 | 5th RMS value Voltage | | | |

| 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7th RMS value Voltage | | | | 9th RMS value Voltage | | | | 11th RMS value Voltage | | | | 13th RMS value Voltage | | | |

| 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 15th RMS value Voltage | | | | 3rd content rate Voltage | | | | 0 | 0 | 0 | 0 | 5th content rate Voltage | | | |

| 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7th content rate Voltage | | | | 9th content rate Voltage | | | | 11th content rate Voltage | | | | 13th content rate Voltage | | | |

| 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 | 91 | 92 | 93 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 15th content rate Voltage | | | | VT ratio | | | | ETX | Checksum | | CR |

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